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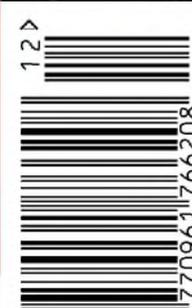
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Paul Rigby, Jon Myles, Martin Pipe, David Tutt



Spendor have a great reputation for building loudspeakers that offer a sound not quite like any other. Born from a tradition of technical accuracy demanded by the BBC long ago, they've continued to use a sober 'feet on the ground' approach to loudspeaker design that holds up well today. Where so many other manufacturers like to use metal cones for their fast but – inevitably

– metallic sound, Spendor continue to use EP77 damped polymer cones that lack the zing – but offer the information. Couple this with advanced bass damping techniques able to deliver deep subsonics and the Spendor D9 looks special. Find out more about it in our review by Jon Myles on p10.

You can't buy them, you can't use them – you can only dream about them. Dreams are different from reality though, warns Dave Tutt in another fascinating insight into the professional open-reel analogue tape recorder on p59. I'm wrong of course, you can buy them, second hand – restored or unrestored – but this market is for audiophiles with deep pockets. You can't buy new professional analogue tape recorders – at least, not quite yet.

I suspect open-reel analogue tape recorders might be a future retro-revival niche though; Technics are about to launch a stunning looking SP-10R Direct Drive turntable and are getting right back behind analogue audio with serious product. Will they or others suddenly announce the introduction of a professional open-reel tape recorder aimed at music studios around the world – oh, and with a spin-off model for the home? I sense that open-reel is about to kick open its coffin lid and step out in new form. When it does we will be there taking pictures, applying a few measurements and telling you about how good high-resolution analogue can sound.

High-resolution analogue was expensive stuff confined to big studios and broadcasting organisations until digital took over. It is far less expensive now for everyday audiophiles – people who would just like to hear what is really on an analogue LP, rather than suffer a mangled version. Audio Technica recently introduced a range of hi-end pickup cartridges – the 700 Series – able to do just that, using sophisticated stylus tip shapes. Our review on p84 and following Feature explain how today's modern pickup cartridges bring you high-resolution from LP. I hope you enjoy what we bring you in another issue that combines the old with the new – and the old that is new!

Noel Keywood

Editor

testing (see 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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Tellurium Q®

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



Introducing our new Black II Speaker Cable

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

John Myles, HiFi World

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

Jeff Dorgay, Tone Audio

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

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NAD TURNTABLE

NAD Electronics continues to celebrate its 45th anniversary with the new C558 turntable. The deck features a belt-drive glass platter with a 22cm tonearm and Ortofon OM10 cartridge. The price is a reasonable £449.

The company has also announced a new entry-level integrated amplifier in the shape of the C328 – offering 50 Watts per channel of Class D amplification with two line-level inputs, as well as optical and coaxial digital, plus an MM phono-stage and Bluetooth connectivity. All this for an estimated £500 when it goes on sale later this year.



DIAMOND LIFE

Japanese cartridge maker Transfiguration has produced a special limited edition of its flagship Proteus moving coil model. Hand-crafted in Japan by Immutable Music's Seiji Yoshioka, 'The Proteus D' features a diamond cantilever, a patented yokeless double-ring-magnet design and exceptionally pure (99.9997%) 5N silver wire coils positioned right at the focal point of the magnetic flux field.

The cartridge is available now priced at £6,750. Go to www.decentaudio.co.uk for further information.



McINTOSH AMPLIFIER

Legendary American manufacturer McIntosh continues to roll out new products – the latest being its smallest solid-state integrated.

The MA5300 offers 100 Watts per channel of power as well as featuring digital inputs, balanced and unbalanced analogue connections as well as a Moving Magnet phono stage. It also features the iconic McIntosh design with two blue power meters and a glass fascia. The price is £6,750 and the amplifier should be in the shops now.

For more information visit the website of McIntosh's UK distributor Jordan Acoustics at www.jordanacoustics.com.



KEF JOINS PORSCHE

Think of Porsche and you'll probably think of cars. But how about headphones? Well, the brand has now joined forces with KEF to produce a pair of noise-cancelling active Bluetooth headphones.

The Space One Wireless set features the Porsche Design logo on the earcups (naturally), Bluetooth aptX connectivity together with 40mm full-range drivers containing large 20mm neodymium magnets.

Battery life is an estimated 30 hours and they retail for £349 - which is a lot less than a Porsche 911 Carrera. For more information visit uk.kef.com/porsche-design.



FOCAL FLAX

From France comes a new loudspeaker by Focal – partner of British brand Naim. The Kanta No2 (which suggests there might well be a No1 and No3 coming) features Flax midrange and bass drivers allied to a Beryllium tweeter, all housed in a damped, curved cabinet featuring a front-firing reflex port.

It's the first time Focal has combined its Flax drivers with the Beryllium tweeter – used in the likes of its flagship Utopia loudspeakers.

The baffle is constructed from a high-density polymer material that Focal claim offers a much better performance than MDF.

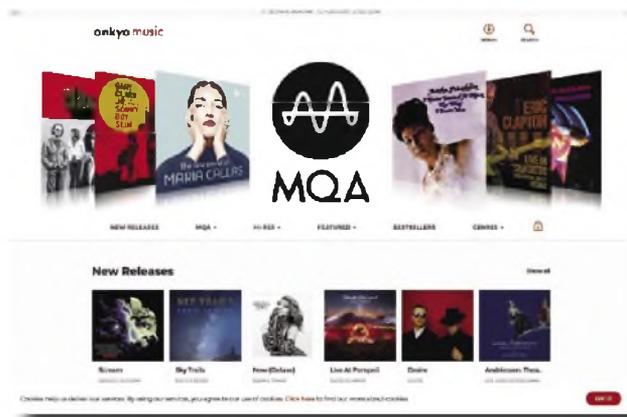
They certainly look good – especially with a range of different finishes. As for sound quality – look out for our forthcoming review.

ONKYO UPDATE

High-resolution download service Onkyo Music has revamped its site with a number of new features.

Improvements include a cleaner, faster interface, better filtering and sorting across different pages, and automatic flagging when files are available in the MQA format. Onkyo Music says it is now one of the largest sources of MQA downloads in the world with more than 16,000 tracks available.

It also says more improvements to the site will follow in the next few months including the ability to purchase via PayPal and Amex.



KLIPSCH HERITAGE

Venerable American loudspeaker manufacturer Klipsch (they've been going since 1946) has announced what it claims is its best ever set of headphones.

The Heritage HP-3 over-ears feature wooden ear cups, removable sheepskin ear pads as well as a hand-stitched cowhide headband. They use 52mm biodynamic drivers said to deliver a sound comparable to the company's best loudspeakers. Log-on to www.klipsch.co.uk for more information.

GOOGLE BUDS

Not content with ruling the internet, Google is now moving into audio. Their new Pixel Buds are designed to rival Apple's AirPods, being a pair of wireless Bluetooth in-ears for use with smartphones.

Control is achieved through a disc on the right earbud – simply tap to play or pause and swipe forwards to turn up the volume or backwards to turn it down.

They should be out in the UK shortly with price still to be announced.



KEYMAIL QUALITY

With Amazon increasingly dominating the on-line ordering of CDs and vinyl, it's nice to discover a site run by real music enthusiasts.

So say hello to KeyMailOrder – an on-line retailer with a vast range of CDs and vinyl, plus a personal touch to their service.

The site includes a weekly update list of new releases and recommendations, a telephone ordering service plus – one of its best features – the offer of trying to source desired titles if they are not in stock. Best of all, the site eschews genre definitions – meaning every visit is a journey of musical discovery that pays dividends. Definitely worth a visit at keymailorder.com or +44 (0) 1276 686360 for boosting your collection and discovering new music.

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EAR BUDDY

Small, cheap and quite effective. The Ear Buddy from iFi attenuates the volume control of portable devices such as iPhones and Android smartphones.

Why? Well, many people don't realise that digital volume controls can actually reduce bit rate at lower volumes. The Ear Buddy avoids this by allowing the player to be turned up without becoming excessively loud in the ears. At just £20 it's worth a listen. Log-on to www.ifi-audio.com for more information.



CHORD CASE

Looking to purchase Chord's new Hugo 2 portable DAC/headphone amplifier but want to keep it safe from knocks and bumps? Now you can as the Kent-based company has launched a luxury leather case for the product.

Priced at £125, the case has been styled by Chord Electronics' founder John Franks and Fumi Higashi San of VanNuys Inc. and is exclusively manufactured in Tokyo.

It features high-quality black-finished leather with red stitching and offers a snug fit while giving full access to all the controls and inputs. More information is available at www.chordelectronics.com. See page 35 for Noel Keywood's review of the Hugo 2.

HEAVEN 7

Huddersfield-based MCRU has launched its latest range of cables – the 7 series.

They use the latest materials including a newly-designed ultra-pure copper formulation as well as pure silver cable from Japan.

The range includes power leads, stereo interconnects, digital and loudspeaker cables. The range starts at £95 for the No 75 power lead. For a full price list go to www.mcru.com.



NURAPHONE 'PHONES

Stuck between choosing a pair of in-ear or over-ear headphones? No need to worry – Australian company Nura has the answer.

Their Nuraphones combine an earbud to handle the mid and treble frequencies while the bass is handled by an over-ear driver.

What's more Nura say the 'phones can measure your hearing profile via an Android and iOS app and tailor the sound to suit your taste.

They offer 20 hours of wireless aptX Bluetooth playback and also feature a 3.5mm input and USB socket for playback and charging. They cost £350 and you can find out more at www.nuraphone.com.



Hey, Big Spendor

Spendor's new D9 loudspeaker offers a big, refined sound that enthralled Jon Myles.

Spendor are one of the most renowned names in British hi-fi due the company's heritage and range of loudspeakers respected for their sound. But they are not ones to introduce something on a whim, preferring to wait, work away and refine until they are sure a new product is truly better and class leading.

So, when MD Philip Swift telephoned and asked Hi-Fi World to take an exclusive listen to Spendor's new D9 floorstander we were more than interested. Even more so when the loudspeakers were delivered by Phil himself. Standing just over 3.7 feet tall they are imposing in height - but have a relatively slim profile, being just 8 inches wide.

Within this cabinet Spendor have engineered a three-way, four driver configuration with a special rear port configuration to boost low-frequency response.

The two bass drivers are Kevlar composite assemblies housed in their own enclosure. This is ported at the back via a down-firing aperture which uses an aerodynamically-shaped central baffle to smooth airflow. It sounds



complicated but it works (see Measured Performance for more details).

Above the bass units sit the tweeter and mid-range unit. The former is Spondor's latest LPZ tweeter which is built around a stainless front plate that forms a damped acoustic chamber in front of a lightweight woven polyamide diaphragm. The idea is to create a balanced pressure environment so the tweeter always operates in a linear mode.

The mid-range driver - that sits at the top of the cabinet - is Spondor's latest EP77 polymer cone and one I've always found smooth and warm yet not short of detail. On the rear are a single pair of binding posts (no bi-wiring here) above that aforementioned port - which Spondor say eliminates noise and enables the D9 to produce fast, clean, articulate bass.

As ever, Spondor use substantial internal bracing as well as polymer damping that converts acoustic energy into heat to eliminate internal standing waves in the cabinet, controlling resonances.

Put together it makes the new D9 a tall loudspeaker but rather slim; it looks elegant and would easily fit into any medium-sized room or above. A variety of finishes are available, with prices starting at £6995 and rising to £7995 depending on which one you choose.

There's no doubting that at the price you are getting a lot of loudspeaker for the money and it certainly looks imposing and purposeful with the grilles off to show those four drive units. But, as ever, it's the sound that matters.

SOUND QUALITY

The D9s have good sensitivity so don't need masses of power to go loud. That said I still pressed a Devialet Expert Pro 220 into service (more of which later) but also used an Icon Audio Stereo 30 SE valve amplifier. Connection was courtesy of Tellurium Q's Black 2 'speaker cables.

Philip Swift had suggested positioning the loudspeakers with a slight toe-in - which was how I started the listening.

However, playing Oasis's classic 'Definitely Maybe' debut on CD it was quickly clear the treble was just a little too prominent for my liking. Admittedly, this isn't the smoothest of albums with a raucous bite to the top end but the Spondors seemed to



The D9s have a proprietary rear reflex port with a central baffle to direct airflow.

accentuate this.

Adjusting positioning so the D9s pointed straight down the room solved the problem, taming their top end. Now I could really hear what these loudspeakers can do and the results became even more impressive as time went on.

First off they are extremely clean-sounding, especially in the lower registers. And they do go very low indeed - going below 20Hz so capable of producing club-like subsonics with the right material. With The Chemical Brothers' 'Block Rockin' Beats' bass hit me in the chest with its power nearly knocking me off my seat when I turned the volume up on our Icon

Audio amplifier. The D9s made the amplifier's 30 Watts of power sound much, much more.

But allied with acoustic power they are also very well controlled. They don't sound flabby or boomy but are possessed of a fulsome, tuneful bass that if anything errs on the dry side. There was no artificial warmth to it, instead just a refreshing tonal accuracy.

It's a trait evidenced with my favourite test track - James Blake's 'Limit To Your Love'. This piece really tests a loudspeaker's frequency response with rumbling sub-sonics, delicate piano and Blake's keening vocals above. It's a combination not all 'speakers can handle and knit together into a coherent whole, many making elements of the music divorced from one another.

But the D9s made it sound better than on any other loudspeaker I've heard at this price. Piano was sparkling, Blake's voice plaintive and anchored firmly between and just above the cabinets - and when the bass kicked in it was truly room-shaking. Yet those low octaves didn't mask what was going on above. They came in like a sledgehammer but started and stopped with no overhang or interference from the cabinets.

There's no doubt the D9's rear port makes a big difference here. It helps these 'speakers go deeper but without the inherent problems of more basic reflex designs where an artificial bass boost can be evident. Here there is no such artificiality.



The mid-range unit uses Spondor's latest EP77 polymer construction that gives a damped natural sound, free of metallic cone hardness.

Questyle

Audio Engineering



CMA600i - amplifier/DAC



CMA800i - amplifier/DAC



CMA800P - preamplifier
CAS192D - DAC
CMA800R - amplifier



CMA800PG - preamplifier
CAS192DG - DAC
CMA800RG - amplifier



And with the new QP2R DAP on the move too!



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Questyle's award winning and patented 'Current Mode Amplification' is common throughout their range

The Golden Series stack represents the pinnacle of fully balanced headphone listening.

Now, with the **CMA400i DAC and amplifier**, experience exceptional audio quality at a very affordable price.

The D9s exhibit good timing and tempo. They are remarkably agile – especially for a large loudspeaker. With Michael Gandolfi's 'The Garden Of Cosmic Speculation' (Atlanta Symphony Orchestra SACD) the farrago of tonal styles - baroque, minimalism, jazz and even elements of hip-hop, wove together beautifully.

Soundstage was also wide with a glorious spread across the room. With Pink Floyd's 'Dark Side Of The Moon' (24/96) the sound was immersive and enveloping - effects sweeping from left to right and extending close to the walls of the listening room. The ringing clocks at

correct.

The Spendor D9 is one very well-engineered loudspeaker indeed. It offers prodigious but controlled bass, detailed treble and a nice clean midband. All these combine seamlessly so you wouldn't know you were listening to four drivers. Add in superb construction (Spendor have their own cabinet-building facility in Sheffield) and you have an exceptionally impressive floorstanding loudspeaker. I've heard much more expensive loudspeakers that do less.

CONCLUSION

Spendor traditionally make good loudspeakers and the D9 is one of

their best yet. It is big-sounding with great bass but supremely natural and free-flowing. This is one for those who like to hear music as it should be.



A closer look at the reflex port with its aerodynamically-shaped baffle that helps smooth output, providing clean deep bass.



The LPZ tweeter employs a stainless steel front plate with a light weight diaphragm behind.

the start of 'Time' were striking - the D9's tweeter giving them startling reality.

Taking out the Icon Audio and connecting the 'speakers to the Devialet Expert Pro 220 proved interesting. Especially when tuning the amplifier's SAM (Speaker Active Matching) technology. Essentially this is a DSP feature that corrects phase and time domain errors induced by the design of the loudspeakers to produce a cleaner sound. Spendor believes the system works and a number of their 'speakers have been mapped by Devialet.

With Massive Attack's 'Angel' bass output - good without SAM on - went that hit lower with it on. Voices and acoustic instruments also had an extra lifelike quality to them. It wasn't a vast difference and I have heard SAM have more effect on other, less expensive 'speakers. Which leads me to think that the better engineered a loudspeaker is the less SAM has to

MEASURED PERFORMANCE

Spendor's D9 has a big cabinet with a large, rectangular floor level port at rear, fitted with profiled flow control vents – unusual. Port output was also unusual in being broad and untuned (no peaking). The twin bass units, large cabinet volume and unusual port venting scheme extend bass smoothly down to a low 35Hz, whilst the port provides support lower down, to below 20Hz our red port output trace shows. The impedance analysis correspondingly shows broad bass damping, centring around a low

25Hz. All of which tells of a big cabinet that goes very low and will provide very deep yet also well controlled bass. This is a loudspeaker that will produce subsonics of some force.

A roll-down in output below 300Hz will remove any sense of fulsome-ness, a dry lower midband being likely and perhaps some divorce from lower frequencies apparent in smaller boomy rooms.

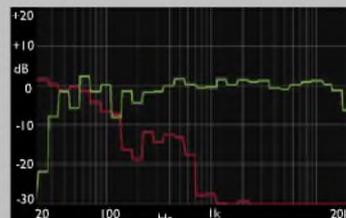
Measured on-axis tweeter output was raised by +2dB or so – enough to give obviously strong treble and a bright sound balance. Off-axis our response analysis shows a more even tonal balance so the D9 is best pointed straight down a room and not directly at listeners. Strong output in a band from 2kHz to 3kHz will make detail very obvious.

Sensitivity was good at 87dB from one nominal Watt (2.8V) of input, if not quite up with others of the cabinet size that manage close to 90dB. However, the big D9 still needs no more than 60 Watts to go extremely loud; more power is unnecessary.

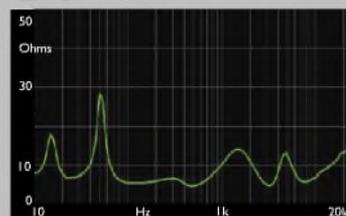
The D9 will have powerful low bass that is controlled and tuneful. It will not have a warm sound balance overall however, likely sounding dry and forcefully detailed. **NK**

FREQUENCY RESPONSE

*Green - driver output
Red - port output*



IMPEDANCE



SPENDOR D9
£6995



OUTSTANDING - amongst the best.

VERDICT

Spendor has excelled itself with the new D9. Deep, controlled bass allied to a detailed treble bring the best out of whatever you play. Highly recommended.

FOR

- bass output
- detailed treble
- smooth midband
- quality construction

AGAINST

- not overly warm

Spendor Audio Systems
+44 (0)1323 843474
www.spendoraudio.com

Southern Exposure

Good things come from small (but robust) packages, as Martin Pipe discovers with the Exposure XM5 integrated amplifier.

Based in West Sussex, Exposure made a name for itself in the 1980s with its well-engineered pre-power amp combos. Minimalist in nature and solid-state in design, these British-through-and-through audiophile contenders were seen as punchy yet more affordable alternatives to the Naim products that were then in vogue. Exposure continues to indulge those in the market for separate pre-amps and power-amps but the south-coast firm does a good line of integrations too.

Here, I'm examining the half-width (admittedly, it is quite deep!) XM5. It will cater for sources both

past and present; there are two line inputs for tuners and tape (no 'loop' though!) while its built-in phono stage will accommodate MM cartridges. One of the line inputs is fixed-level (i.e. the volume control has no effect), being intended for integration of the XM5 into AV systems. With digital sources the XM5 generously gives you asynchronous USB capability (realised with XMOS interface circuitry), plus two optical and two coaxial S/PDIF inputs. The latter employ high-quality locking BNC connectors; Exposure's chief designer Tony Brady told me they are "75 ohms and a much better match than RCA (phono) – Exposure CD players use BNC as well". If you

don't have an Exposure CD player, though, you'll probably need an adaptor.

The internal DAC is, Tony explained, basically a "cut-down 2010S2 DSD DAC". Press that USB port into service (the XMOS drivers for Windows PCs are supplied on CD-ROM) and with the appropriate software (I used the free Foobar2000, appropriately-configured) one can enjoy DSD files. The Wolfson WM8742 DAC chip at the heart of Exposure's digital goodness can handle DSD natively, as well as PCM-derived content as dense as 24bit/192kHz. Unfortunately, only DSD64 content can be played; in practical terms, this meant I could



play my Alan Parsons 'I, Robot' tracks – but not Robert Len's DSD128-encoded 'Hope'. Competing products will support this, and sometimes DSD256 too. The XM5 has no Bluetooth wireless link for smartphone playback.

And outputs? Exposure has specified recessed speaker terminals, that accept standard banana plugs only – no bare wire here! You also get line-level phono outputs, the signals from which are processed by the volume control, for an external power amp – handy if you want to bi-amp your speakers. Note, however, that the XM5 is 'speakers-only'; it lacks a headphone socket. That aside, the it is flexible – and easy to use in a 'no-nonsense' sort of way. The only user controls are power, source selection (a pair of buttons sequence through the inputs, the active one being indicated by a LED) and volume. A high-quality ALPS pot is used for the latter. It's motorised – a rather cheap-looking handset will change volume or source, as well as operate Exposure CD players. It also engages a relay-driven 'mute' function.

Internally, we find a busy design that is basically in two halves – analogue and digital. At the bottom lurks the amplifier proper, together with power supply circuitry and the phono stage. The Class AB power amp, which is rated at 60 watts per channel (1kHz, 8 ohms) employs



Exposure's neat but busy internal construction. The XM5's amplifier section is on the bottom, while the digital electronics occupy the top board. Both rely on the 200VA toroidal transformer that dominates the rear of the unit. In terms of running temperatures, the XM5 gave me no cause for concern.

Toshiba output transistors. That integrated MM-only phono stage is a basic one that has little in common with the sophisticated MC/MM XM3 announced by Exposure at the same time. Exposure included it to accommodate the resurgence of interest in vinyl – or, in its own words, "bring the good old days of vinyl bang up-to-date". The stage is of similar capability to what you'd find in a pre-CD integrated. Mounted above the amp section is the digital board, which contains the DAC and control

circuitry. Audiophile-grade components are evident in the signal stages of both boards. Elsewhere in the 5kg XM5 are the motorised volume control, and the linear power supply's 200VA toroidal transformer. The XM5 may be well-packed, but it's well-built and runs surprisingly cool.

SOUND QUALITY

Sources included a USB-interfaced Windows 7 PC, Cambridge CXN streamer, a Rega Planar 3/RB300/Bias record-playing system and Humax FVP-500T set-top box, my speakers being Quadral Aurum Wotan VIII

floorstanders. My PC runs the free Foobar2000 audio player, but the USB installation instructions (a single-page PDF on the CD-ROM) don't explain how this – and competing software – can be configured for best results. Indeed, there's nothing about DSD-over-PCM; follow the instructions, and you'll be listening to everything via PCM.

As a result your computer, rather than the XM5, will be doing the DSD decoding – there's no front-panel means of confirming digital-audio mode (sampling rate, resolution), and so you're working 'in the dark'! Luckily, I have plenty of experience working with Foobar2000 – and was able to check correct DSD operation merely through listening, and the simple fact that incompatible (DSD128 and above) tracks are rejected by correctly-configured player software. If you're in any doubt, though, your dealer should be able to help. Serious listening can then begin – after the recommended 48-hour 'burning-in' period.

As it is DSD playback is certainly worthwhile, and the aforementioned DSD64 transfer of I, Robot was imbued with presence and warmth. The XM5 certainly didn't miss a trick when it comes to Alan Parsons' famous attention to detail, in terms of production and the playing of his



This motorised ALPS volume control is just one of the numerous audiophile-grade components that helps the XM5 work its musical magic. Note too the high-grade printed circuit board – which is made of fibre-glass, rather than the bonded-paper of cheaper products



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musicians.

I then switched to a PCM hi-res performance of Grieg's familiar Concerto for Piano and Orchestra in A minor (Symphonieorchester des Bayerischen Rundfunks/Alice Sarah Ott/Esä-Pekka Salonen, DG, 24/96). I immediately got the young pianist's interpretation of this work, such is the degree of communication available. Imaging is superb, and between my speakers I could appreciate the acoustic of the recording venue (Munich's Herkulesaal). The dynamic swings of the orchestra easily fell within the XM5's grasp, no hardness being evident even during the dramatic third movement. Tonally speaking, presentation is full-bodied yet natural. On first hearing, it sounds a little bright - but what you're hearing is genuine upper-register musical detail, as opposed to the falsehood of an imaginary treble control.

But what about 16-bit material - such as the atmospheric title track of London Grammar's *If You Wait?* Hannah Reid's emotionally-charged singing voice is here sublime, listening being rewarded with a genuine sense of intimacy. Such compelling 'presence' joins forces with a tonal presentation that ensures the accompanying strings actually sound like strings, and not caricatures thereof. Reproduction of the bassline in *Hey Now*, from the same album, is simply superb - the XM5 goes satisfyingly-deep without losing control. In this respect, it gets subjectively close to my reference Arcam A49 - a considerably more expensive machine.

With vinyl, you get similar levels of communication - the clavichord and orgasmic vocal of Space's *Carry On, Turn Me on* (Pye LP), and the rhythm guitar and energetic percussion of Freeez's *Southern Freeez* (Beggars' Banquet 12in. single) being cases in point. But the low-end is alas not prominent, likely due to the warp filter. It was detailed and taut - I could easily follow the synth bass of the first, and the bass-guitar of the second - but LP was somewhat lacking in the 'punch' that the amplifier is capable of.

CONCLUSION

I thoroughly enjoyed my time with the XM5. In feature terms, it's rather basic - number of inputs apart - but it's capable of a remarkably musically-engaging performance - and a flexible one too. Try one for...size!



Plenty of connectivity, given the limited rear-panel real-estate. BNC sockets (D1, D3) accept S/PDIF digital for more accurate termination. Loudspeaker sockets accept 4mm plugs alone.

MEASURED PERFORMANCE

The Exposure XM5 produced 72 Watts into 8 Ohms and 121 Watts into 4 Ohms, more than enough for very high volume. The power supply has good regulation; it offers a lot of 'push'. Distortion was low at all frequencies and levels, just 0.02% at 10kHz and less at 1kHz - a fine Class A/B amp.

The internal MM phono stage had a high sensitivity of 3mV so will accept all MMs and high output MCs purposed for MM inputs. Overload was very high at 70mV - more than enough for all cartridges. It reached down to 25Hz (-1dB) before rolling down to -10dB at 5Hz to suppress LP warps.

Frequency response of the main amplifier via the Aux input has been curtailed, rolling off above 26kHz (-1dB) to give an easy sound.

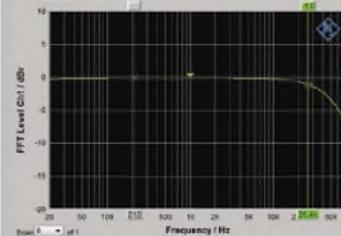
The digital (S/PDIF) input gave a respectable 111dB dynamic range (24bit) - 117dB is common nowadays

in such a product. Distortion with hi-res (24bit) was low at 0.06%, and with CD the usual 0.2% due to 16bit quantisation noise. This input also has curtailed frequency response, output rolling down above 20kHz. The optical input accepted 176.4kHz sample rate maximum from a QED glass optical cable; the electrical (BNC socket) input accepted 192kHz.

The USB input had slightly less dynamic range than S/PDIF which is unusual nowadays, measuring 107dB due to a small amount of noise. Distortion was low at 0.06% at -60dB with 24bit and 0.2% with CD. Again, frequency response was curtailed, reaching 23kHz (-1dB) due to the main amplifier's low limit.

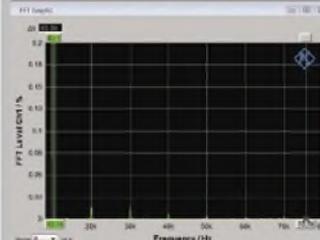
The XM5 is a carefully tailored amplifier that has been designed to give a big, smooth sound through all inputs. It measured well in all areas, and whilst not giving class leading digital figures it will still sound less bright than most rivals and likely very relaxed - as well as punchy. **NK**

FREQUENCY RESPONSE



DISTORTION

Input	THD (%)	Level (V)	Frequency (kHz)
01	0.0231	2.8126	10.000
02	OFF	OFF	OFF



Power (8 Ohms)	72W
Frequency response (-1dB) 7Hz-26kHz	
Distortion (10k, 1W, 4 Ohms)	0.02%
Sensitivity	400mV
Noise	-104dB
PHONO	
Frequency response	25Hz- 20kHz
Distortion	0.02%
Separation	82dB
Noise	-77dB
Sensitivity	3mV
Overload	70mV
DIGITAL (S/PDIF/USB)	
Frequency response	7Hz- 26kHz
Distortion (24bit, -60dB)	0.06%
Separation	90dB
Dynamic range (S/PDIF/USB)	111/107dB
Noise	-109dB

EXPOSURE XM5

£1,236



OUTSTANDING - amongst the best

VALUE - keenly priced

VERDICT

The XM5 punches way above its weight (and pricetag) with a performance that will do justice to decent sources, new and old alike.

FOR

- input versatility
- detailed, smooth sound
- small size

AGAINST

- no headphone socket
- DSD64 only via USB
- vinyl lacks bass depth

Exposure
www.exposurehifi.com

Indulgence Show 2017

A warm September end made visiting the Indulgence Show, Hammersmith, West London, easy going. It housed three floors of audio, plus a few other bits on the ground floor: one motorcycle, one car, food and drink stands and LPs, CDs and what have you. Here are some highlights for you.



Indulgence Show entrance at the Novotel, Hammersmith, West London. An easy place to reach by public transport and car, with parking beneath the hotel.

KEF were showing their new Q Series range – and here is the compact Q550 floor stander. It has their unique co-axial UniQ drive unit at top that incorporates a central tweeter, accompanied below by a bass unit flanked by twin Auxiliary Bass Radiators (ABRs) instead of the usual bass port. KEF told us they had worked hard to ensure excellent bass quality.



Audio Technica were playing their extraordinary ART1000 moving coil pickup cartridge. Its miniature sensing coils sit right at the stylus tip – not at the end of a cantilever. Hand built, there are few available and they are, naturally, expensive. I was told that getting rid of loss down the cantilever makes a dramatic difference to the sound – so we still have a way to go to get the best from LP it would seem.

It's a 705.6kHz sample rate CD player – or is it? Chord Electronics continue to baffle us all with things that defy description – and here's one of their latest, the Blu MkII M Scaler. It not only upscales CD 16 times, but also acts as a stand alone DAC that works up to 768kHz. Looks good too, and is wonderfully built and finished.





The Metaxas room was a spectacle, graced by alien shaped loudspeakers set in an eerie purple glow, and fed by music from a Nagra T open reel recorder. It was intriguing and the master tapes sounded good.



Dynaudio were showing their new wireless speaker range offering multi-room functionality with the ability to add more as you need. They also sounded rather good.



Here's a loudspeaker to catch the eye: Yamaha's new NS-5000, a spiritual successor to their much admired NS-1000M that used a beryllium midrange dome drive unit. The NS-5000 uses Zylon synthetic fibre domes coated with a 'Monel' alloy, Yamaha say, to avoid the resonances domes commonly suffer. They are accompanied by a 12in bass unit, just as before. Impressive!



New UK company 3 Square Audio had a pair of its Translator floorstanders on demonstration. They are constructed using bespoke Birchwood cabinets and employ a first order crossover. At £2800 they sounded very smooth and refined.

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The Right Chord

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

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

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

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

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

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

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



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

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

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

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

(1/4in) jack sockets for headphones.

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

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

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

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



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

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

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

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

SOUND QUALITY

Hugo 2 has internals no other DAC has – and it sounds like it. 'Different' is the word. Pressing the Play button on my Astell&Kern AKI20 portable digital player, connected in optically, Hugo 2 raced off the line with Fleetwood Mac's 'Go Your Own Way' (24/96). Mick Fleetwood's bass line was resolved conspicuously well in terms speed and drums were firm and powerful centre stage: Hugo 2 comes over as fast paced – and super sharp in its timing. Almost weird to hear music speeded up, for that is what Hugo 2 seemed to do with this up-tempo track.

A selection of hi-resolution



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



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

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

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

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

Fidelio XI headphones).

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

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

CONCLUSION

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

MEASURED PERFORMANCE

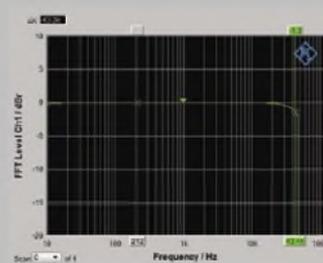
The optical digital S/PDIF input (via a QED glass optical cable) worked to 192kHz, as did the electrical input. Frequency response with a 192kHz sample rate signal reached 43kHz before rolling away to the theoretical upper frequency limit of 96kHz, as our analysis shows, this being achieved with either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

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

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

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

FREQUENCY RESPONSE



DISTORTION



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

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

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

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

Frequency response (filter white)

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

CHORD ELECTRONICS HUGO 2 DAC £1750



OUTSTANDING - amongst the best

VERDICT

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

FOR

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

AGAINST

- lacks warmth
- ineffective filters
- cheap mains supply

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Mail



Visit our website at www.hi-fiworld.co.uk or send your emails to letters@hi-fiworld.co.uk. Letter of the month wins a pair of Quadral's Rhodium 200 loudspeakers.

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

LETTER OF THE MONTH PRIZE



QUADRAL RHODIUM 200

www.quadral.com/en/loudspeaker/rhodium-200

For more advice see Letters from earlier issues at www.hi-fiworld.co.uk/letters

A pair of QUADRAL RHODIUM 200 loudspeakers are on their way to EDWARD MARTIN, Letter of the Month winner in our November 2017 issue.

Letter of the Month

CABLE REVIEWS

Your cable reviews have troubled me for some time but now you've gone too far! John Myles's review of a pair of 1.5m long loudspeaker cables costing £1800 (Nov 2017) found quite a lot 'for' and nothing 'against'. He did not mention how much I would have to pay to buy a pair of these cables long enough to actually reach my loudspeakers (10mtrs) but presumably they would cost more than my entire hi-fi system. Also, he appears to have only tested the cables with Naim amplifiers and his review did not even mention what loudspeakers were used.

I have no particular axe to grind in the argument about the effects cables can have on sound. When I built a World Designs KEL84 amplifier I bought the XL model with Soniqs silver input wiring. I found the sound beautifully clear but too bright. Changing to the microphone cable used in the standard version removed the glare but was a little dull and a good quality Maplin signal cable gave a happy medium. I was astonished at how much effect half a metre of signal cable could have on the sound of an amplifier.

However, when I bought a World Designs WD88XL, I found that although this used the same Soniqs silver cable,



Loudspeaker cables - always a contentious subject. "But now you've gone too far" says Alasdair Beal.

there was none of the excessive brightness which had troubled me in the KEL84. Matthew Snell of World Designs has repeated this test and confirmed the result. It seems that the electrical characteristics of the cables interact with amplifiers in different ways and the WD88 is much less sensitive to this than the KEL84. It is not a simple case of silver cable = better, copper cable = worse, or silver cable = bright sound, copper cable = mellow sound. I suspect that the same may well be true of other combinations of cables and equipment.

A full investigation of the electrical characteristics of cables and their interaction with various different items of partnering equipment is probably too much to ask, but a little more scientific rigour would be welcome in cable reviews. If someone is thinking of spending £1800 on some very short loudspeaker cables he/she needs more than just a description of how they sound when used to connect a Naim amplifier to some unspecified loudspeakers.

How about this as a minimum for future loudspeaker cable reviews?

1 Always state the type of amplifier and loudspeaker used and where possible use realistic lengths of cable (i.e. at least 5m) 2 Use a good quality standard cable as a reference for comparison (e.g. Van Damme 2.5mm HiFi Series LC OFC cable, available from Maplin at 4.49/metre) 3 Always try the test cable with at least two different types of amplifier (e.g. one valve, one transistor, maybe one Class AB, one class A) and at least two different types of loudspeaker (e.g. one low impedance/efficiency, one high impedance/efficiency), to check whether the cable has the same effects on the sound in all cases. If you do this we can get a clearer idea of what different cables are doing and how they interact with different equipment.

Regards,

Alasdair Beal

Hi Alasdair: The Sarum T cables in the review were tested with Naim and McIntosh solid-state amplification as well as an Icon Audio Stereo 30 SE valve amplifier with significantly less power than the others but a lovely smooth sound. Loudspeakers varied between a pair of the new Spender D9s, Piega Classic 7.0s and even budget Acoustic Energy AE100 standmounts. It was evident the basic sound of the cable didn't vary between all the combinations and if it had, it would have been mentioned.

Length of cable is always a problem - what do most people use? In your system it is 10 metres but many others employ 3 metres or less which is why we always give the basic (terminated) price quoted by the manufacturer for the minimum length and then supply their website details so readers can see how much longer lengths would cost them. **JM**

Cables are always difficult but there a couple of things that make them even more odd to sort out. Loudspeaker cables: the shorter the cable the lower the series resistance and therefore the better the amplifier output stage controls the behavior of the speaker. The damping effect of the amp on the speaker is going to be substantially greater if the cable run is short and this in turn gives you changes in bass performance i.e. less overhang and a tighter control, cross-over oddities and as a result changes at the crossover point which can be a very subtle effect.

With valves where there is

almost no damping effect from the amp it's a totally different ball game and the speaker character is very much to the fore.

With interconnects, because they are a screened cable, they have a direct effect on both the output driving the line and the input receiver. The cable is going to look like a tuned line, albeit at a very high frequency - but it will have some effect. Again it is both the equipment and the cable - and some just don't work well together. I have tried all sorts but have found that the diameter tells you a lot about the sound. I am a thick cable person but others may find they prefer - well - others! **DT**

Hi Alasdair - and thank you for a fascinating letter on the ever contentious subject of cables. We could indeed use many amps and 'speakers, but the results would be indeterminate because we could never cover all the variables, some of which Dave Tutt mentions, and then average them to give a statistically meaningful result that may, or may not, be universally applicable.

In addition to a cable's electrical parameters (resistance, inductance, capacitance) there is also RF susceptibility and even microphony to consider. When you then take into account the nature of the interaction

bumps into prodigious technical complexities that are beyond our time, skills and financial ability to cope with. And even if we did measure each cable to death, what you end up with in such a scenario is a mountain of data that then needs interpretation.

We do in practice, as Jon explains, use many loudspeakers and amplifiers, because we are set up to do so in our listening room. On the matter of price, you have to be the judge of whether you can afford it, or not. I am constantly told, most recently by VAC in the USA, that more expensive product can outsell budget if the perceived value is there. That's why people pay for a Bentley I guess. We can't pre-judge your outlook here, as we can't guess your cable length! **NK**

MOVE TO MOVING COIL?

I grew up with vinyl then switched to CD, then back to vinyl and for a very long time back to CD. Then I wandered into HMV and saw all those new LP covers I used to own displayed on the walls - all nice and shiny with no ring wear, just making me reach out for my wallet once again. What I am unable to buy new I have purchased used.

I am very aware many people complain about how some vinyl is mastered from a digital source but this really does not concern me as quite a



An Edwards Elite Audio TT1SE, with modified Rega RB202 tone arm. Mine has "been cut to fit the Jelco 750d 9" tone arm" says Gary Ray. What cartridge to use?

of generator (amplifier) and load (loudspeaker) it all becomes too complex to deal with. It's been suggested we use a Network Analyser, but they cost £60k+, you need to go on a training course to understand them and they only work down to 10kHz.

I mention all this to underline the point that trying to understand what is going on with cables

few of my albums I believe have been mastered correctly (such as The Faces box set, Lou Reed box set and the Beatles stereo box set)

Anyway, I will soon be in charge of an Edwards Audio TT1SE which has been cut to fit the Jelco 750d 9" tone arm and an Ortofon Quintet Red MC cartridge. Amplifier is the Yamaha AS1100 which has a MC/MM phono stage. Speakers are the Proac Tablette

I0 with Tellurium Q Black speaker cables. CD/SACD is a Marantz 8005.

I have not got the record deck yet and can change the cartridge if need be, so my question is: is it worth spending any more on the cartridge or purchasing a separate phono stage? I have only ever had MM cartridges and would like to try MC. My listening position is near field monitoring and I do not have it that loud. Budget approx £750.

Kind Regards

Gary Ray

PS Really enjoy Dave Tutt's articles.

Hi Gary. At £750 my answer to your question is simply "no". Better to save a few bob and go for today's hi-end MMs, meaning one of the deeply impressive Audio Technica 700 Series MM cartridges I review in this issue, or an Ortofon 2M Black. Really good MCs start at around £1000 and matching phono amps also £1000. Budget MCs from Denon and Audio Technica, for example, do have attractive properties, like an open sound and firm bass, but their styli are 'challenged' and commonly sound vague up top. **NK**

AK100II

I wonder if anyone on your magazine or indeed anyone else out in the wider hi-fi world, excuse the pun, can throw some light on a problem I am having. I have an Astell and Kern AK100II and am trying to get an additional microSD card to work in it. I initially bought a 128 GB SDXC card but it gave me an error message 'not enough storage space' when I try to rip a CD to the player. The AK100II seems to know that the card is



Astell&Kern AK100 portable player. "It gave me an error message 'not enough storage space' when I try to rip a CD to the player" says Archie Hunter.



A BBC Radio 3 concert. Orchestras present production problems: "Some performers are just naturally lower in volume than others and prefer different equipment for the broadcast of their performances" the BBC tell Mike Bickley.

installed as it shows the card with all the memory available. After some investigation I found that all SDXC cards use the exFAT file system and it seems that the AK100II uses FAT32. I then bought a 32GB SDHC card that I understand uses FAT32 but still get the same error message. Does anyone know if I am missing something? Hope someone can help.

Archie Hunter

Hi Archie. I suspect this is an issue of data rate. Ripping direct from CD will impose CD's data rate of 1.2Mbps on the path between CD and card, which takes in the USB link. Although not high as a data rate nowadays, and within the bounds of even USB 1 low speed, it may well be beyond what the AK100 can handle in its USB device stack. Rip the CD to a local file, meaning one on your computer, then transfer it to the card. This transaction will then be out of real time and subject to error correction routines.

An alternative is to get an external card reader (Maplins) and transfer music files to the card through that, rather than using the AK100 direct. I have never come across this problem with an AK100 or AK120 but only transfer music locally, I do not rip direct from CD. **NK**

CONCERT SOUND

Back in August I wrote a piece on 'concert sound'. I have had a reply from the BBC with respect to the 4th

paragraph in my e-mail to you. Here it is below.

Regards

Mike Bickley

Dear Mr Bickley. Thank you for contacting us regarding the BBC Radio 3 and online coverage of BBC Proms 2017. I understand that you and a friend noticed a disparity in the sound quality of various broadcasts of the performances.

There are certain challenges with live broadcasting from events of this kind, and it's not always possible to provide an exact answer as to the specific reason for this. Some performers are just naturally lower in volume than others and prefer different equipment for the broadcast of their performances. Another reason may be, technically, capabilities beyond our control, or occasional faults. However without exact details of timing for example, it is only possible to address your complaint generally.

However I hope this hasn't affected your enjoyment of the Proms too much and I can assure you that your valuable feedback is appreciated as it helps us to get a snapshot of your tastes and preferences and will help us shape decisions on future broadcasts from the BBC Proms.

I hope this helps and I can assure you that all complaints are sent to senior management every morning, and I've included your points in our overnight report of

audience reaction.

These reports are among the most widely read sources of feedback in the BBC and ensures that your concerns have been seen by the right people quickly. This helps inform their decisions about current and future programmes.

Thank you once again for taking the time to contact us.

Kind regards

Anna Sweeney
BBC Complaints Team
www.bbc.co.uk/complaints

The BBC response would tally with Noel's reply to your letter in the November issue ("each producer has preferred arrangements. The presentations can be dramatically different"). However, these are performance issues that would be evident to one degree or another on all Radio 3 broadcast platforms.

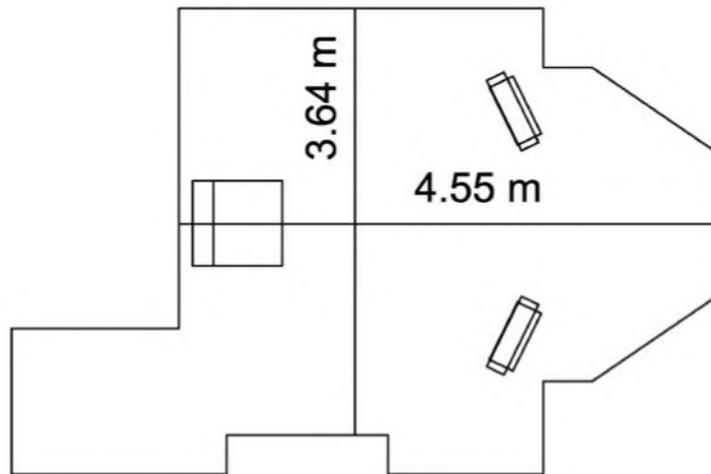
What the complaints team didn't tell you is that the signal paths and pre-broadcast audio signal-processing systems will differ, depending on what you're listening to. In your original letter, you explain that as a "lifelong listener via FM" who was "keen to give this (FLAC) a try, you "concluded that FM is the preferable listening medium for me". Could this be because you're used to the sonic presentation of the FM broadcast?

In 2017 the BBC still uses an archaic digital technology, known as NICAM-3, for the complex distribution networks that shuttle audio from Broadcasting House to its FM transmitters. Recently (see <http://bbc.in/1V8wYJ8>) the original 1983-vintage equipment located at Broadcasting House was updated but your FM BBC radio is nevertheless still reliant on a 14-bit to 10-bit companded system that extends to approximately 16kHz!

Furthermore, audio compression and limiting (that restrict dynamic-range) is employed to prevent the radio signal from going 'out of spec' and potentially causing interference to adjacent FM stations. Radio 3 is nowhere as bad as 'pop' stations in this regard, but processing is applied.

In contrast, the FLAC signal over the internet has 16-bit resolution, up to 24kHz of audio bandwidth, theoretically-infinite channel separation and a much wider dynamic range (I've measured over 60dB, from some Proms concerts). It's amazing that FM sounds as good as it does!

With a PC and Prism Callia DAC feeding an Arcam A49 and



Mike Tartaglia Kershaw's proposed listening room. "I do get low bass in this room, but perhaps it is just harmonics of the test tone?"

Quadral Aurum Wotan VIII speakers, it's my personal opinion that the experimental FLAC stream beat FM (received here with a Pioneer F91 tuner that derived its signals from a rooftop aerial aimed at the Wrotham transmitter) hands down. **MP**

'STATIC ISSUES

We are contemplating building a small extension to our house to provide an en-suite bathroom upstairs and a small study, utility room and cloakroom downstairs. The

emphasis is on small because we are very constrained by the space available. I also want to use the study as a listening room. I attach a plan of the proposed study. The main area measures 3.6 (3.9 into the recesses on each side of the chimney breast) by 3.15 and 2.4 metres high. I have plugged these figures into 'amroc' and this shows firstly that the main area is just below the minimum recommended size for listening, but there is also a bay window not covered by the amroc calculations. The main area does fall within the Bolt Area with good room ratios, but in such a small room a very minor change makes a huge difference in the number and

distribution of modes. For example the 3.6 m length to the chimney breast gives 79 Bonello modes but the 3.9 m length into the alcoves on each side gives only 46 Bonello modes, for just a one foot change, in old money! Room acoustics quickly get complicated, unless you have a pure rectangular room!

Anyway, my dilemma is that I have set my heart on the Martin Logan Electromotion ESL speakers to match up with my Prima Luna Dialogue HP, having heard them at Stone Audio in Poole.



"I have set my heart on the Martin Logan Electromotion ESL speakers to match up with my Prima Luna Dialogue HP, having heard them at Stone Audio in Poole" says Mike Tartaglia Kershaw.

I know you have in-depth, long term experience with the Electromotion ESL and you have advised other readers that ESLs do not work well at short distances in small rooms. On top of this, the HFW review and other reviews note that Electromotion ESL speakers do provide some very low bass, albeit at low level. Amroc gives 47 Hz as the lowest room mode in this room. Does this mean that low bass will not be reproduced at all in this room, or just that it will need a lot of power to produce low bass?

Interestingly our dining room is almost exactly the same size as the proposed study. I have played 10, 20 and 30 Hz test tone files from my PC via an Audiolab Q DAC, Quad 77 amp and Mordaunt Short Aviano 2 speakers (formerly in the HFW 'standards' listing) and I do get low bass in this room, but perhaps it is just harmonics of the test tone?

Am I wasting my time considering using the Prima Luna with Electromotion ESLs in such a small room? If so, can you recommend some stand-mount or small floor-standing speakers with 'ESL type' sound, perhaps the Quad S or Z series? Best wishes,

Mike Tartaglia Kershaw

Hi Mike. You will not sort out your listening room's potential success with Amroc, or the Cara software I once used. Sound patterns in rooms occupy three dimensions and are impossible to display or even understand, as you have found with all those modes in a chimney breast.

Great that you have visited a dealer to actually hear the Electromotion hybrid electrostatic from Martin Logan. I have a pair in my lounge and find them very accommodating of room acoustics. With open panels like this you need to consider placing absorptive surfaces behind the speakers, like curtains, wall rugs or similar – and not glass. None of this can be illuminated by an acoustics programme, so beware of being overly influenced. A room's size is not intrusive at panel frequencies, and the bass bin is modest in output and will not overly excite small-room modes. So I suggest not to worry about room size; listening close to the panel will only sound like listening to electrostatic headphones! Your Prima Luna amplifier and Electromotions are very well suited and both will convey the magic of an electrostatic driven by a valve amplifier in your proposed extension. Below the lowest mode of a room, 47Hz in your case, bass is progressively attenuated



"This Akai Stereo Receiver model AA-1135-that I had been told was last active some 20 years previously, powered up instantly" says Adrian Warwick.

– it does not disappear suddenly and completely. What you get from the Electromotion is bass from a small cabinet. This loudspeaker is all about revelation and coherency; bass is satisfactory but not 'ground shaking' as it were. **NK**

TRIP TO THE TIP

Following on from Martin Pipe's article (Hi-Fi World November 2017) concerning the Sony ST-80F, I remember in the late 1960s clearly and similarly realizing that particular model was beyond my financial reach.

However, in conversation with early morning risers queuing at my local tip recently I was able to acquire what appeared to be a well used piece of golden age Japanese Kit that the owners had decided to dispose of - having opted to "move-on" to more recent equipment. I was told that it had seen much use in a club atmosphere and more recently as a garage entertainment hub. Refusing any offer of payment I recognized its latent potential for further use.

Three hours spent in my garage (removing various small multi-coloured domestic redecoration spots of paint, an assortment of internal cobwebs, insect remains and sundry other unknown bits and dust that had made their way inside) produced a transformation in appearance - but would it work, after running some simple careful electrical checks?

This Akai Stereo Receiver model AA-1135-that I had been told was last active some 20 years previously, powered up instantly, quietly, and cleanly. Inserting my roof mounted FM aerial lead into the back pulled in an FM performance equal to my old valve based Leak Stereo Tuner almost from the same period and still within my current set up. The ease with which it brought my large home built Open Baffles and BCI type clones to life was a revelation.

Having followed this World of Hi-Fi now for some 65 years I conclude that my finest listening moments have always

been courtesy of the radio. I think it is due to the feeling of immediacy that this source engenders and being with others in experiencing a live event.

A question comes to mind. Why do we dump perfectly good (and usually better sounding) working equipment for the latest over-priced bit of digital hardware with its finite life span before it is replaced by yet another incarnation of the same content – at a higher price. Yes – I know the answer to that one – but none of them look as good as this old "free" piece of kit from that golden age when I was a younger and poorer man.

FM radio must not be allowed to die – keep the "stereo light glowing" say I. Thanks and regards,

**Adrian Warwick
Haywards Heath,
West Sussex**

Once you could go to many council-run tips and – for a few pounds – buy electronic items that workers would put aside because they seemed too good for landfill. I came across much vintage hi-fi – including gear that would be quite valuable today – as well as musical instruments, TV sets, VCRs and computer hardware.

On top of this were white-goods (a scandalous proportion of the latter being in 'as new' physical condition), furniture, kitchenware, tools, bicycles and much else besides. Sometimes, the electronic items worked; on other occasions, repair (remember that?) was needed. But you 'saved' something, giving it a new lease of life. Consumerism 0, common-sense 1!

Thanks to austerity though, many councils 'outsourced' their refuse operations to foreign-owned big business to save public money. And the opportunities for enthusiasts or entrepreneurs to buy the 'cast-offs' of their fellow council-tax payers disappeared, the 'waste-management solutions providers' instead selling the salvage rights to recycling firms who

saw things only in terms of scrap-metal value. A scandal, in my view.

Live, then, in the knowledge that your new washing machine or car may at one time have been a Garrard 401, the chassis of a Quad valve amp or for that matter a rare 1930s racing bicycle!

Eventually, analogue radio tuners will themselves be fit for little more than recycling; yes, FM radio will go the way of the scrap-heap, courtesy of governments obsessed with all things digital, and that 20MHz slice of VHF spectrum will be sold to the highest bidder. Not even the inconvenient fact that huge numbers of cars are still equipped with analogue-only radios will stop them. In other words, enjoy FM while you still can!

In the meantime, it's good to know about operations like Freecycle (<https://www.freecycle.org/>) before disposing of the consumer goods no longer wanted, not considered worthy of repair not sold at a car boot sale or on eBay. Some charity shops accept electrical items, although they have to be in working order. Jumble sales still crop up, too.

People should also look at local repair cafes (<https://repaircafe.org/en/visit/>) as equipment they bought with their hard-earned money might not be beyond redemption after all. At the cafe I help out at, hi-fi components (most recently, a Technics amp) aren't unknown. The old repair shop might be a curiosity in 'throwaway' 2017, but repair cafes buck the trend and a 'fix' can be yours for nothing more than a donation. In summary: re-use before re-cycle. **MP**

OLD TAPE MACHINES

Reading Dave Tutt's article on old reel-to-reel tape machines I have a suggestion; polish them up externally, add a couple of pristine 10" reels and put on the sideboard as a work of art. Those of us who remember the bands on Top Of The Pops with something like a Revox gently spinning its reels in the background would

immediately appreciate the cosmetics - even if the internals have melted/worn out/destroyed beyond repair.

Think of the advantages; no worries about setting the bias and/or tape compatibility, no cleaning or aligning of the heads ever again, and no forking out £10s, maybe £100s, for tapes - just play your favourite record or CD and pretend it's the tape you're listening to. Hey presto! Instant nostalgia!

Of course, this doesn't work with cassettes...

Yours sincerely

John Malcolm

Hi John. I'm afraid some of my customers have already beaten you to the idea. I have a customer with a Teac 3440 1970s 4 track home studio machine on the side next to his 55 inch TV just as an ornament even though I spent 3 days renovating it! I also have a customer with a Akai GX4000DB looking great but he won't let me repair the power supply so it will run! Such a waste! **DT**

Why doesn't it work with cassettes? Some cassette machines are dramatic in operation, flickering meters or LED bargraphs, tape counters, backlit reels (great if you can find 80s-vintage cassettes with 'spools' visible through transparent housings) and - if you have access to a 1980s RX-series Nakamichi deck - the unusual 'reversing' system that unloads the cassette and rotates it through 180 degrees before taking it back into the machine!

An older Akai autoreverse machine (the Invert-O-Matic from 1972) was even more impressive to watch. You don't have to just 'pretend'. Why not 'keep it reel'? There are good reasons for doing so. Although recording will add distortion, noise, speed instability and high-frequency compression to one degree or another I personally find that dubbing digital audio to reels (usually 19cm/s) can in some cases make the



A Teac A3440, available on Canuck Audio Mart, UK.

sound more acceptable subjectively - especially if the original mix is overly forward or bright.

And what about making open-reel compilations of your favourite music to listen to? All killer, no filler! Use 9.5cm/s with Dolby, and you'll get long continuous running-times (90 minutes per side of a 7in. 1800-foot spool of LP tape - double that for a 10.5in. reel containing 3600ft).

A quarter-track deck gives you two sides of recording/playback (some machines will 'reverse' automatically) but single-sided recording is the price you'll pay for the better performance of a half-track machine (flip the tape over, and it will play 'backwards' - something that will be familiar to theatrical effects departments and rock/electronic musicians. Yes, it's the closest you'll get to the analogue equivalent of a digital music player and its seemingly-endless solid-state capacity!

Pre-recorded reels are today's niche items and hence rather expensive. But if you go to a vintage audio fair (like the Tonbridge Audiojumble), you can get pre-recorded reels of 60s/70s era music (mono or stereo) for far less money. You'll often find unused tape stock (still wrapped) or reels you can re-use (avoid sticky shed-syndrome era Ampex!). Oh, and you'll find the decks too that still look good in 'genuine' operation if you prefer to be visually-distracted from the music. But is gawping at hardware a substitute for witnessing a 100-piece orchestra or rock band performing in front of you?

P.S. I'm afraid your bid for dictionary stardom is in vain. 'Destroyed' is indeed a word - the past tense of 'destruct' - although 'destroyed' is used far more often.

MP



"A 1980s RX-series Nakamichi deck. It has an unusual reversing system that unloads the cassette and rotates it through 180 degrees before taking it back into the machine" notes Martin Pipe.

Portable Punch

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

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

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

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

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

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

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

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





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

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

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

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

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

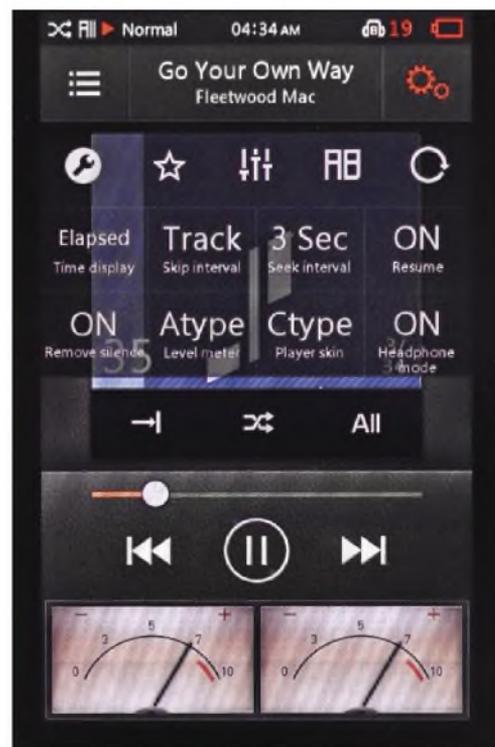
decent enough with bright clear graphics and fast response times.

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

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

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

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



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

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

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

SOUND QUALITY

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



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

Stereo 60 Our Finest Integrated Amplifier

HI-FI WORLD



HI-FI WORLD said:

**ICON AUDIO
STEREO 60 MKIII
KT150**



OUTSTANDING - amongst
the best.

VERDICT

A lovely sound with plenty
of power and adjustability. A
well developed design.

*Innovative Designs
From Icon Audio*

designed by David Shaw

Shown with upgraded valves and Jensen copper foil copper paper in oil capacitors

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The "easy bias" meter enables simple checking that the excellent KT150 is at optimum performance, the meter also gives an approximate indication of the output power. Remote control is also included for the precise control of the volume level from your armchair.

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

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

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

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

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

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

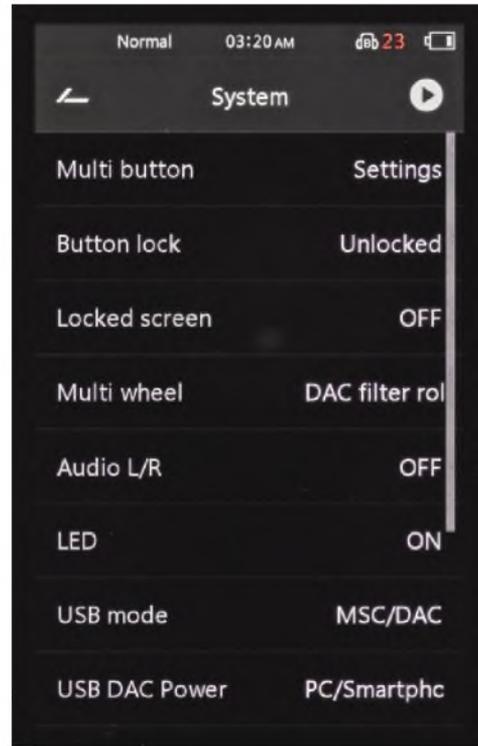
digital output restored.

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

CONCLUSION

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

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



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

MEASURED PERFORMANCE

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

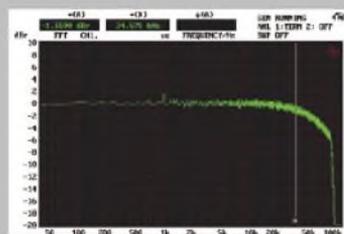
dynamic range (-16dB). At 2V the Plenu2 gives the same output as a CD player and can be used as one (like most portable players), powered by an external 5V supply.

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

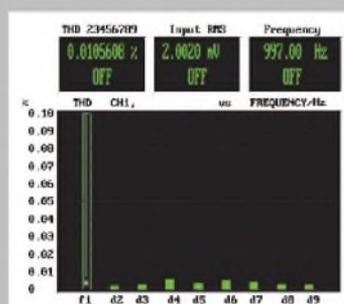
Frequency response with 192kHz sample rate PCM digital measured flat to 34kHz (-1dB) before a slow roll off to the 96kHz upper theoretical limit our analysis shows, so the player will sound tonally even.

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

FREQUENCY RESPONSE



DISTORTION



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

COWON PLENU2
£1,100.00



OUTSTANDING - amongst the best.

VERDICT

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

FOR

- pocketable
- multi purpose
- great sound

AGAINST

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

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A small choice

'Millennial minis' have little in common with their high-end predecessors. But Martin Pipe argues that Panasonic's SC-PM37MD, a veritable audio Swiss-army knife, stands above the crowd.

Hi-fi was, as a mass-market proposition, well and truly dead by the end of the 1980s. It shrunk into today's far more globally-competitive 'niche' industry.

But what of the non-enthusiasts? Regular citizens? Everymen? The mainstream. In the mid-1990s, the 'mini' system became popular. Marketed as a lifestyle product they were pitched at urban-dwellers living in tiny apartments, and those who wanted a reasonable standard of music reproduction in secondary environments like studies, kitchens and bedrooms.

These minis were designed with ordinary price-conscious consumers in mind. Every function was built into a common enclosure of contemporary styling.

Such practice helped to drive down prices and broaden ownership potential.

The system featured here, a Panasonic SC-PM37MD circa 2002, is one such beastie. This remote-controllable unit thus allows you to dub from CD to Minidisc. You could also record, in real-time, programmes from the FM/AM tuner. External inputs, CDs and Minidiscs could also be recorded by the cassette deck, which featured auto-reverse and full-compatibility with ferric and chrome tapes (metal was play-only). Not much effort was devoted to this element of the PM37MD - Dolby noise-reduction and manual setting of recording level are notably absent

So far, so good. But there was more to this modestly-priced (£300)



system than Minidisc, elevating the PM37MD to something worthy of discussion in a hi-fi magazine. Today, we're getting used to the idea of amplifiers with USB ports for music from computers. But fifteen years ago, this modest Panasonic was equipped with the feature. Under a top-panel flap, there was the familiar 'Type B' connector.

I can confirm the interface works with Windows 10 computers, the PM37MD being recognised as a 'BBrown Japan PCM2702'. You don't even need a driver.

The (synchronous) USB 1.0 port was intended primarily for the transfer of music acquired online to Minidiscs. But that doesn't stop it from working as a USB DAC. In other words, you can use the PM37MD as a complete USB audio system that also happens to play CDs/Minidiscs/cassettes and tune into analogue radio stations. It's particularly

valid if your PC is a laptop with puny speakers; the Panasonic's sound is definitely 'bigger'...

Which takes me to the second surprise - the PM37MD is, like some truly high-end hi-fi systems, 'bi-amped' and 'bi-wired'. Internally, filtering splits the selected audio source into separate paths for lower and higher frequencies. Each is then passed, via dedicated amplifiers, to the relevant speaker drive unit. Benefits include superior articulation, speed and efficiency. With the Panasonic,



The PM37MD's auto-reverse cassette deck transport. The head-stack revolves into the position appropriate to direction.

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though, it meant you're stuck with the supplied speakers - each of which connects to the system unit via two pairs of captive wires.

In the Panasonic implementation, you don't get the separate 'treble' and 'bass' paths associated with high-end 'active' speakers and the like. Instead, the enclosure's top-mounted 8cm paper-cone driver had to cover treble, midrange and upper bass; there was no dedicated tweeter. The slightly-bigger (10cm) paper-coned driver beneath delivered lower bass. Each channel gets a total of 18 watts of amplification.

Which is a shame. Implemented slightly differently - a dome tweeter for the treble, plus a 10cm driver to cover everything else down to, say, 100Hz - Panasonic could have given consumers a taste of true high-end sound for a very modest price.

As it is, the sound is reasonable I find it audibly-superior to the music-destroying midi-systems I remember from the '80s - but no better. The PM37MD certainly does a creditable background job playing CDs and the radio in my kitchen with a presentation that can be described as 'entertaining' But it falls short when



Much is crammed into the diminutive system-unit - cassette deck (top) CD transport (bottom), Minidisc (the screened box in the middle), USB DAC, FM/AM tuner, four amplifiers, system control and common power supply.

instability is noticeable on occasions; furthermore, recordings sound rather compressed and lacking in sparkle. Owing to the design of the transport, cleaning the tape path is far more awkward than it should be! But the feature is clearly a 'legacy' afterthought; I expect that Panasonic assumed you'd be using Minidisc instead. This compressed digital medium performs better than cassette. Slight impairments of space and refinement differentiate recordings from the CD original; other than that, the sound emerges remarkably-intact.

USB audio works very well indeed (once again, headphones demonstrate the potential). I compared the sound of a laptop's line out, fed into the PM37MD's top-mounted line input, with the USB port. And the latter won hands-down; it's demonstrably cleaner, less coloured and kinder to musical details.

I've come across two of these systems - it seems they sold quite well. The first was bought seven years ago at a car boot-sale for £15, complete with speakers and accessories in 'as-new' condition. Used daily, it still works today!

The second was acquired, with speakers, at the same boot-sale a month ago for £8 - and it was in

perfect working order too.

So if you come across one, grab it! Even if the CD section no longer works, a cheap PM37MD will form an ideal introduction to playback of computer-stored music, especially if your intention is background music for a home office. Sure, it's not perfect - but the 15 year-old PM37MD trounces many modern Bluetooth speakers, soundbars and PC speaker systems I've heard!



The slot-loading Minidisc feature is one of the PM37MD's high points - its recordings are audibly-superior to those of the cassette deck.

it comes to critical listening.

The low-end can be rather 'lumpy' and ill-defined, while treble is limited in reach.

The CD player, which is compatible with CD-R and CD-RW media, employs a different DAC (Technics MASH) to the Burr-Brown one of the USB input. Headphone listening reveals that it's capable of a crisp and detailed sound. One shouldn't expect much from the cassette deck, and indeed you don't get it! It's hissy, and speed-



What makes the PM37MD special - and arguably still relevant today - is the USB input, which still works with up-to-date operating systems like Windows 10. Thanks to this, something that turns up cheaply at car-boot sales can be pressed into service as a compact audio system for the PC in your office or study.

Warning: the system is of limited use without the matching speakers - so make sure you get those!

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Here's your chance to win the superb Tannoy Mercury 7.4 loudspeakers. Read our review excerpt below and answer the questions.

"The Mercury 7.4 stands just under one metre (955mm) high, 308mm

deep and has a slim front face 315mm wide carrying two 178mm multi-fibre coated, pulp-paper cone bass units set above and below a 28 mm Nitro-urethane damped layer woven polyester dome tweeter with neodymium magnet system in what's termed a D'Appolito arrangement. The idea here is to give a consistent sound balance whether you are sitting or standing, perhaps walking about. It's interesting that the tweeter uses a fabric dome, not

WIN

A PAIR OF TANNOY'S SUPERB MERCURY 7.4 LOUDSPEAKERS WORTH £399 IN THIS MONTH'S GREAT GIVEAWAY!

an aluminium alloy dome, to avoid the zing you commonly get from the latter. The Mercury 7.4 is a smoothy, our measurements show – the tweeter works well.

Two ports on the ear panel exert control on the bass units so they give even sounding low frequency output free of boom, or 'one note' bass. Small, light foam bungs are supplied to lessen bass if need be, in smaller rooms with a boom.

To improve stability these Mercurys come with separately packed moulded plastic feet that must be screwed on; they possess inserts to accept floor spikes, with a set of small steel discs carrying an indent for the spikes for users that don't want to put holes in the floorboards.

Manoeuvring the speakers into position is easy enough as they weigh 15kgs apiece – not heavy. There are three finishes: light oak, walnut or black oak, in artificial veneers. They're smart and well made".

For a chance to win this great prize, just answer the four easy questions at right. Send your entries on a postcard only, by 8th December 2017 to:

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QUESTIONS

[1] The bass unit cones are -

- [a] plastic
- [b] steel
- [c] coated pulp-paper
- [d] bubble gum

[2] Foam bungs -

- [a] lessen bass
- [b] strengthen bass
- [c] offer wind protection
- [d] keep bugs out

[3] The speakers weigh -

- [a] 15kgs
- [b] 15lbs
- [c] 15oz
- [d] 15tons

[4] Finishes are -

- [a] Plum
- [b] Walnut
- [c] Orange
- [d] Aubergine

entries will be accepted on a postcard only

SEPTEMBER 2017 WINNER: PIEGA CLASSIC 3.0 LOUDSPEAKERS
Julie Barnes of Shrewsbury, Shropshire



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
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INSPIRE MONARCH £4,350
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LINN LP12SE £3,600
The UK's most iconic turntable, the legendary Sondek goes from strength to strength. New Keel sub-chassis and Radical DC motor add precision and grip to one of the world's most musical disc spinners. Expensive though.

MICHELL GYRO DEC £1700
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 LP to your laptop.



REGA RP3 £550
The first of the super-quality Regas, little compromised by price and featuring Rega's outstanding RR303 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
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ORTOFON CADENZA BLACK MC £1,800
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Smooth and detailed sound with the ability to accommodate most modern cartridges. Exceptional value for money.



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New, minimalist phono stage 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.



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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 MKII £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.

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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.

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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. Spendor'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 OBH1 £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 8200CDQ £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.

ELECTROCOMPANET 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.



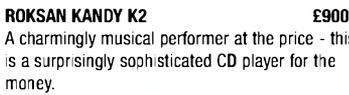
OPPO BDP-105D £1200

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.



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 2QUOTE 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

ASTELL&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.

LOT00 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

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Leema's new Quasar is a one-box amplifier, DAC and streamer. Jon Myles takes a listen.

Quasar amazar

Nothing is ever certain in hi-fi trends – but at the moment it is pretty clear there's a growing movement towards all-in-one units. And especially those that offer amplification, digital-to-analogue conversion as well as streaming and Bluetooth capability.

The reason is simple: they offer convenience, plus the ability to provide the central hub of a home system in one physical chassis – communicating with tablets, smartphones, NAS drives, computers and source devices such as CD players.

The big question, though, is can all this technology be squeezed into a single unit and still retain decent sound quality?

Welsh company Leema Acoustics certainly believe so with their new Quasar unit. Having been founded by ex-BBC employees Lee Taylor and Mallory Nicholls the company initially made its name with small monitor loudspeakers such as the classic Xen.

However, it is now probably better known for its series of electronics – including amplifiers, music servers, DACs, CD players and phono stages. They've also branched

out into producing loudspeaker cables, interconnects and assorted digital connections.

So the Quasar seems a natural development. At first sight it looks like a traditional integrated amplifier with a large, blue central display on the fascia, along with rotary controls for volume and input selection.

Analogue connections comprise three RCA inputs, as well as balanced XLR.

But there's much more inside: no fewer than seven digital inputs (three coaxial, three optical and one USB-B) all feeding a DAC circuit derived from Leema's flagship Quattro Infinity technology. Added to this is a UPnP streaming module supporting file sizes up to 24bit/192kHz via either wired or wireless connectivity, as well as Bluetooth aptX for wireless connection to a smartphone or any Bluetooth equipped device.

All in all, that's a tremendous amount of connectivity and probably more than enough for most users. Amplification comes courtesy of a Class D circuit that produces a powerful 200 Watts into 8 Ohms (see Measured Performance for full details).

Interestingly, Leema have

employed a linear power supply to feed this with a large, custom-wound toroidal transformer from Noratel which contributes to the hefty weight of some 17kg from what is a relatively slim case of 95mm x 435mm x 350mm (H/W/D).

Control is via the front controls, a supplied remote or via a free app for Android and Apple devices. To be honest, the latter is rather basic - lacking the sophistication of alternatives from the likes of Naim, Linn and Cyrus. The front panel



Internal construction is neat and tidy - the top plate providing a heatsink for the substantial mains transformer.

Turn your smartphone into a wireless high-res digital audio player



Combine the Poly streaming module with the multi-award-winning Mojo DAC/headphone amp and effortlessly stream music from your devices both at home and on the go, wirelessly.



Poly



#chordpoly

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discover more: [chordmojo.com](https://www.chordmojo.com)



display also, while clear and easy to read, does not display album artwork which seems strange in a product that counts streaming as part of its appeal.

On the plus side, though, the Quasar is impressively well-built with a pleasing solidity to its casework and a robust feel to the controls which justifies the £2995 price in terms of overall feel.

SOUND QUALITY

With its prodigious power output the Leema Quasar had no difficulty driving loudspeakers to high volume – from a pair of Spendor A1 standmounts to the rather more demanding Martin Logan ESL Classic 9 electrostatics.

Right from the off there's no sense of stress or strain to the music. With Hugh Masekela's 'Stimela (Coal Train)' via CD through an Oppo UDP-205 connected to the balanced inputs the vocals were rich and resonant with the backing instrumentation having a good deal of air and space. As the track went on it was impossible not to be drawn in, the Leema handling the changing rhythm and tempo well.

Staying with CD and New Order's 'Republic' the opening guitar notes sound a little soft, though. There's not the definition or clarity I'd usually expect, which robs the

track of some impact. Bass guitar, however, had plenty of punch and a tuneful, rich vibrancy that is more akin to Class A/B amplification than the sometimes dry presentation Class D can provide – probably due to the hefty linear power supply.

Switching to the digital inputs and the basic quality of the Leema stays pretty similar. Streaming Nick Cave's 'Kindness Of Strangers' (24/96) everything was in place and tuneful, right from the gentle piano intro to the understated bass which pushes the track along.

The only thing I'd crave, however, is more detail and some extra presence. Compared to the Naim Uniti Atom for instance (see review this issue) the Quasar is rather more laid-back and easy-going. That said, it is considerably more powerful and offers a greater number of inputs.

If you like its sound (and many will) then it offers a comprehensive



Rear connections include balanced XLR and unbalanced RCA analogue as well as both optical and coaxial digital. Two wi-fi antennae ensure a strong signal while Bluetooth is also included.



Although Class D, the Leema uses a linear power supply - which takes up a major part of the case and contributes to its 17kg weight.

one-box solution for amplification, network streaming and connecting digital and analogue sources.

CONCLUSION

The Leema Quasar isn't perfect but as an all-in-one unit it has much going for it. If you value convenience allied to good build quality and a smooth sound then it's definitely worth considering.

MEASURED PERFORMANCE

The Leema Quasar produced 200 Watts into 8 Ohms and 225 Watts into 4 Ohms; it is very powerful and can drive any modern loudspeaker to high volume. Into a 4 Ohm load, current limiting protection kicked in, keeping the 4 Ohm figure close to the 8 Ohm value.

Sensitivity of the Analogue 1 (XLR) and Analogue 2 (Phono socket) were identical and very high at 130mV for full output, also the amplifier goes loud quickly and has a 250 step volume control.

This is a Class D amplifier and distortion measurement showed classic high levels of 0.3%-0.6% at 10kHz, with extended harmonics that varied randomly in amplitude as level changed – discordancy that the ear detects. The Quasar was poor even by Class D standards, set by NAD with custom Hypex modules.

Frequency response extended flat to 52kHz into 8 Ohms, but drooped badly into 4 Ohms, reaching 14kHz (-1dB). Again, this is a classic Class D problem attributable to the output filters and

the latest and best Class Ds manage better through improved feedback arrangements.

The digital (S/PDIF) input gave 98dB dynamic range with hi-res digital – poor, worse than CD (102dB). With CD this sank to 96dB. Distortion alone measured 0.3% with hi-res and 0.4% from CD, where 0.05% and 0.2% are expected.

Frequency response extended flat to 38kHz (-1dB) with 192kHz sample rate. The optical input accepted 192kHz sample rate where some still fail. USB gave similar results to S/PDIF.

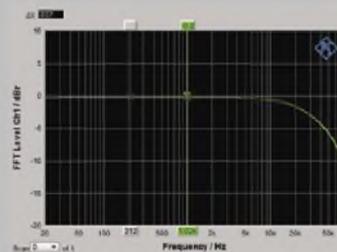
The Leema Quasar measured poorly in most areas, having few redeeming qualities except very high power. **NK**

Power (8 Ohms) 200W
Frequency response (-1dB) 5Hz-52kHz
Distortion (10k, 1W, 4 Ohms) 0.36%
Sensitivity 130mV
Noise -84dB

Digital (S/PDIF/USB)
Frequency response 10Hz- 33kHz
Distortion (24bit, -60dB) 0.3%

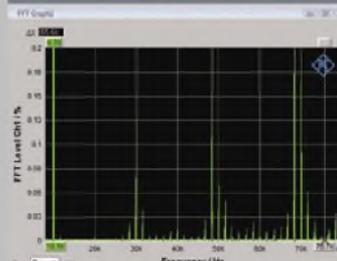
Separation 90dB
Dynamic range (S/PDIF/USB) 98dB
Noise -91dB

FREQUENCY RESPONSE



DISTORTION

THD+N	2.8286 V	9.9999 kHz
Dist	OFF	OFF



LEEMA QUASAR £2995



GOOD - worth auditioning

VERDICT

Leema's Quasar offers a wealth of connectivity options with a distinctive sound.

FOR

- powerful amplifier section
- DAC/streamer/Bluetooth
- build quality

AGAINST

- basic app
- sound could be more detailed
- Class D distortion

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PW Ti

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

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

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



AUDIO

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Clever Thinking

Jon Myles tries out the interestingly-named Brainwavz B200 dual-driver in-ear headphone.

Brainwavz may be a new name to many readers – but the company has been manufacturing a range of well-regarded, affordable, in-ear headphones for a number of years now.

Its products range from around £20 to the £150 mark and come in a range of shapes and sizes. Two of its most popular models are the B100 (£38) and B150 (£53) which have found a ready market for those seeking decent sound for not much money, for use with mobile devices.

Both these use a single balanced armature driver but they've now been joined by a more sophisticated model, the B200 (£90), that features two balanced armature drivers in a woofer/tweeter combination and promises a greater frequency range, especially at the low end.

They are smartly designed with a slim, shaped casing and an over-ear clip on the end of the 1.3 metre-long braided cable to help keep them in place. Missing, though, is any form of in-line control for your mobile device which may, or may not, be a problem for you.

Included are six pairs of silicone ear tips for getting the correct fit plus a single set of Comply memory foam tips. There's also a stylish red and black hardshell carry case, shirt clip and Velcro cable tie. For the price it's a comprehensive package and comes well presented.

COMFORT

With right tips in place (medium for me) the B200s fit snugly in my ear thanks to their sculpted shape which makes them look more like a custom-fit than a universal design when in use. They are also light so are good for long-term use when out and about.

SOUND QUALITY

The Brainwavz are nicely-balanced in presentation with a relatively even sound, devoid of harshness. The bass at the start of The Jam's 'A Town Called Malice' was firm and well-tuned. Fans of mega-bass may find they come up a little short, though – instead it's more of a clean, natural sound.

Through the mid-band there's a little emphasis on the upper level

which means guitars and vocals come through with great clarity. With The Pixies' 'Debaser' Joey Santiago's lead guitar and Black Francis's vocals were really pushed at me with great definition. It's an exciting listen – which is just as it should be.

Upper frequencies don't extend quite as far as some in-ears but were detailed and with little muddle. Tracks sounded clear and crisply relayed.

These 'phones go loud and I didn't have to push the volume far on my iPhone 7 before it was at ear-damaging levels. I'd recommend being careful when first attaching them!

Compared to something like I MORE's 1008 in-ears which are also a dual-driver at a similar price (see review *Hi-Fi World* May 2017 issue) the Brainwavz are not quite as smooth and even – but they do sound a little more dynamic and have a better fit.

CONCLUSION

A quality pair of headphones at a decent price. A good step up from more basic sets.

BRAINWAVZ B200 £90



EXCELLENT - extremely capable

VALUE - keenly priced

VERDICT

Nicely-designed in-ear headphone with a dynamic yet balanced sound.

FOR

- strong upper mid-band
- detailed
- fit and finish
- dynamic sound

AGAINST

- no in-line remote
- some sound smoother

Brainwavz Audio
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Open the reel

Repairman Dave Tutt opens up a Teac X-2000M open-reel recorder, explains what goes wrong over time – and how to fix it.

The Teac X-2000M open-reel tape recorder (1985-90) is a beautiful piece of machinery. As analogue recording regains interest in the professional audio world, the one I am looking at here is resonant, since it is a half track version that gives lower noise and distortion because of its wider track width. Half tracks provide better quality than quarter tracks but consume twice as much tape for a given recording time, so are for those with deep pockets.

The machine I am looking at has dBx noise reduction and plenty of bells and whistles to keep an owner spooling tape for many a happy hour. However, be aware of several issues that might just make you think again about trying to find and use such a lovely recorder. Current prices range from £600 for a restoration-project machine that may need everything listed here and more to resurrect it, or £2400 plus for one that may have been restored, but by who and to what standard being an issue.



I am going to give away a bit of a secret now. You see, all Teac machines suffer from sticky pinch roller actions at some point or other. It is almost like a stock fault and this mine wasn't any different. Teac used a simple solenoid powered mechanism to lift the pinch rollers onto the capstan and it is there that many of these

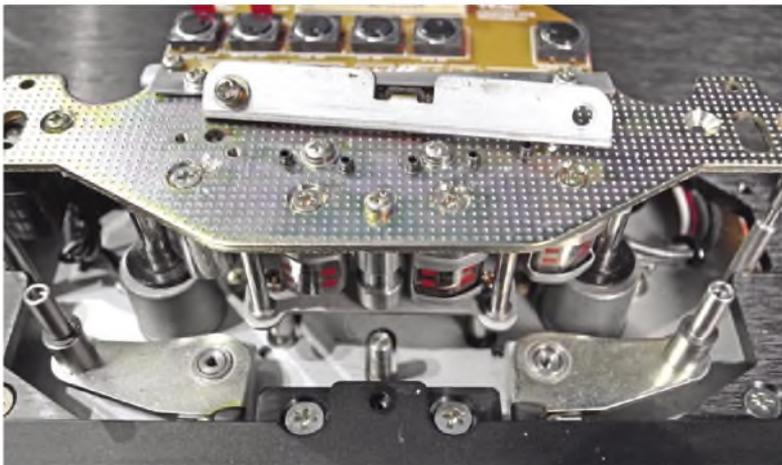
machines seem to have problems.

Earlier models such as the A-4070 had a very simple steel pole with another steel strip wrapped around it so that the solenoid could do the business. These all seem to have jammed or burnt out the solenoid or its electronics at some point, due to lack of lubrication on a steel to steel joint.

This X-2000M is rather more sophisticated, having a pair of nice sleeve bearings supporting lever arms with spring loading and all the things you would expect of this class of machine. However, the grease necessary for most electro-mechanical equipment over years of use spoils the show. The bearings and the arms become so tight they are pretty much stuck.

How to fix it? Well actually it can be done entirely from the front of this machine but you do need the back off as well to access two hidden screws. You just can't win!

The plastic moulding that fits



Head assembly and solenoid lift arms exposed (less pinch rollers).



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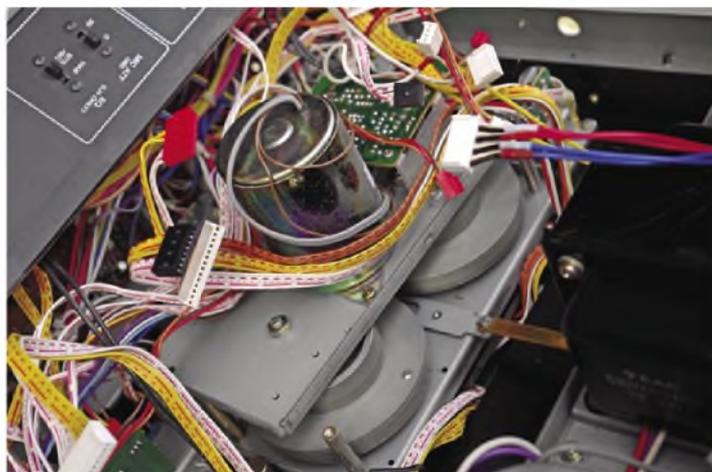
With three major innovations and two patents – the Neutral Inductance Circuit, the Tuned Mass Damper midrange suspension, and the Infinite Horn Loading housing for its Beryllium tweeter – Sopra brings unprecedented technical ingenuity and matchless performance, thrilling the senses like never before. The longing for exceptional speakers in your living room is over.

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around the head block and pinch roller assembly needs to come off. Another hidden screw sits behind the display for the counter. This has two screws at the front but it is the cables that are secured above the dual capstan motor assembly that need loosening; it is necessary to squeeze your hand in the back and release the retainers, not forgetting to put them back on reassembly. This allows the counter to be moved out an inch or so to get to the screw. There are then two other screws and the visible three Allen key screws that let the whole thing out.

The back tension arm rollers and the pinch rollers must be



The partially dismantled capstan assembly, less belts.

sensible to leave it alone at this stage in case you make things worse.

Of course that is definitely not going to be the only issue. My sample had no capstan rotation as it has belt issues with what is known as rubber rot. All machines that have belts, idlers and rollers can return to latex – and a sticky black liquid it is too. From discussions with a customer who was a research chemist at a plant making exactly the formula's used for these parts, it is due to insufficient sulphur in the mix when the rubber was formed pre-moulding.

The two capstan belts here had gone in a similar way. They had stretched, stuck and become entangled in the mechanism – hence no tape transport. Fortunately, stretching was the only problem (they were at least double the original length) but probably another 6 months would have seen them turn to goo. It is about a 30 minute job to remove all the bits to get to them but worse is that there are very few spares left available anywhere in the world. The capstan 100mm diameter flywheels are bound together by a 14mm wide belt whilst a second belt of the same width loops around the

flywheels on a 50mm diameter and the motor pulley. I wait patiently for the arrival of the new belts from the only currently visible source. I hope they are correct!

Pinch rollers, as I have stated in these pages before, I think are almost as rare as hens teeth and for certain makes and models are closer to the search for unicorns. Teac ones for some models seem to have been re-engineered somewhere in the world, although their cost of in excess of £100 a pair is beyond what most people would want to pay. These rollers were soft as in showing signs of interior failure, although not so soft as to deform. If you want to know what to feel for it should be no softer than the square lumps of liquorice and ideally somewhat harder and should not deform and stay out of shape. If it does then prepare your wallet for a heavy withdrawal.

I have to say that it has so far not been possible to actually run this machine. I hope by the end of October to have enough parts to get some sound from it. As you can imagine, many of these machines require quite a lot of work mechanically and may well need electronic and electrical work too. I would suggest that, if you intend to go back in time to reel-to-reel then the cost in the initial hardware, the renovation and any subsequent tweaks you might like to fund may push the cost well into the £2000 price band. I know that Hi-Fi for many people regularly reaches into 4 figures but please be aware of it before you start! I will report on the progress in my next column.

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The hidden screw inside, above the back tension lever and to the right top of the picture.

removed too, both of which have screw-on caps, but the other two rollers stay in place. You can see from my picture where the issue is. The manual suggests all sorts of further adjustments for the tension should you work in this area but, because this is somewhat tricky, requires much further stripping down and may not need to be changed in any case it seems



Teac-x2000m. The head plate that has to be removed for access



SAXON

The Solid Book of Rock Demon

After a fallow period in the heavy metal band's history, this period of the group's career saw a resurgence and a gradual turn towards their roots. "It was a move back to a British heavy sound, not so much a European angle" said band co-founder and lead singer Biff Byford.

This excellent collection tracks that movement and continued evolution, focusing on the band's album period, nine of them from 1991 to 2009 including 'Solid Ball Of Rock', 'Forever Free', 'Dogs Of War', 'Unleash The Beast', 'Metalhead', 'Killing Ground', 'Lionheart', 'The Inner Sanctum' and 'Into The Labyrinth'. Fans are also treated to eight bonus tracks.

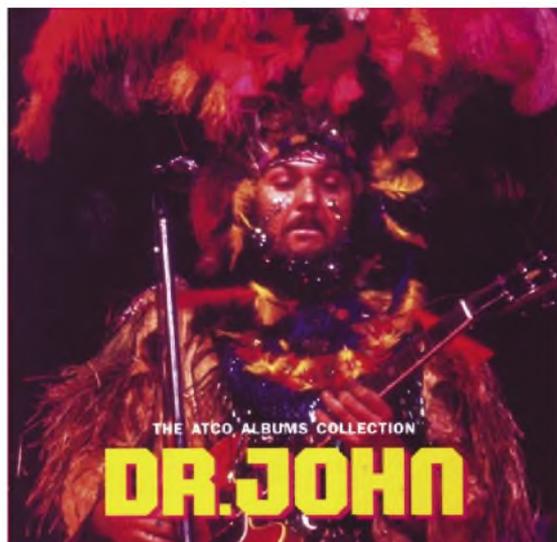
This fascinating box set also includes two bonus CDs. 'Classics Re-Recorded' was originally issued with the initial pressings of 'Killing Ground' and 'Lionheart – rough studio mix', originally issued on the 2006 limited edition.

This 'Book' Set also contains three bonus DVDs, the limited-edition DVDs originally released with 'Lionheart', 'The Inner Sanctum' and 'Into The Labyrinth'. The entire luxurious package is served within a twenty-four page 12" x 12" booklet with lyrics included, plus photos. A new cover painting is featured by Paul R. Gregory.

Fans might want to look out for an exclusive limited-edition containing a print signed by Saxon front man Biff Byford, only available from Amazon.

In mastering terms, the CDs are admirably balanced for a digital disc format. I did find that the vinyl editions were a little bland and overly unassuming. I wonder if these very masters have been transferred to CD. The CD format has added its own slice of lift and pizzazz to inject a slice of energy and vigour into the overall presentation, giving the performance a fuller and slightly edgy twist to the upper mids.

AUDIOPHILE CD



DR. JOHN

The Atco Albums Collection Atco

It's amazing that this man had been active in the music business since the late fifties but he really didn't become generally known until the 1970s. If that's not an encouragement to struggling creative artists out there, I don't know what is.

Formerly known as Mac Rebennack, Dr John offers a powerful presentation of blues, boogie-woogie, rock and more but always draped within a spiritual voodoo, New Orleans wrapper, which gives his music a sense of the exotic and the wild.

In demand as a top session man in the sixties, his solo works have always attracted the talented and famous. 'The Sun, Moon & Herbs' featured Eric Clapton and Mick Jagger, for example, while Jerry Wexler produced 'Gumbo'.

Presented in a clamshell box, this set offers the first seven albums from the man who began his career in 1968. All seven studio albums

included in the collection have been remastered for the first time and could be said to hold his best and most creatively interesting work. The set features: 'Gris-Gris' (1968), 'Babylon' (1969), 'Remedies' (1970), 'The Sun, Moon & Herbs' (1971), 'Dr. John's Gumbo' (1972), 'In The Right Place' (1973), and 'Desitively Bonnaroo' (1974).

This box set is an ideal illustration of just how far studio-based ADCs have come in recent years. The mastering on this set is not only admirable but, in relative terms for a CD, is pretty darned quiet in terms of loudness with an airy soundstage on 'Gumbo'. The gamut of instruments on offer, along with the backing voices take full advantage of the open soundstage on 'Gris Gris', providing a full and, for the much derided CD format, a richly mature presentation. It's not completely perfect but this box set reflects the impressive CD format improvements.

Liverpool-born China Crisis has always been an interesting band. They take a low key organic band approach and meld it with electro/synth content. The difference with most bands who take this approach, though, is the energy...or lack of it. That's not being derogatory in any way but synth-based bands from the eighties tended to use synths to make a noise, to provide punchy beats and, frankly, to show off their toys.

In this, their 1982 debut, China Crisis used their synths to provide texture and ambience, atmosphere and emotion. If you ever saw the band play the single from this album, 'Christian', on Top of the Pops, then you would have seen an energetic and vibrant show grind to a shuddering halt as the band took the occasion by the scruff of its neck and infused the space with gentle, meditative, melancholic, sensitive and thoughtful lyrics covered with smooth, almost soulful

and dreamy electronic washes. The kids in the audience had no idea how to dance with it: some looked lost, otherwise were mesmerised and swayed a lot.

There are more upbeat tracks on this album, of course, but even they have a tender jazz funk element to their presentation that demands that hips shimmy rather than shake.

Now remastered from the original tapes and including new interviews, the sets contains bonus tracks, BBC Sessions as well as demos.

Also look out for 2CD versions of 'Working with Fire and Steel: Possible Pop Songs, Vol. 2' and 'Flaunt the Imperfection'.

In mastering terms, I was happy with the performance. The delicacy and almost tender approach to the music was reflected in the exacting and detailed presentation that highlighted, with aplomb, each plucked acoustic guitar string and lightly applied synth drum.



CHINA CRISIS

Difficult Shapes & Passive Rhythms, Some People Think It's Fun to Entertain, Caroline

AUDIOPHILE CD

The problem with Godley & Creme, as performing musicians, as a duo is...that they were Godley & Creme, performing musicians, as a duo. The guys eventually saw this issue too and ended up becoming supreme masters and innovators of the music video instead.

Earlier, when the chaps exited 10cc, they left a fractured band that span out of control, like an aircraft suddenly left with one wing at 50,000ft. It span out of the sky, eventually crashing, while spouting a few hit singles on the way down. G&C, meanwhile, confident in their decision to 'do their own thing' entered a new space with vast amounts of optimism, creative energy, ideas and talent. Trouble is, they needed a catalyst to make it all work.

What G&C produced, therefore, was a stream of half-finished albums with lots of

highlights, great songs, interesting ideas and oodles of 'ifs' and 'maybes' that never really worked out or came off as LPs. Frustrating for them and frustrating for the listener.

So you'd think that I would advise avoiding this new box set like the plague wouldn't you? Not at all! This pair are so talented that even their half finished, quirky, eccentric and often Zappa-esque projects are more worthy than many of their contemporaries manicured albums.

Included here are: 'L', 'Ismism', 'Birds of Prey', 'History Mix' and 'Goodbye Blue Sky'. The set also includes a fifth disc of B-Sides and extended mixes.

Audiophiles who enjoy CD play will be very happy with this box set in terms of its mastering quality. As with all commercial CDs, there is a touch of compression but it is lightly applied while detail and insight is to the fore here.



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"Digital relies on many related ideas that are in themselves fantastic"



Noel Keywood

My neighbour contacted me the other day and asked if I would remove my unsightly VHF/FM aerial. The cheek! I always thought it looked wonderful, sitting atop a 15ft aluminium pole, glinting in the sun.

It has done that for – er – thirty undisturbed years now, mainly because the silvery glint against a blue sky made it invisible on a Polaroid (remember them?) taken by Westminster City Council's planning department. They could not therefore prove it existed and was an unsightly structure needing removal.

But now I finally concede that the glory days of analogue radio are just about over and that I can make do with a smaller, less ambitious and intrusive VHF/FM aerial, hidden somewhere amongst my also outdated Victorian chimney pots.

As Martin Pipe notes in his insightful musings on Radio 3 quality, it isn't easy these days to say that old analogue VHF/FM sounds better than the BBC's high quality transmissions over the internet. And since new VHF/FM tuners now are less common than valve-powered iPhones I have to acknowledge that VHF/FM and big analogue aerial arrays are a thing of the past, swept away by digital. In spite of Queen's pleadings in Radio Ga Ga, radio has become a background noise – well, DAB that is – and teenage nights are not the same any more; teenagers went digital some time ago (in many senses!).

But what a past radio has had, of which the removal of my aerial signals an end. Heavens, my neighbour is also an electrical engineer (modern sort) and he did not know what it was for! How the world changes.

VHF/FM dates back to the fifties, the BBC starting mono transmissions from London's big

Wrotham transmitter, located on a hill some twenty miles South East of London, in 1955. But it was radio communication that kicked off the electronic era. Guglielmo Marconi's Morse transmissions across London (1896) then across the Atlantic, aided by the invention of the amplifying valve (1906) by Lee De Forest, got electronics under way because the potential seemed vast – and so it proved to be.

It's difficult to remember that radio gave birth to electronics. Yet only 30 years after steam radio kicked things off, digital was ushered in through the work of Claude Shannon. Digital existed before World War 2, no less – and I read recently that double triode valves were purposed as on-off switches for computer use, not as sweet sounding analogue amplifiers in 21st century audio products. If so, design work for digital started longer ago than most of us now realise.

The wane of VHF/FM symbolises the change from the old world of analogue electronics to a new world where electricity is switched on and off and – somehow – humans have managed to make sense of doing this. It's a bit like someone walked into my house, started switching the lights on and off and then the fire brigade arrived because a neighbour understood Morse code.

It's all a bit fantastic – but digital relies on many related ideas that are in themselves fantastic, like binary arithmetic and Boolean algebra. Ultimately this has all led to products like the Chord Hugo 2. I review in this issue and streamers like Naim's Atom that receives Radio 3 in digital form over telephone cables rather than as radio waves through the 'ether'.

Aerials it would seem are a dying idea, until you consider the importance of short-range Wi-Fi. So

radio hasn't gone away, it has just morphed in ways that we could not have imagined not so long ago.

Similarly I also have bundles of coaxial cables laid through partition walls and under floorboards to route television and radio signals around the house. It was cutting edge in the 1980s – but Neanderthal now.

Just beneath my large VHF/FM aerial sat a more modern television aerial that once received analogue and then afterward digital TV signals.

These haven't yet been consigned to the dustbin but with the rise of Netflix, YouTube and all else I suspect they're of declining importance in people's lives. Digital over the internet, mostly via telephone cables, is dominant and of course there are those small, medium and large satellite dishes to consider. Will they all slowly die out as well?

Will swanky clean roof tops free from large aerial systems then become safe, open territory for delivery drones to land on? Could he. The garden isn't a secure place for goods to be dropped, at least, not where I live. Perhaps I should see the removal of all the aerial clutter up there as a step forward to the future – to helicopters!

I'm not sure about this at all; it seems to make as much sense as my old coaxial cables now do, or the optical cables in the street laid to deliver analogue TV from Philips Laservision machines many miles away in Baker Street. We all bought in, only to find these ideas shelved a few decades or so later. Now they seem daft, but they didn't in their time.

So I'm mourning the loss of my aerial and wondering where to go next, without ending up down another technological backwater.

This, I suspect, is going to be an on-going story that affects us all as the next big idea comes along to fight for a place in our lives. ●



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"The music is brilliantly vibrant, hampered by no boundaries"



Paul Rigby

about MP Tony Benn once recalled the thoughts of his father, (Viscount Benn, an ex-minister in Ramsey MacDonald's government in 1929), who stated that "Every life is like a pebble dropped into a pool and the ripples go backwards and forward forever, even if you don't see them again." When you buy a reissued record from a favourite, long gone, artist. There are those ripples. Right there.

The ripples move in other ways too. The notion of one's past catching up with you is familiar to TV watchers. You know the sort of thing, grizzled ex-cop, seen it all, done it all, holds the scars on his body and on his soul, failed marriage, tenuous relationship with his children. And then? "Just when I thought I was out, they pull me back in!" Which can also be applied to members of the mafia, of course, and ex-freelance journalists.

But, it can also be attributed to the condition of the experienced musician. One with a history that spans many years.

I was reminded of such thoughts when I was looking over the output of a small record label from Germany called Vinyl on Demand (www.vinyl-on-demand.com). This is a fascinating record label for audiophiles because its entire raison d'être is based upon the 'rare'. It's own output, I hardly need to add, is limited in nature too.

What VOD likes to do is to investigate the cassette culture of yore. We've heard, during the past several months that cassettes are rising in numbers in terms of sales and there is a healthy cassette-only scene amongst genres such as industrial music (a scene which has created some startling cassette packaging, including one box I saw constructed wholly of concrete) and

that energetic skateboard-garage-rock that is a big favourite still with the young, especially in the USA.

VOD's 'thing' though is to mine the music that was only released on cassettes during the late seventies and early to mid-eighties. This was the height of DIY music. Cheap portable studio kit was very popular indeed. Tascam's Portastudio was immensely popular, allowing you to record your masterpiece in your back bedroom direct to a cassette. All you had to do was duplicate the cassette and you had yourself a business!

Cassette culture produced a host of albums, EPs and singles in terribly limited numbers from one up to a 100 or so. Hence, not too many people grabbed them or heard them. This meant that there was and still is a raft of sometimes brilliant, often very good music floating around the planet, not doing very much at all.

VOD gave itself the job of rescuing these potential gems. More than that, though, it bestowed upon these creations the ultimate note of respect.

It carefully excavated the music from the tape, equally carefully mastered it and then pressed the music onto vinyl. A magnificent compliment to the artists concerned.

I've been looking at a few of these releases which are all beautifully put together and designed.

Marc Barreca's double album, 'Recordings 1978-1979' features American-sourced electronica in the mode of Brian Eno that features gloriously textured and often portentous soundscapes that build and rise like an avant garde piece of architecture.

Galen Herod's 'Word & Musics' features works from 1983-1988 but his style is more post punk and synth pop in style. Herod was an

observationalist on American culture with a witty method of implementing those nuggets in his music. He had the musical hooks to keep you involved though.

Studio 12's 'Recordings 1980-84' goes further. This is a magnificent five LP box set from a dedicated tape-based label, featuring a wide variety of artists such as Wim Dekker, Siebe, Vital Loud and Nexda. You may have guessed already – this one was based in Holland, sourcing music from the eighties Ultra movement via poor artists who generally resided in squats in Haarlem (and in suburbs like Aerdenhout and Heemstede) to produce minimal electronic music, drones, tribal music and other electronica. The artists used a record shop called Amigos in the Kruisstraat as a meeting place.

The music is brilliantly vibrant, hampered by no boundaries, totally adventurous but also rhythmic and featuring often complex melodies.

Just imagine one of these guys now, sitting watching Coronation Street, pipe, slippers, cat on his lap, surrounded by family, the height of respectability. When, one day, falling through the letter box, is a note. It points a finger. "J'Accuse!" it announces "J'Accuse you of being experimentally adventurous and a revolutionary musical craftsmen of the eighties!"

He slowly raises his face to stare into his past. Lost in thought, he crumples the letter (with the VOD return address) in his bony hand, just in time to see the welling tears in his wife's face, standing by the door, her knuckles white as she grips another arm, an innocent, unknowing child by her side, smiling in wonder. "They've come?" she chokes.

His voice emerges from clenched teeth. It is hoarse and supported by bitterness. "Just when I thought I was out...!" ●

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"Opera has been at the cutting edge of political debate"



Jon Myles

If there's one form of music I've never really managed to grasp then it's opera. Apologies, but for some reason I've always found it absurd and lacking in anything I'd like to hear on a repeated basis.

I'll admit I've only actually been to one – purely as a favour to a friend who needed accompaniment. But that one just confirmed my opinion – totally incomprehensible to me (it was in Italian!) and seeming to consist of people singing to each other loudly with no discernible plot at all.

However, I did suspect that part of this may have been associated with my dislike of musicals such as *The Sound of Music*, *Seven Brides for Seven Brothers*, *The Lion King* and countless others. It's a dislike based on the, to me rather rational, knowledge that people don't spontaneously burst into song backed by an orchestra at odd moments of the day.

So, the only real opera pieces I've ever got along with have been Wagner's *The Ride of the Valkyries* and Puccini's *'Nessun Dorma'* – mainly because the former was used in one of the most dramatic scenes in the film *Apocalypse Now* and the latter opened the daily coverage of the 1990 World Cup in Italy.

However, a recent visit to the Victoria and Albert Museum in London has changed my perceptions – all because of its brilliant new exhibition entitled *Opera: Passion, Power and Politics*.

Staged in association with the Royal Opera House the display is arranged over several rooms and tells the story of opera from its

beginnings in Italy to its present form. And it's a fascinating story – mixing confrontation, grandeur, social comment and, inevitably, glorious excess at times.

Don the supplied headphones and you are given a musical soundtrack accompanied by a spoken commentary on the various exhibits – which include stage props, costumes and paintings.

So you start with Monteverdi's *'L'Incoronazione di Poppea'* from 1643 and its final duet as you walk past paintings of gamblers and courtesans. I'd never heard this piece before but in this context its meaning was immediately clear and made all the more relevant and entrancing.

As the exhibition continues it becomes evident how often opera has been at the cutting edge of political debate. Mozart's *'Le Nozze di Figaro'*, for example, is based on the values of Enlightenment Vienna in its attack on aristocratic codes of privilege and licence. Here, a passage from Jean-Jacques Rousseau's 1758 *Letter to D'Alembert on the Theatre* is painted on the wall.

"The stage is, in general a painting of the human passions, the original of which is in every human heart," it reads.

Move on and you are transported to Milan and Verdi's *'Nabucco'* which tells of a national struggle for independence. The headphones play *'Va Pensiero'* while your eyes take in a photographic installation of the auditoriums of 150 Italian opera houses. It is stunning and brings the music to life in a way that truly grabs you.

Soviet-era Stalinism also makes

an appearance with Shostakovich's *'Lady Macbeth of Mtsensk'* – which was debuted in Leningrad in 1934 and summarily suppressed by Stalin a mere two years later. Classic Soviet posters adorn the walls while a reconstruction of Shostakovich's study is cordoned off by red tape to illustrate how he suffered at the hands of Kremlin bureaucracy.

There are also some amazing exhibits, including costumes by Salvador Dalí and Gianni Versace and – my personal highlight – Richard Strauss's annotated copy of Oscar Wilde's play *Salome* with accompanying illustrations by Aubrey Beardsley. You then see a video of the final scene of the Royal Opera House's production of the opera. I'd never heard, or seen, this before but stood transfixed by its musical power. So much so that as soon as I returned home I downloaded a high-resolution version of *'Salome'*.

And, in fact, I'm now working my way through most of the operas featured in the exhibition – listening to them with a much better understanding of the context in which they were written and starting to enjoy the power and passion of the music.

Which is a testament to just how educational *Opera: Passion, Power and Politics* is. If, like me, you have never really understood opera I urge you to go and see it, as it might change your mind too. And even if you are already a dedicated opera-lover you'll find much here to stimulate you.

* *Opera: Passion, Power and Politics* runs at the Victoria and Albert Museum until February 25. ●

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"A stream of consciousness earworm so evocative there's a whiff of bagels!"



Martin Pipe

I've just returned from a cycling tour of Holland, a country built around bikes. Highlights included friendly and healthy people, riding across the 32km Afsluitdijk, cheese-shops, purpose-designed cycle-tracks ('fietspads'), staying overnight in Haarlem with river-side view for 20€ (thanks to the Vrienden op des Fiets organisation), a smartphone-free cafe in Hindeloopen (just face-to-face chatting and laughing!), medieval Kampen (stunning at night, viewed from the opposite side of the IJssel river), canalside restaurants, a lively Saturday market in Gouda and Utrecht's gothic Dom Tower.

The carillons of Holland's clock-towers play tunes every quarter-hour. Maybe the Dutch are sick of the sound but to us strangers it was literally music to our ears; I recorded some for posterity. Holland has hi-fi shops, but most were closed by the time we arrived in their respective towns. I did get a chance to visit one in Gouda, though. The independent 'Free Music' started selling records in 1968. Seven years later, it branched into equipment to play them on.

There are two sections – hi-fi on one side and music (vinyl and CDs) on the other. Brands stocked include Marantz, Ortofon, Naim, Pro-Ject, Arcam, Linn, Dynaudio and Mark Levinson. Against a musical backdrop of Nick Cave, the assistant explained that "40%" of the music she sold was in LP format.

On Dutch radio, playing in a cafe we visited later, I could hear Godley and Creme's unmistakable 'Under Your Thumb'. By coincidence, I featured the inventive ex-10cc partnership's 'Consequences' triple-LP last month – and lamented the absence of a 40th-anniversary reissue.

No sooner had I filed that column than I got wind of a five-CD G+C set, 'Body of Work - 1978-1988' (Caroline/Polydor, £25).

This package doesn't alas include *Consequences*. "It's all about the rights, I believe" the PR told me when queried. What you do get are the duo's Polydor studio albums 'L', 'Freeze Frame', 'Ismism', *Birds of Prey*, 'History Mix Vol. 1', 'Goodbye Blue Sky' and a 'bonus' disc (check out 'Welcome to Breakfast Television!'), in a small presentation box with booklet documenting their album-by-album recollections. Here we discover that Creme "loved doing" *Consequences*, and that Godley was upset on realising, about "three-quarters of the way through recording, that (they) had missed the boat".

'L' (1978), an allusion to 'L' plates because they had to "learn their chops all over again", was their second release beyond 10cc. G+C had evidently been listening to plenty of Frank Zappa, as his influence is obvious in tracks like 'This Sporting Life' and 'Foreign Accents'. Zappa even gets name-checked in 'Art School Canteen'. The record does however pick up from where 'Consequences' left off, as regards its Gizmo usage.

Their 1979 follow-up 'Freeze Frame' kicks off with 'Englishman in New York'. This stream-of-consciousness earworm, set against a drum-machine driven backdrop punctuated by brass stabs, vibes and a simple synth bassline, is so evocative there's a whiff of bagels! In the accompanying self-directed music-video, Godley croons into a mike while Creme directs a big-band of motorised mannequin.

Clever writing percolates *Freeze Frame*. The lilting 'Get Well Soon' takes us away from Zappa in a definite British direction. Recounting

the tale of a man relying on AM radio for entertainment whilst convalescing from flu, it includes such lines as "I wrote away to Radio Caroline/I need to hear your saddest reggae song/And I'll wallow like a zombie in it/Tear up my Ipi Tombi ticket/Let chocolate buttons limbo under my tongue". Genius!

Featuring backing vocals from one P. McCartney, the track employs Gizmo to recreate radio atmospherics. The piece that precedes it, 'I Pity Inanimate Objects', sees Creme treating his partner's vocal with a studio pitch-shifting device known as a harmonizer. The effect anticipates by twenty years the Autotuning of Cher's voice in 'Believe'.

Technology became even more prevalent on 1981's 'Ismism'. There was little Gizmo on 'Freeze Frame' and none at all here, the duo now making more use of synthesisers and electronic percussion. Both play a key part in the aforementioned 'Under Your Thumb'.

1983's 'Birds of Prey' flew from musical quirkiness to more conventional songwriting but the lyrics are as strong as ever. 'History Mix...' (1985), a reworking of earlier songs (including 10cc material), also featured their former bandmates, production supremo Trevor Horn and the Art of Noise's J. J. Jeczalik. Final outing 'Goodbye Blue Sky' (1988) deals with contemporary themes of nuclear war and environmental deterioration. Ending with the redemptively-optimistic gospel of 'Desperate Times', it's full of the beautiful vocal harmonies and superb production that define their other work.

Holland was a great holiday experience then, and even whilst there I couldn't get away from hi-fi and the influence music has on me – even in a Dutch cafe. ●



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"It is not Class D amplification that causes problems but building its power supply"



Dave Tutt

I am a little worried about progress in the world of audio. Over the years I have seen several changes both in hi-fi and my other main servicing business of musical instruments and amplification which may indicate a general issue that as yet isn't clearly understood. Perhaps I should explain.

When I first encountered Class D amplification it was in a little module made by B&O in a PA speaker, a stage monitor wedge with a rating of around 100 Watts. This little unit was in truth quite amazing. When the wedge arrived it seemed dead due to the power supply falling to pieces from vibration – but what was even more fascinating was that there were 4 or 5 capacitors rattling around in the box, yet once the power supply had been fixed it still worked! No other unit I have seen before or since would survive with that many bits off and still keep going. A sign of true long term reliability perhaps? Even the sound for a PA unit wasn't that bad although – obviously not hi-fi.

Probably the first Class D that appeared in commercial equipment was in pianos and synths made by Technics and now at least 20 years old. I have never, so far, had to repair one even though I deal with these things every day.

Class D is generally low current for the given power, tight and fast sounding although some versions don't seem to have the delicacy and subtle traits of high end hi-fi but it is getting better in significant stages.

I have found though that one of the bugs is at very low levels where in some circuits the noise and distortion rises to an unusable level, where a Class A/B would be in Class

A and as clean as a whistle. I must admit though that this is not listening to a hi-fi but to modern active monitor speakers, so my feelings about it may not be an issue for you the reader.

My main concern however is in the actual implementation that seems to be a serious issue in the PA and band equipment side of things which is migrating into the hi-fi world. It is not the Class D amplification itself that causes problems but building its power supply using what is called a switched-mode design. In the last month alone I have had 5 different pieces of equipment beyond economic repair – and all from different manufacturers. It's not exactly cheap stuff either. Bass guitar amps at £800 - £1000 a piece that fail after a year or less with limited low-power home use is not good.

Why do they fail? Well it's rarely during use. They usually just don't switch on the next time you want to use them. Some that do fail do so spectacularly and I wonder what the manufacturers were thinking when they put these things together. A SMPSU (Switch-mode power supply unit) has some very high current density points in the circuits and requires extensive protection, start up, reference and feedback to make it work. Whereas an old fashioned PSU needs a transformer, a bridge rectifier and a pair of capacitors, a SMPSU may have 40-50 components, each of which has to be chosen very carefully. Its chopper transformer is extremely critical and a custom wound and designed part that, as I have found, has hidden failures all of its own. It is easy to make one of these from any number of IC manufacturers design notes but to make one that always works is a

specialist art that, as many of the current builders have or will discover, is something that is well beyond just sticking bits on a printed circuit board.

These power supplies first appeared in the home in the humble TV but are now so ubiquitous they are in everything including every PC, all those horrid wall-wart chargers, inside your microwave and cooker to run the clocks – indeed everywhere.

The difference is that these low power designs have been standard product for a long time but for power amps the issues ramp up considerably. This is especially the case when the requirements of an output stage are considered. If we say that our average amp needs two 35-45 volt supply rails at around 3 amps each plus a pair of 15 volt rails for the preamp circuits and possibly lower voltages for the control logic and switching, then to get this all stable and clean is a challenge. With Class D the issue is more complex still.

Now we have two power supplies chopping either mains or DC power lines to reproduce sound – so what happens when the two latch up? Bang! I have had units that resemble charcoal bricks. Had it been a stage effect it might have been spectacular but for someone using the unit in their lounge this isn't what I would call progress.

So when I see Class D I am acutely aware that not only could the amp itself be totally destroyed but if it has a SMPSU the chances are that there won't be anything left and certainly nothing that an old engineer like me would find worth the effort to do a component level repair. The only option seems to be to do a board swap – but at what cost? ●

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WORLD CLASSICS

Here is our list of the great and good from audio's glorious past, products that have earned their place in hi-fi history. You'll also see some oddities which aren't classic as such, but are great used buys. The year of introduction is given, alongside the original UK launch price.

TURNTABLES

EAT FORTE 2009 £12,500
Lavishly finished two box, two motor turntable with gorgeous Ikeda 407 tonearm bundled. Exceptionally stable and unfussy performer with a relaxed but highly enjoyable gait.



FUNK FIRM VECTOR II 2009 £860
Innovative engineering gives a nimble, pacey and musical sound that's one of the best at the price.

REGA P2 2008 £300
Excellent value for money engineering, easy set up and fine sound.

MICINTOSH MT10 2008 £8,995
Big, expensive, controversially styled and glows more than some might consider necessary, but an astonishingly good performer.

REGA P3-24 2008 £405
Seminal affordable audiophile deck with fine bundled tonearm. Tweakable, and really sings with optional £150 outboard power supply.

ACOUSTIC SOLID ONE 2007 £4,050
Huge turntable, both in terms of sheer mass and sonic dynamics. Fit up to three arms and enjoy, just don't damage your back moving it...

AVID VOLVERE SEQUEL 2007 £4,600
Stylish high end vinyl spinner with industrial strength build quality and a sound to match. Sound is edge-of-the-seat stuff.

MICHELL GYRODEC SE 2005 £1,115
Design icon with superlative build. Sound is beautifully smooth, effortless and exceptionally expansive.

MARANTZ TT-15S1 2005 £1,299
Cracking all in one deck/arm/cartridge combination, this must surely be the best sound plug and play package at this price point.

MICHELL TECNODEC 2003 £579
Superb introduction to Michell turntables - on a budget. Top quality build and elegant design mean it's still the class of the mid-price field.



MICHELL ORBE 1995 £2,500
The top Michell disc spinner remains a superbly capable all rounder with powerful, spacious sound that's delicate and beguiling.

SME MODEL 10A 1995 £4,700
Exquisitely engineered deck and SME V tonearm combo that's an extremely accomplished performer with classical music.

LINN AXIS 1987 £253
Cut-price version of the Sondek with LVX arm. Elegant and decently performing package. Later version with Akito tonearm better.

TECHNICS SL-P1200 1987 £800
CD version of the Technics SL-1200 turntable. Massively built to withstand the rigours of 'pr' use and laden with facilities - a great eighties icon.

ROKSAN XERXES 1984 £550
Super tight and clean sound, with excellent transients. Less musical than the Sondek, but more neutral. Sagging plinth top-plates make them a cubious used buy.

DUAL CS505 1982 £75
Simple high quality engineering and a respectable low mass tonearm made for a brilliant budget buy. Polished, smooth and slightly bland sound.

MICHELL GYRODEC 1981 £599
Thanks to its stunning visuals, this bold design wasn't accorded the respect it deserved. Clean, solid and architectural sound.

TOWNSHEND ROCK 1979 £ N/A
Novel machine has extremely clean and fluid sound. Substantially modified through the years, and capable of superb results even today.

MARANTZ TT1000 1978 £ N/A
Reautiful seventies high end belt drive with sweet and clean sound. Rare in Europe, but big in Japan.



REGA PLANAR 3 1978 £79
Brilliantly simple but clean and musical performer, complete with Acos-derived S-shaped tonearm. 1983 saw the arrival of the RR300, which added detail at the expense of warmth. Superb budget buy.

SONY PS-B80 1978 £800
First outing for Sony's impressive 'Riotracer' electronic tonearm. Built like a tank with a clean and tidy sound, albeit lacking involvement. Scarily complicated and with no spares support - buy with caution!

TRIO LD-7D 1978 £600
The best 'all-in-one' turntable package ever made. Clean, powerful and three-dimensional sound, ultimately limited by the tonearm.

ADC ACCUTRAC 4000 1976 £300
Ronkers 1970s direct drive that uses an infra red beam to allow track selection and programming. More of a visual and operational delight than a sonic stunner.

PIONEER PLC-590 1976 £600
Sturdy and competent motor unit that performs well with a wide range of tonearms. Check very thoroughly before buying due to electronic complexity and use of some now-obsolete ICs.

PIONEER PL12D 1973 £36
When vinyl was the leading source, this bought new standards of noise performance and stability to the class, plus a low friction S-shaped tonearm. Later PL112D was off the pace compared to rivals.



TECHNICS SP10 1973 £400
Seminal Japanese engineering. Sonics depend on plinths, but a well mounted SP10/II will give any modern a hard time, especially in respect of bass power and midband accuracy.

LINN SONDEK LP12 1973 £86
For many, the Brit superdeck; constant mods meant that early ones sound warmer and more lyrical than modern versions. Recent 'SE' mods have brought it into the 21st century, albeit at a price.

ARISTON RD11S 1972 £94
Modern evolution of Thorens' original belt drive paradigm. Scotland's original super-deck was warm and musical, albeit soft. Still capable of fine results today.

GOLDRING LENCO GL75 1970 £15.65
Simple, well engineered motor unit with soft, sweet sound and reasonable tonearm. Good spares and servicing support even today.

GARRARD 301/401 1953 £19
Tremendously strong and articulate with only a veiled treble to let it down.



THORENS TD124 1959 £ N/A
The template for virtually every 1970s 'superdeck', this iconic design was the only real competition for Garrard's 301. It was sweeter and more lyrical, yet lighter and less impactful in the bass.

TO NEARMS

REGA RB251 2009 £136
Capable way past its price point, the new 3-point mount version of the classic RB250 serves up a taut and detailed sound. A little lean for some tastes, but responds well to rewiring and counter-weight modification.

HELIUS OMEGA 2008 £1,595
Stylish and solid lump of arm with fabulous build quality, that turns in a dynamic and weighty performance.

AUDIO ORIGAMI PU7 2007 £1,300
The classic Srynix PU3 updated to spectacular effect. Hand made to order, with any mass, length and colour you care for. Fit, finish and sound truly impressive.



GRAHAM PHANTOM 2006 £3,160
Sonically stunning arm with magnificent bass dexterity and soundstaging. Build quality up to SME standards, which is really saying something!

TRI-PLANAR PRECISION 2006 £3,600
Immaculate build, exquisite design and one of the most naturally musical and lucid sounds around.

MICHELL TECNOARM A 2003 £442
Clever reworking of the Rega theme, using blasting, drilling and rewiring!

SME 309 1989 £767
Mid-price SME comes complete with cost-cut aluminium armtube and detachable headshell. Tight, neutral sound with good tonality, but lacks the IV's pace and precision.

NAIM ARO 1987 £1,425
Charismatic unipivot is poor at frequency extremes but sublime in the midband; truly emotive and insightful!

SME SERIES V 1987 £2,390
Vice-like bass with incredible weight, ultra clear midband and treble astound, although some don't like its matter of factness!

NAIM ARO 1986 £875
Truly endearing and charismatic performer - wonderfully engaging mid-band makes up for softened frequency extremes.



ALPHASON HR100S 1981 £150
First class arm, practically up to present-day standards. Buy carefully, though, as there is no service available now. Totally under priced when new, exceptional!

SME SERIES III 1979 £113
Clever variable mass design complete with Titanium Nitride tube. Tried to be all things to all men, and failed. Charming nonetheless, with a warm and inoffensive sound.

TECHNICS EPA-501 1979 £ N/A
Popular partner for late seventies Technics motor units. Nice build and Titanium Nitride tube can't compensate for middling sound.

LINN ITTOK LVII 1978 £253
Japanese design to Linn specs made for a musical, rhythmic sound with real dynamics. The final LVIII version worth seeking out.

AUDIO TECHNICA AT 1120 1978 £75
Fine finish can't compensate for this ultra low mass arm's limited sonics - a good starter arm if you've only got a few quid to spend.

HADCOCK GH228 1976 £46
Evergreen unipivot with lovely sweet, fluid sound. Excellent service backup.

ACOS LUSTRE GST-1 1975 £46
The archetypal S-shaped seventies arm; good, propulsive and involving sound in its day, but ragged and undynamic now.

SME 3009 1959 £18
Once state of the art, but long since bettered. Musical enough, but weak at frequency extremes and veiled in the midband. Legendary serviceability and stunning build has made it a cult, used prices unjustifiably high.

PHONO STAGES

CREEK OBH-8 SE 1996 £180
Punchy, rhythmic character with oodles of detail makes this a great budget audiophile classic. Partner with a Goldring G1042 for an unbeatable budget combination.

MICHELL ISO 1988 £ N/A
This Tom Evans-designed black box started the trend for high performance offboard phono stages. Charismatic, musical and punchy - if lacking in finesse.



LINN LINNK 1984 £149
Naim-designed MC phono stage built to partner the original Naim NAIT - yes, really! Fine sound, although off the pace these days.

INTEGRATED AMPLIFIERS

NAIM NAIT XS 2009 £1,250
With much of the sound of the Supernait at half the price, this is powerful, articulate and smooth beyond class expectations.

MUSICAL FIDELITY PRIMO 2009 £7,900
Seriously expensive, but one listen explains why. Wonderfully exuberant sound that can only come from a top quality tube design.

SUGDEN A21A S2 2008 £1,469
Crystalline clarity, dizzying speed and forensic detailing. Power limited so needs sensitive speakers.

CREEK OBH-22 2008 £350
Brilliant value budget passive, with remote control, mute and input switching, plus an easy, a neutral sound.

CAMBRIDGE 840A V2 2007 £750
Version 2 addresses version 1's weaknesses to turn in a mightily accomplished performance, offering power, finesse and detail.

SUGDEN IA4 2007 £3,650
Goodly amount of Class A power, icy clarity and a breathtakingly fast, musical sound make this one of the very best super-integrateds.

NUFORCE P-9 2007 £2,200
Impressive two box preamp with superb resolution and an engaging sound.

MELODY PURE BLACK 101D 2007 £3,295
The clarity and openness of valves plus firm grip and fine detail make this a preamplifier masterpiece.

AUDIOLAB 8000S 2006 £400
In another life, this sold for three times the price, making it a stand-out bargain now. Very clean, powerful and tidy sound.

MCINTOSH MA6800 1995 £3735
Effortlessly sweet, strong and powerful with semi-styling to match.

DELTEC 1987 £1900
Fast, dry and with excellent transients, this first DPA integrated is the real deal for eighties obsessives. Ridiculously punchy 80W per channel from a tiny, half-size box. Radical, cool and more than a little strange.

EXPOSURE VII/VIII 1985 £625
Seminal pre-power, offering most of what Naim amps did with just that little bit extra smoothness. Lean, punchy and musical.



AUDIOLAB 8000A 1985 £495
Smooth integrated with clean MM/MC phono stage and huge feature count. Extremely reliable, too. Post '93 versions a top used buy.

VTL MINIMAL/50W MONOBLOCK 1985 £1,300
Rugged, professional build and finish allied to a lively and punchy sound (albeit with limited power) make them an excellent used buy.

MUSICAL FIDELITY A1 1985 £350
Beguiling Class A integrated with exquisite styling. Questionable reliability.

MISSION CYRUS 2 1984 £299
Classic 1980s minimalism combines arresting styling with clean, open, lively sound. Further upgradeable with PSX power supply.



NAIM NAIT 1984 £350
Superb rhythms and dynamics make it truly musical, but tonally monochromatic. Fine phono stage, very low power.

CREEK CAS4040 1983 £150
More musical than any budget amp before it; CAS4140 loses tone controls, gains grip.

MYST TMA3 1983 £300
Madcap eighties minimalism, but a strong and tight performer all the same.

ROTEL RA-820BX 1983 £139
Lively and clean budget integrated that arguably started the move to minimalism.

NAD 3020 1979 £69
Brilliantly smooth, sweet and punchy at the price and even has a better phono stage than you'd expect. The archetypal budget super-amp.

ROGERS A75 1978 £220
Lots of sensible facilities, a goodly power output and nice sound in one box. The later A75II and A100 versions offered improved sonics and were seriously sweet.

A&R A60 1977 £115
Sweet and musical feature-packed integrated; the Audiolab 8000A remains a classic.



SUGDEN C51/P51 1976 £130
Soft sounding early Sugden combo with a plethora of facilities and filters. A sweet and endearing performer but lacking in power and poor load driving ability.

SUGDEN A21 1969 £ N/A
Class A transistor integrated with an eminently likeable smoothness and musicality. Limited inputs via DIN sockets.

ROGERS CADET III 1965 £34
Sweet sounding valve integrated, uses ECL86 output valves, even has a half useable phono stage, sweet, warm a good introduction to valves.

CHAPMAN 305 1960 £40
Smooth pre/power combo with a sweet and open sound. Not quite up to Leak/Quad standards but considerably cheaper secondhand.

POWER AMPLIFIERS

ELECTROCOMPANIET NEMO 2009 £4,995 (EACH)

Norwegian power station as cool as a glacier tonally, yet impresses with sheer physicality and fleetness of foot. 600W per channel.

NUFORCE REFERENCE 9SE V2 2006 £1,750
Brilliant value for money monoblocks with massive power and super-clean, three dimensional sound.

QUAD II-80 2005 £6,000 PER PAIR

Quad's best ever power amplifier. Dramatic performer with silky but dark tonality, blistering dynamics, serious power and compellingly musical sound.



QUAD 909 2001 £900
Current-dumper has a smooth and expansive character with enough wallop to drive most loads. Not the most musical, but superb value all the same.

NAIM NAP 500 2000 £17,950
Flagship amplifier will drive just about any speaker with ease. Factor in the company's trademark pace, rhythm and timing and it all adds up to one effortlessly musical package.

MARANTZ MODEL 9 1997 £8000
Authentic reproduction monoblocks still more than cut the sonic mustard. Highly expensive and highly sought after.

MICHELL ALECTO 1997 £1989
Crisp, clean and beautifully controlled with gorgeous styling. Partnered with the £1650 Orca this sounds delicious!



MUSICAL FIDELITY XA200 1996 £1000
200W of sweet smooth transistor stomp in a grooved tube! Under-rated oddity.

PIONEER M-73 1988 £1,200
Monster stomp from this seminal Japanese power amplifier, complete with switchable Class A and Class B operation. Clean, open and assured sounding, albeit a tad behind the pace on high speed dance music. Rosewood side cheeks and black brushed aluminium completes the experience.

KRELL KMA100 II 1987 £5,750
Monoblock version of the giant KSA-100 is one of the seminal 80s transistor power amplifiers. Massive wallop allied to clean and open Class A sound makes this one of the best amplifiers of its type.

RADFORD STA25 RENAISSANCE 1986 £977
This reworking of Radford's original late sixties design was possessed of a wonderfully rich, old school valve sound with enough power (25W) and lots of subtlety.

QUAD 405 1978 £115
The first of the current dumpers is a capable design with smooth, effortless power and a decently musical sound. 606 and 707 continue the theme with greater detail and incision.

HH ELECTRONICS TPA-50D AMPLIFIERS 1973 £110
Simple design with easily available components, solid build quality and fine sound make for a surprisingly overlooked bargain.

LECSO AP1 1973 £ N/A
Madcap cylindrical styling alluded to its "tower of power" pretensions, but it wasn't. Poor build, but decently clean sounding when working.

QUAD 303 1968 £55
Bullet proof build, but woolly sound. Off the pace, but endearing nonetheless. Some pipe smoking slipper wearers swear by them!

LEAK STEREO 20 1958 £31
Excellent workaday classic valve amplifier with decent power and drive. Surprisingly modern sounding if rebuilt sympathetically. Irrepressibly musical and fluid.



LEAK STEREO 60 1958 £N/A
Leak's biggest valve power amp offers 35 Watts per channel and more low end welly than the smaller Stereo 20. Despite concerns over reliability rarty value means high price.

QUAD II 1952 £22
The all-time classic valve amplifier, with a deliciously fluid and lyrical voice. In other respects though, it sounds hopelessly dated. Low power and hard to partner properly.



LEAK POINT ONE, TL10, TL12.1, TL12 PLUS 1949 £28
Early classics that are getting expensive. Overhauling is de rigueur before use, using original parts if possible. Surprisingly crisp and musical. Deeply impressive in fine fettle.

PRE AMPLIFIERS

AUDIOLAB 8000C 1991 £499
Tonally grey but fine phono input and great facilities make it an excellent general purpose tool.



CROFT MICRO 1986 £150
Budget valve pre-amp with exceptionally transparent performance.

CONRAD JOHNSON MOTIV MC-8 1986 £2,500
Minimalist FET-based preamplifier is brilliantly neutral and smooth with a spry, light balance in the mould of Sugden. Something of a curio, but worthwhile nonetheless.

AUDIO RESEARCH SP-8 1982 £1,400
Beautifully designed and built high end tube pre-amplifier with deliciously sweet and smooth sound. Not the last word in incision or grip.

LINN LK-1 1986 £499
A brave attempt to bring remote controlled user-friendliness to hair-shirt audiophile hi-fi. Didn't quite work, but not bad for under £100.

NAIM NAC 32.5 1978 £ N/A
Classic high end pre. Brilliantly fast and incisive sound that's a joy with vinyl but a tad forward for digital.

LECSO AC-1 1973 £ N/A
Amazing styling courtesy of Allan Boothroyd can't disguise its rather cloudy sound, but a design classic nonetheless.

QUAD 33 1968 £43
Better than the 22, but Quad's first tranny pre isn't outstanding. Responds well to tweaking/ rebuilding though...



LEAK POINT ONE STEREO 1958 £ N/A
Good for their time, but way off the pace these days. Use of EF86 pentode valve for high gain rules out ultra performance. Not the highest-fi!

QUAD 22 1958 £25
The partner to the much vaunted Quad II mono-blocks - cloudy and vague sound means it's for anacrophiles only.

LOUDSPEAKERS

WHARFEDALE DIAMOND 10.3 2010 £290
Great small standmounters for audiophiles on a budget; dry punchy sound with impressive sound-staging at the price.



YAMAHA SOAVO 1.1 2009 £3,000
Musical, transparent with impressive dynamics and cohesion. Excellent build and finish.

USHER BE-10 2009 £10,500
Clever high end moving coil design with immense speed and dizzying clarity allied to epic punch. Needs the best ancillaries to fly, though...



SPENDOR A5 2009 £1,695
Multi-talented floorstanders with generous scale and punch and Spendor's classic mid-range detail. Deliver a sound that thoroughly engages whatever you care to play.

MONITOR AUDIO PL100 2008 £2,300
The flagship 'Platinum' series standmounter has a lovely warm and delicate sound with superlative treble.



MARTIN LOGAN SOURCE 2008 £1,600
Brilliant entry level electrostatics, giving a taste of loudspeaker esoterica for the price of most moving coil boxes. Tremendous clarity, evenness and delicacy, although not the world's most powerful sound.

PMC OB11 2008 £2,950
Cleverly updated floorstanders give scale and solidity in slim and well finished package.

ISOPHON GALILEO 2007 £2,100
Big standmounters that really grip the music and offer quite startling dynamics and grip.

ONE THING AUDIO ESL57 2007 £1,450
One Thing Audio's modifications keep the good old ESL57 at the very top of the game.

MOWGAN AUDIO MABON 2007 £3,995
Massively capable loudspeakers that offer dynamics, scale and clarity in an elegantly simple package. Wide range of finishes, too.

B&W BEOLAB 9 2007 £5,000
Technically impressive and visually striking loudspeakers with sound quality that more than matches their looks.



ISOPHON CASSIANO 2007 £12,900
Drive units featuring exotic materials allied to superlative build quality result in an immensely capable loudspeaker. Not an easy load to drive, however.

B&W 686 2007 £299
Baby standmounters offer a sophisticated and mature performance that belies both their dimensions and price tag.

QUAD ESL-2905 2006 £5,995
The old 989 with all the bugs taken out, this gives a brilliantly neutral and open sound like only a top electrostatic can; still not a natural rock loudspeaker, though.

B&W 801D 2006 £10,500
In many respects, the ultimate studio monitor; dazzling clarity and speed with commanding scale and dynamics.



REVOLVER CYGNIS 2006 £5,999
Revolver pull out all the stops and show what they can do with this magnificent flagship loudspeaker. A superb monitor that is like a mini B&W 801D in many ways.

USHER BE-718 2007 £1,600
Beryllium tweeters work superbly, allied to a fast and punchy bass driver. The result is subtle, smooth and emotive.

USHER S-520 2006 £350
Astonishingly capable budget standmounters that offer detail and dynamics well beyond their price and dimensions.

ACOUSTIC ENERGY AE1 CLASSIC 2006 £845
Brilliantly successful remake of an iconic design; not flawless, but surely one of the most musical loudspeakers ever made.



MISSION X-SPACE 1999 £499
The first mass production sub and sat system using NXT panels is a sure-fire future classic - not flawless, but a tantalisingly unboxy sound nevertheless!

MISSION 752 1995 £495
Cracking Henry Azima-designed floorstanders combined HDA drive units and metal dome tweeters with surprisingly warm results. Benign load characteristics makes them great for valves.

TANNOY WESTMINSTER 1985 £4500
Folded horn monsters which sound good if you have the space. Not the last word in tautness but can drive large rooms and image like few others.



CELESTION SL6 1984 £350
Smallest two way design complete with aluminium dome tweeter and plastic mid-bass unit set the blueprint for nineteen eighties loudspeakers. Very open and clean sounding, albeit course at high frequencies and limp in the bass. Speakers would never be the same again...

HEYBROOK HB1 1982 £130
Peter Comeau-designed standmounters with an amazingly lyrical yet decently refined sound. Good enough to partner with very high end ancillaries, yet great with budget kit too. A classic



QUAD ESL63 1980 £1200
An update of the ESL57, with stiffer cabinets. Until the 989, the best of the Quad electrostatics.

MISSION 770 1980 £375
Back in its day, it was an innovative product and one of the first of the polypropylene designs. Warm, smooth, clean and powerful sound.

ACOUSTIC RESEARCH AR18S 1978 £125
Yank designed, British built loudspeaker became a budget staple for many rock fans, thanks to the great speed from the paper drivers, although finesse was most definitely not their forte...

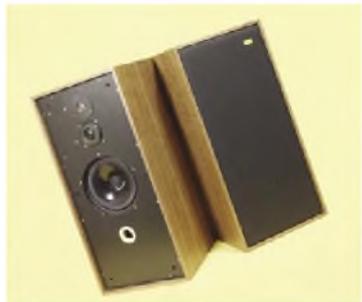
YAMAHA NS1000 1977 £532
High tech Beryllium midband and tweeter domes and brutish 12" woofers in massive sealed mirror image cabs equals stunning transients, speed and wallop allied to superb transparency and ultra low distortion. Partner carefully!



JR 149 1977 £120
Cylindrical speaker was ignored for decades but now back in fashion! Based on classic KEF T27/B110 combo as seen in the BBC LS3/5a. Doesn't play loud, needs a powerful transistor amplifier, but has clarity and imaging.

KEF R105 1977 £785
Three way Bextrene-based floorstander gave a truly wideband listen and massive (500W) power handling. A very neutral, spacious and polite sounding design, but rhythmically well off the pace.

SPENDOR BC1 1976 £240
Celestion HF1300 tweeter meets bespoke Spendor Bextrene mid-bass unit. The result is a beautifully warm yet focussed sound. A little bass bloom necessitates careful low-stand mounting.



IMF TLS80 1976 £550
Warm and powerful 1970s behemoth with transmission loading and a mixture of KEF and Celestion drive units. Impressively physical wideband sound but rhythms not a forte

HH ELECTRONICS TPA-50D AMPLIFIERS 1973 £110
Simple design with easily available components, solid build quality and fine sound make for a surprisingly overlooked bargain. Not exactly stylish, however

BBC LS3/5A 1972 £88
Extremely low colouration design is amazing in some respects – articulation, stage depth, clarity – and useless in others (both frequency extremes). Came in wide variety of guises from various manufacturers building it under licence

LEAK SANDWICH 1961 £39 EACH
Warm sounding infinite baffle that, with a reasonably powerful amplifier can sound quite satisfying.

QUAD ESL57 1956 £45 EACH
Wonderfully open and neutral sound puts box loudspeakers to shame. Properly serviced they give superb midband performance, although frequency extremes less impressive. Ideally, use in stacked pairs or with subwoofers and supertweeters.

SYSTEMS

MERIDIAN SOOLOOS 2.1 2010 £6,990
Crisp styling, bright, colourful touchscreen, plus excellent search facilities. This is one hard disk music system with a difference. Best partnered to Meridian active loudspeakers



NAIM UNITIQUE 2010 £995
Great little half width one-box system with truly impressive sound allied to a wealth of source options

ARCAM SOLO MINI 2008 £650
Half the size and two-thirds the price of a full-sized Solo, the Mini gives very little away in terms of performance to its bigger brother

MERIDIAN F80 2007 £1,500
Fantastically built and versatile DVD/CD/DAB/FM/AM unit, designed in conjunction with Ferrari. Ignore nay-sayers who sneer that it isn't a 'proper' hi-fi product. Just listen.

SHANLING MC-30 2007 £650
Quite possibly the cutest all-in-one around with fine performance from the CD player, tuner and MP3 player input. Very low power, though.



AURA NOTE PREMIER 2007 £1,500
Lovely shiny CD/tuner/amplifier with fine sound quality and dynamic abilities.



MARANTZ 'LEGEND' 2007 £22,000
The combination of SA-7S1 disc player, SC-7S2 preamp and MA-9S2 monoblocks delivers jaw-dropping performance.

ARCAM SOLO NEO 2006 £1,100
Excellent all-in-one system, with a warm, smooth and balanced sound to match the features and style.

PEACHTREE AUDIO IDECCO £1,000
Excellent sounding iPod dock, impressive DAC and fine amplifier section make this an excellent one box style system.



TUNERS

ARCAM FMJ T32 2009 £600
Excellent hybrid FM/DAB+ tuner with a smooth, engaging sound. Factor in its fine build and it's a super value package



MAGNUM DYNALAB MD-100T 2006 £1,895
One of the best ways to hear FM that we know; superbly open and musical sound in a quirky but characterful package

MYRYAD MXT4000 2005 £1,000
Sumptuous sound and top-notch build quality make for a tempting AM/FM package. Warm and richly detailed on good-quality music broadcasts.

NAIM NAT03 1993 £595
The warm, atmospheric sound is further proof of Naim's proficiency with tuners.

CREEK CAS3140 1985 £199
Excellent detail, separation and dynamics - brilliantly musical at the price. T40 continued the theme...

QUAD FM4 1983 £240
Supreme ergonomics allied to a pleasingly lyrical sound with plenty of sweetness and detail made this one of the best tuners around upon its launch



NAD 4040 1979 £79
Tremendously smooth and natural sound allied to low prices and good availability make this budget analogue esoterica.

MARANTZ ST-8 1978 £353
Marantz's finest radio moment. Warm, organic sound plus an oscilloscope for checking the signal strength and multipath

YAMAHA CT7000 1977 £444
Combines sleek ergonomics, high sensitivity and an explicit, detailed sound.

SONY ST-5950 1977 £222
One of the first Dolby FM-equipped tuners, a format that came to nought. Still, it was Sony's most expensive tuner to date, and boasted good sound quality with brilliant ergonomics.



ROGERS T75 1977 £125
Superb mid-price British audiophile design, complete with understated black fascia. Smooth and sweet with fine dimensionality.

SANSUI TU-9900 1976 £300
A flagship Japanese tuner. It boasts superlative RF performance and an extremely smooth and lucid sound.



TECHNICS ST-8080 1976 £180
Superb FM stage makes for a clean and smooth listen

REVOX B760 1975 £520
The Revox offers superlative measured performance although the sound isn't quite as staggering as the numbers. Fine nonetheless, and surely the most durable tuner here?

SEQUERRA MODEL 1 1973 £1300
Possibly the ultimate FM tuner. Massive in terms of technology, size and features dedicated to extracting every ounce of performance from radio, including impressive multi-purpose oscilloscope display

LEAK TROUGHLINE 1956 £25
Series I an interesting ornament but limited to 88-100MHz only. II and III are arguably the best-sounding tuners ever. Adaptation for stereo easy via phono multiplex socket. Deliciously lucid with true dimensionality

HEADPHONE AMPLIFIERS

GRAHAM SLEE NOVO 2009 £255
Dynamic headphone amplifier with a great sense of timing. Crisp, clear treble and warm midrange gives an involving sound.



MUSICAL FIDELITY X-CAN V8 2008 £350
Open and explicitly detailed sound plus serious bass wallop. A great partner for most mid-to-high end headphones.

CD PLAYER/RECORDERS

MUSICAL FIDELITY TRIVISTA 2002 £4000
When playing SACDs, the sweetest, most lucid and lyrical digital disc spinner we've heard. Old school stereo, pure DSD design. CD sound is up in the £1000 class, too! Future classic.

MARANTZ SA-1 2000 £5,000
The greatest argument for SACD. This sublime Ken Ishiwata design is utterly musically convincing with both CD and SACD, beating most audiophile CD spinners hands down.



SONY MDS-JE555ES 2000 £900
The best sounding MD deck ever, thanks to awesome build and heroic ATRAC-DSP Type R coding.

PIONEER PDR-555RW 1999 £480
For a moment, this was the CD recorder to have. Clean and detailed.

MARANTZ DR-17 1999 £1100
Probably the best sounding CD recorder made; built like a brick with a true audiophile sound and HDCD compatibility.



CAMBRIDGE AUDIO CD4SE 1998 £200
A touch soft in the treble and tonally light, but outstanding in every other respect.

SONY TCD-8 DATMAN 1996 £599
Super clean sound makes this an amazing portable, but fragile.

LINN KARIK III 1995 £1775
The final Karik was a gem. Superb transport gives a brilliantly tight, grippy dynamic sound, albeit tonally dry.

NAIM CDS 1990 £ N/A
Classic Philips 16x4 chipset with serious attention to power supplies equals grin-inducing sonics.

MARANTZ CD73 1983 £700
A riot of gold brushed aluminium and LEDs, this distinctive machine squeezed every last ounce from its 14x4 DAC - super musical!



MERIDIAN 207 1988 £995
Beautifully-built two-box with pre-amp stage. Very musical although not as refined as modern Bitstream gear. No digital output.

SONY CDP-R1/DAS-R1 1987 £3,000
Sony's first two-boxer was right first time. Tonally lean, but probably the most detailed and architectural sounding machine of the eighties.

CAMBRIDGE AUDIO CD1 1986 £1500
Inspired Stan Curtis redesign of Philips CD104, complete with switchable digital filter. Lean but tight and musical performer.



MERIDIAN MCD 1984 £600
The first British 'audiophile' machine was a sweeter, more detailed Philips CD100. 14x4 never sounded so good, until the MCD Pro arrived a year later.

SONY CDP-701ES 1984 £890
Sony's first bespoke audiophile machine used a 16x2 DAC to provide a clinically incisive sound; supreme build quality allied to the pure unadulterated luxury of a paperback-sized remote control.

YAMAHA CD-X1 1983 £340
Nicely built 16x2 machine with a very sharp and detailed sound; sometimes too much so. Excellent ergonomics, unlike almost every other rival of the time.

SONY CDP-101 1982 £800
The first Japanese CD spinner was powerful and involving. Brilliant transport more than compensated for 16x2 DAC, and you even got remote control!



ANALOGUE RECORDERS

AIWA XD-009 1989 £600
Aiwa's Nak beater didn't, but it wasn't half bad nonetheless. Massive spec even included a 16x4 DAC!

NAKAMICHI CR-7E 1987 £800
The very best sounding Nakamichi ever - but lacks the visual drama of a Dragon.



SONY WM-D6C 1985 £290
Single capstan transport on a par with a Swiss watch, single rec/replay head better than most Naks. Result: sublime.

PIONEER CTF-950 1978 £400
Not up to modern standards sonically, but a great symbol of the cassette deck art nonetheless.

YAMAHA TC-800GL 1977 £179
Early classic with ski-slope styling. Middling sonics by modern standards, but cool nonetheless!

SONY TC-377 1972 £N/A
A competitor to the Akai 4000D open reel machine, the Sony offered better sound quality and is still no slouch by modern standards.

REVOX A77 1968 £145
The first domestic open reel that the pros used at home. Superbly made, but sonically off the pace these days.

COMPACT DISC TRANSPORTS

ESOTERIC P0 1997 £8,000
The best CD drive bar none. Brilliantly incisive, ridiculously over-engineered.

TEAC VRDS-T1 1994 £600
Warm and expansive sound made this a mid-price hit. Well built, with a slick mech.

KENWOOD 9010 1986 £600
The first discrete Jap transport was beautifully done and responds well to re-clocking.

DACs

DCS ELGAR 1997 £8500
Extremely open and natural performer, albeit extremely pricey - superb.

DPA LITTLE BIT 3 1996 £299
Rich, clean, rhythmic and punchy sound transforms budget CD players.

CAMBRIDGE AUDIO DAC MAGIC 1995 £99
Good value upgrade for budget CD players with extensive facilities and detailed sonics.

PINK TRIANGLE DACAPO 1993 £ N/A
Exquisite; the warmest and most lyrical 16bit digital audio we have ever heard.

QED DIGIT 1991 £90
Budget bitstream performer with tweaks aplenty. Positron PSU upgrade makes it smooth, but now past it.

CABLES

MISSING LINK CRYO REFERENCE 2008 £495/0.5M
High end interconnects, with deliciously smooth, open and subtle sound without a hint of edge.

TECHLINK WIRES XS 2007 £20
Highly accomplished interconnects at an absurdly low price. Stunning value for money.

VDR ULTIMATE THE FIRST 2004 £250
Carbon interconnects that help you forget the electronics and concentrate on the music. Miraculous transparency. Tight and tuneful bass mixed with air and space.



WIREWORLD OASIS 5 2003 £99/M
Excellent mid-price design with a very neutral, silky and self-effacing sound. Superb value for money.

TCI CONSTRICTOR 13A-6 BLOCK 2003 £120
Top quality 'affordable' mains outlet block, with fine build and good sonics. Well worth the extra over standard high street specials, which sound coarse and two-dimensional by comparison.

Rumbling in the Jumble

Martin Pipe hunts through the bargains on offer at the latest Audiojumble event in Tonbridge.

The second 'silver jubilee' Audiojumble of 2017, October's event in the Tonbridge Angel Leisure Centre was not quite as well-attended as previous ones. By coincidence the Indulgence Show - billed as the 'luxury audio and lifestyle exhibition' - was taking place up the road in Hammersmith. One Audiojumble visitor we talked to blamed the latter London show, but another wasn't so sure.

The two shows are, after all, very different. Audiojumble is pitched at the 'hands-on' enthusiasts whose 'lifestyles' involve, amongst other things, thumbing through crates of second-hand vinyl and taking chances on cheap 'used' audio that might need attention. Indulgence attendees, on the other hand, are more likely to be affluent brand- and image-conscious consumers.

February's Audiojumble, covered in our May issue, was marked by a flurry of foreign visitors taking advantage of the weak British currency. They could be seen prowling the aisles for prized vintage items that their newly-increased buying power had brought within economic reach. Said gear was loaded onto trolleys that were periodically transferred to transport waiting in the (free!) car park. But this time round, fewer non-English voices could be heard – despite a pound that had since fallen still

further, notably against the Euro.

As a consequence, a lot more desirable gear was left for the 'home' crowd. It was however rather expensive in some cases, possibly in anticipation of the expected overseas buyers. Hardly surprisingly, many prices were slashed over the course of the day. In addition to the 'classics' were electronic components, 'steamera' valved wireless sets, incomplete carcasses for spares or renovation, records, tapes, CDs, books, test equipment, speaker drive-units, accessories and working hi-fi gear of more recent vintage.

Among the latter were tuners,

blasters and personal cassette players), guitar amps and non-audio curio like cameras, toys and mechanical calculators. Something for everybody, then.

Thanks to Audiojumble, real hi-fi does not have to be a rich man's plaything! On top of the many second-hand stalls spread over two halls were the equipment demonstrations in smaller adjacent rooms, dedicated music vendors pandering to varied tastes and a range of refreshments. Add to this heady brew the chance to meet like-minded enthusiasts, and you have the makings of a most enjoyable day.



amps (valve and solid-state), receivers, reel-to-reel/cassette decks, turntables, CD players and speakers. In addition to these we noted ex-broadcast audio, 8-track decks and tapes, DCC software, Minidisc, acoustic gramophones, self-contained record players (stereo and mono), tape recorders, mini systems, car audio, 'old-school' portable stereo (ghetto-

Words: *Martin Pipe*
Pictures: *Adrian Caspersz*

The next Audiojumble takes place on Sunday 18th February 2018 at the Angel Leisure Centre, Tonbridge, Kent TN9 1SF. www.audiojumble.co.uk Hope to see you there!

Big Tannoy speakers employ dual concentric drive units with rear-mounted but electrically-isolated tweeters. They were the original 'point source' transducers. These heavy 254mm specimens were originally mounted above the sub-bass drivers in Kingdom 12 (or 15) cabinets. With crossovers, the pair was being offered for £1,350.



My favourite stall was this charity pile - packed with a huge array of non-working gear of varying vintage; cheap hi-fi opportunities for the technically-minded. CD players, Roberts portable radios and even a Dual automatic turntable were stacked vertically on (and underneath) the table!



Speaker Protection Systems for £15 a set - making sure your amplifier doesn't fry your precious loud-speaker drive units.

Before hi-fi came along in the 1950s, most home listening involved a radiogram, wireless set or record player. Of the latter, Pye's 'Black Boxes' were highly-regarded for their sound quality. They were produced in various forms from the mid-1950s into the 1960s. Here we have an earlier Black Box with rare Oriental detailing and matching table.



A battery-powered British-made Fi-Cord 202 portable tape recorder. Ideal for making recordings of steam trains, folk songs and birdsong on 4in. spools of tape. This, one of the last models produced by the firm, was being offered for £50.



Leak gear was popular in the late 1960s. Here



we see a Trough Line Stereo tuner (basically a Mark 3 with inbuilt decoder to take advantage of stereo broadcasts) and Stereo 30 Plus integrated amplifier in a common housing. Interestingly, the tuner is valved while the amp - which can deliver 15 watts per channel, into 4-ohm speakers - is a solid-state design. £140 was a fair price.

If you're after valves, Audiojumble is the place to be. Many different types, ranging from midget RF types for radio equipment to massive audio output 'bottles', compete for your attention.



Denon's POA-4400A power amps - monoblocks capable of a 160-watt output into 8 ohms - were made between 1989 and 1994. They have both balanced and unbalanced inputs - and feature Denon's proprietary Class A circuit topography. Amongst other things, this relies on an output stage with 4 sets of transistors in parallel. In full working order and original packaging, this pair were offered for £800.



vinyl section

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AUDIO TECHNICA 700 SERIES CARTRIDGES 84

Noel Keywood reviews Audio Technica's latest upmarket Moving Magnet cartridges

STYLUS GEOMETRY 90

What is the importance of stylus shape? Noel Keywood explains this obscure subject, using diagrams from Audio Technica.

news

TIME TO ROCK

Rock from all comers, this month. From Music on Vinyl comes the Vanilla Fudge/Amboy Dukes supergroup, Cactus' 'One Way...Or Another' (1971) with solid hard rock grooves.

Comus' 1971 debut, 'First Utterance' is succinct, edgy, haunting and dark folk-rock. Vinyl that is one tiny step from pure madness.

From Paradise Lost, 'Medusa' (Nuclear Blast; www.nuclearblast.de) is a new release packed full of sorrow, distress and downright misery. Not quite glorious but not far off.

From Scope (www.kscopemusic.com) is White Moth Black Butterfly's 'Atone', a downtempo collection of synth-draped, chart-friendly, slightly insipid, pop/rock. Also look out for two Rhino releases: 'Brian Wilson Anthology' that covers the legend's solo ventures over two LPs and guitarist Ronnie Montrose's '10x10' with a heap of guest vocalists including Sammy Hagar, Glenn Hughes and Edgar Winter plus guitarists like Joe Bonamassa, Rick Derringer and Phil Collen.



MUSIC ON VINYL

Expect a heap of vinyl from MOV (www.musiconvinyl.com) during the Christmas build-up. We start with Huey Lewis and the News' 'Collected' hits compilation via a 2-LP, numbered, limited-edition on red vinyl. Includes 'The Power of Love'.

From rock/pop to jazz rock and Soft Machine's 'Seven' (1974) mixing modal jazz with fuzzy, dreamy psychedelia.

The Brothers Johnson's 'Right on Time' (1977), this fortieth anniversary edition features strawberry red vinyl and an eight-page booklet. Excellent Quincy Jones-inspired R&B funk.

From Sarah McLachlan, Mirrorball (1999) is a mirror-shiny live album that's a bit too polished for its own good.

Also look out for backing group specialists and roots reggae pioneers, The Revolutionaries' top quality 'Black Ash Dub' (1980) as well as The Heptones' 'Meet the New Generation' (1972): reggae fans need to have this one.

CHRIS REA

His new gatefold album over two discs, 'Road Songs For Lovers' (BMG) shows the smooth husky voice scraped and draped with age, adding a frailty to the tired and worn presentation. Rich presentation, sincere blues and funky rhythms fuse a solid and textured LP.





REPERTOIRE

Great to see this venerable UK label release more vinyl. We begin with Magna Carta's 'Seasons' of pop/folk rock with fairy tale vocals and skipping through daises rhythms.

'From Here to Mama Rosa' (1970) was Chris Farlowe's take on blues rock and prog, a tangent for this soul shouter. Prog fans should check it out, it's surprisingly effective.

The 'Mk.II' (1969) album from the Mk.II Steamhammer offers a variety of melodies and textures to provide an intriguing suite of early jazz/prog flavours.

Also look out for The Yardbirds 'Live at the BBC 1965-1968' over two discs and Leicester-based Black Widow's 'III' (1972), entering their prog phase complete with organ riffs, vocal harmonies and multi-genre influences.

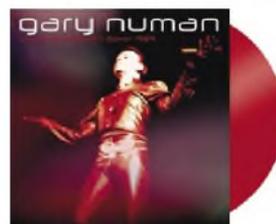


FOUR FROM DEMON

Two intriguing live albums include Gary Numan's 'Live at the Hammersmith Odeon 1989'. From the Skin Mechanic Tour, on red vinyl. The second is Dr Feelgood's 'Live 1990' at Cheltenham Town Hall, on light blue vinyl.

Also look out for the dubious triple album 'T.Rex Mixes' that takes Bolan's masterpieces and overlays...DJ reimaginings. For barrel scrapers and hopeless completists.

Of greater interest is 'Movie Anthems', a double album of artist-created songs, not original soundtracks. This means the likes of Lou Reed's 'Perfect' Day' and Lulu's 'The Man With The Golden Gun'.



PURE PLEASURE

From the UK audiophile outfit (www.purepleasurerecords.com) and Steve Reich's superb 'Drumming' (1987) based, not surprisingly, on a single rhythm which is teased and played with. Minimalist...and not.

To jazz and Thelonious Monk's 'Criss-Cross' (1963) is a small group classic and a sixties highlight mixing his originals and standards to superb effect.

Also look out for Etta James' 'The Right Time', which is polished until it shines... and loses the soul of James in the process.

...AND FINALLY

From Patrick Campbell Lyons (ex-Nirvana, the UK version) 'You're A Cloud, I'm a Comet' ([Market Square](http://www.marketsquare.com); www.marketsquare.com) is a sensitive, thoughtful LP of musings. Almost to himself, we're just lucky to overhear him.

Danny Mulhern's 'Reflections on a Dead Sea' (1631 Recordings; 1631recordings.bandcamp.com) offers moody, atmospheric modern classical works that drag out your emotions like salt on a piece of meat.

Ex-Average White Band men, Hamish Stuart and Steve Farrone are The 360 Band (3msmusic.com). Retaining their funky rhythms, the duo still know how to craft a crafty hook. Lovely.

De Raymondi & Messina 'Saro' (www.zerokilledmusic.com) combines classical structures and electronica to forge grandeur with portent and uplift with a downdraft.

From Matti Bye, 'This Forgotten Land' (*Tona Serenad*; www.tonaserenad.com) is another modern classic LP (they're popular this month) full of haunting piano dynamics, electronic edges and lots of space.

From Gaudi 'Magnetic' (*RareNoiseRecords*; www.rarenoiserecords.com) combines rock, jazz and electronica features Bill Laswell, Tony Levin, Colin Edwin (Porcupine Tree), Roger Eno, Killing Joke's Ted Parsons and more. Rhythmically addictive.

Finally, Alpha Steppa's '3rd Kingdom' (www.steppas.com). Rootsy reggae and dubstep combine with world music to create.





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

Magnetic Attraction

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

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

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

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

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

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

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

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

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

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

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

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



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

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

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

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

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

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



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

Dial A Dealer Directory

directory of Hi-Fi Dealers throughout the UK and Ireland.

The Right Note
Music in the home



BATH

Music in the Home
Tel: +44 (0)1225 874728
Web: www.rightnote.co.uk

Digital: Aurender, Bel Canto, CEC, dCS, Gamut, VerTexAQ.
Vinyl: Aesthetics, Graham, Spiral Groove, Transfiguration
Tuners: Magnum Dynalab
Amplifiers: Aesthetix, Bel Canto, CAT, Gamut, Storm Audio, Vitus, VTL.
Loudspeakers: Avalon, Gamut, Kaiser Acoustics (Chiara & Vivace), NEAT, Totem, Velodyne (Subs)
Cables: Chord Co., DNM, Nordost Siltech, Tellurium, VerTexAQ, Mains Aletheia, VerTex AQ
Supports: Arcici, Black Ravioli, Hi-Fi Racks, LeadingEdge, Stands Unique, VerTex AQ.
Room acoustics: LeadingEdge

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

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



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

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

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

SOUND QUALITY

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

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

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

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

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

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

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

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

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

put a single magnet behind the hinge.

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

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

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

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

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

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

All three cartridges made sonic

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

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

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

CONCLUSION

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

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

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

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

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

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

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

MEASURED PERFORMANCE

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

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

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

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

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

Channel separation was also typical at around 24dB.

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

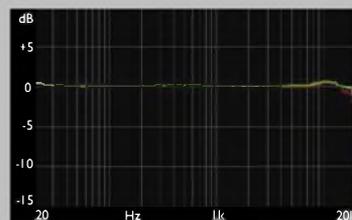
All three stylus assemblies produced similar measured results, and all were class leading. Only the flagship VM7560SLC differed by having a tad more high treble. **NK**

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

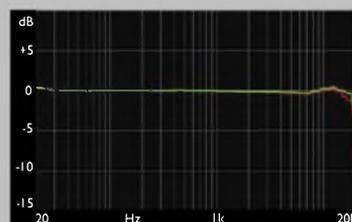
Tracking ability (300Hz)
lateral 90µm
vertical 45µm
lateral (1kHz) 25cms/sec.

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

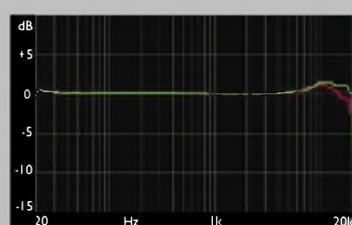
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VMN740ML STYLUS £196



OUTSTANDING - amongst the best.

VERDICT

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

FOR

- clear and detailed
- super low distortion
- bold dynamics

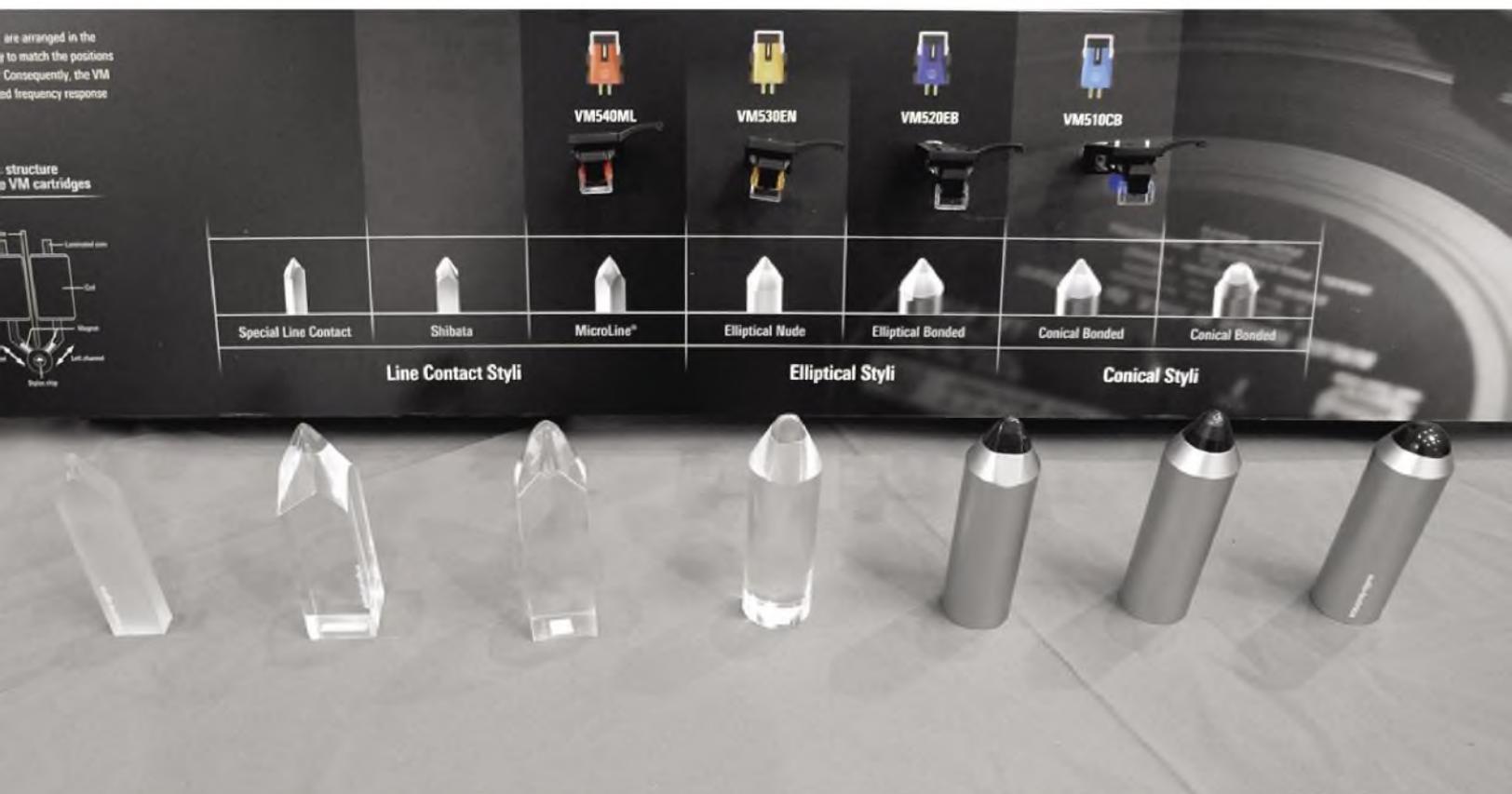
AGAINST

- difficult to fit
- easy stylus misalignment
- poor instructions

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Shaping sound with geometry

Noel Keywood explains how the geometry and shape of a stylus tip can make a big difference to the sound you get from your cartridge.



Before CD, pickup cartridges were functional items, a bit like car tires. You had to have 'em to get round the corner. The stylus in contact with the groove tracking the corners was conical in shape, or elliptical at best – simple geometries that did the job, if imperfectly; a skid would damage the groove!

Nowadays, stylus shape is becoming an ever larger issue and increasingly exotic shapes like Shibata, Fritz Geiger, Fine Line, MicroLine and others are appearing in specifications, but rarely are these new geometries either illustrated or explained.

But modern stylus shapes do greatly improve sound quality, so here's a short explanation about stylus tip shape and what it means.

Most of the information here comes from Audio Technica. At the California Audio Show this year, at their stand I came across a fascinating display of both traditional and modern geometries created in acrylic models – not something I have seen before (they're very expensive to make, apparently).

Then shortly later at London's Indulgence Show they showed me a book with detailed explanatory diagrams, reproduced here, that clearly illustrate what these

geometries theoretically achieve in terms of mechanical contact.

I know from experience that stylus tip shape has a big influence on sound quality but unless you grind them yourself and have a microscope that can see down to microns in 3D, quite how they differ is difficult to understand. So Audio Technica's diagrams are illuminating and – I thought – fascinating.

As the frequency of a sound cut into the groove of an LP increases, so its wavelength gets shorter – the wiggles in the groove become more closely packed; their corners get tighter. Also, LPs spin at constant speed (angular velocity), causing



Understanding the sizes and shape

of Audio-Technica stylus tips and the contact area in the record groove

Stylus sizes Stylus shape	0,6mil Conical stylus	0,2 x 0,7mil Elliptical stylus	0,3 x 0,7 mil Elliptical stylus	Special Line Contact stylus	Shibata	MicroLine™ stylus
Stylus front view						
Stylus horizontal cross-section						
Dimensions (see horizontal cross section)	R=0,6mil = 15,25µm	R=0,7mil = 17,8µm r=0,2mil = 5,08µm	R=0,7mil = 17,8µm r=0,3mil = 7,6µm	R=40µm r=7µm	R=75µm r=5µm	R=75µm r=2,5µm
Contact surface on record groove (stylus side view)						
Approximative contact dimensions ratio	D1/D2=1	D1/D2=1,85	D1/D2=1,60	D1/D2=2,25	D1/D2=3	D1/D2=6

⁽¹⁾ D2 represents the contact dimension at the horizontal plane while D1 shows the contact dimension at the vertical plane. These two dimensions indicate the contact area between the record groove walls and the stylus tip. D2 must be as small as possible to track small groove variations (high frequency). The total contact area should be as large as possible to minimize record wear and maximize accurate reproduction. The larger the area, the smaller pressure from the cartridge on the record; as opposed to the smaller the area, the more pressure is applied on a specific point of the groove, leading to record wear.

We can see from the above table that the Line Contact and Micro linear shapes offers a smaller horizontal contact area leading to superior precision and high frequency transcription, while offering a larger contact area than conical and elliptical styli due to taller a vertical contact area minimizing record wear.

audio-technica

linear velocity to fall on inner grooves and this shortens wavelength as well, making life even more difficult for the stylus.

A simple spherical stylus, fitted to budget designs, does not trace high frequencies accurately – and the situation gets progressively worse as it travels inward on an LP. Inner groove loss and distortion is the result, causing dullness and muddle.

Sharper tips, meaning those with a smaller side radius, as shown here, read right into the finest details within a groove, giving cleaner and clearer treble that is less muddled and diffuse – all the way into innermost grooves.

They fully retrieve information from inner grooves, right up to 20kHz our measurements show, using the JVC TRS-1007 test disc that has inner groove test tracks to measure this phenomenon.

For a high precision and geometrically effective tip shape to read a groove's wiggles however, it

must be aligned vertically (stylus rake angle), and also in angular orientation relative to the groove – about which little is ever said.

Audio Technica interestingly raise this subject when talking about the stylus shank: a square shank

"Sharper tips read right into the finest details within a groove, giving cleaner and clearer treble which is less muddled and diffuse"

gives more consistent and correct orientation within a laser cut hole on the cantilever.

Older techniques using punched or drilled holes and a stylus ground onto the end of a circular rod that offered no way to ensure correct orientation in the hole. Audio

Technica's more expensive models have square/rectangular shanks to achieve higher accuracy and to better read fine groove detail. You can see square and rectangular shanks in our picture of their models at the California Audio Show.

In a nutshell then, modern stylus shapes give better defined and more extended treble - especially on inner grooves. If a stylus does not read what's in a groove then nothing else can make up for the loss, no matter how sophisticated the rest of the cartridge assembly may be.

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Rock The House

Hewn from granite, Rock HiFi's stands will bring the best from your loudspeakers, says Jon Myles.



Loudspeaker stands come in many shapes and sizes. Some are relatively light, - aiming to transmit excess cabinet energy into their framework to dissipate it. Others are heavy and sturdy looking, to direct that energy into the floor they are standing on.

Into the latter category comes the Rock HiFi range - undoubtedly one of the heaviest stands on the market at the moment. The reason? They are hand-built in Wales from locally-sourced granite. Each pair takes around a week to manufacture.

Unboxing them from their packing crates I was astonished by their weight - some 23.5kg each. They are a fairly standard 600mm tall with a 300mm x 250mm plinth and a 260mm x 220mm top plate - although Rock HiFi founder Martin Legg can produce different sizes to suit your requirements.

He says the idea for the product came after he placed his own 'speakers on granite slabs and realised what a big difference it made to their sound.

The top and bottom plates are connected by a hefty granite column attached by a bolt running through the centre. Four spikes screw into the base and once done they sit perfectly level and look undeniably impressive. The only drawback is moving them around, which takes a bit of effort due to that weight. Once in place, though, there's no

mistaking the fact they provide a firm, stable base for your 'speakers.

SOUND QUALITY

Taking a pair of Spendor A1 'speakers from a standard set of stands and placing them on the Rock HiFi ones quickly revealed how well the latter works.

Soundstage, bass depth and stereo imaging immediately took on a more focussed, revealing and lifelike quality. The stands gave the 'speakers more room to breathe - bringing out their best qualities.

With New Order's 'The Perfect Kiss' the low end came over with extra punch, being firmer and more rounded. That enabled the midband and treble to open up so the whole frequency spectrum seemed extended.

It was the same with everything I played - from opera to jazz to heavy rock. One aspect that was particularly impressive was how

the Rock HiFi supports managed to widen the stereo image - the music extending wider and becoming more enveloping.

As such there's no doubt they are acoustically effective. As an added bonus they also look absolutely gorgeous - not just a loudspeaker stand but also a piece of furniture which will go a long way in the partner acceptance factor stakes!

CONCLUSION

These are a fine set of stands for getting the best out of good standmount loudspeakers. They're not cheap - starting from £750 a pair - but considering they are hand-built, hewn from granite and undeniably effective that's not a bad price to pay. Rock HiFi can also tailor stands to your specific requirements in terms of height and plate sizes with different finishes available, so you are getting a bespoke service.

ROCK HiFi £750



OUTSTANDING - amongst the best.

VERDICT

Stylish and effective. The Rock HiFi stands are probably the firmest support you can find for your treasured loudspeakers.

FOR

- open up soundstage
- provide deeper bass
- look superb

AGAINST

- not cheap

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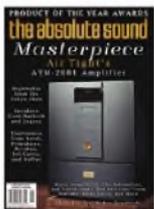
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Unico hybrid integrated amplifier, £600. EAR 834L line pre-amplifier, £600. Both in beautiful condition. Tel: 07505 057 414 anytime or 0207 263 5702 after 7pm

WANTED: TOP quality Hi-Fi separates and complete systems, Naim, Linn, Cyrus etc, fast, friendly response and nationwide collection offered. Please call me on 0781 5892458 or email me at pogsonp@aol.com

ROYD THE MINSTRAL, black ash, floorstanding speakers in excellent condition, £150. Nakamichi DR3 cassette deck, mint condition, £150. Nakamichi 2 cassette deck, mint condition, £100. Nakamichi DR2 deck, mint condition, £260. Tel: 01494 864 969

AKAI GX-95 Reference Master Cassette Deck in pristine condition as it has had little use. £80 with unopened cassette tapes. Collection only Colchester area. Tel: 07762 702570

PROAC RESPONSE 1.5. Burr oak. £400. Resolution Audio Opus 21. Black. £800. Resolution Audio S80. £400. PrimaLuna Prologue 5. Black. Plus KT120 x4. £500. All in good condition. keithpayne@hotmail.co.uk.

RUSS ANDREWS Crystal 24/Kimber 12TC speaker cable, 1m pair with Kimber banana plugs plus super burn in and deep cryogenic upgrades applied rrp £450 - £195. Tel: 01902 884694 Email: jukey39@yahoo.co.uk

AUDIO RESEARCH SPI6L pre-amp in mint condition with instructions and remote control in original box and parking. In excellent condition sound enhancing quality. £995. 07930 121847.

WANTED FAULTY or non working Quad 44 preamp later model preferred. Cash paid. Contact Mike 01758 613790 Evenings.

NAIM UNITIQUITE2, bought from new. Latest Bluetooth version & streamer. Mint condition, fully boxed from new with manuals. Lovely sound. Hardly used & pics available. £980 ono. Buyer collects. Tel: 07711115252

MUSICAL FIDELITY
A3.2 RDS tuner £125. Absolutely spotless, remote, original box. Pet and smoke free home. Kept covered and clean. Beautiful. Michael (Cheshire) Email: imeldayates@hotmail.com Tel: 07500804700

AURALIC ARIES streaming bridge, femto/lpsu, boxed in pristine condition. £950. Audiolab M-DacPlus, excellent boxed condition, remote never used. £600. Contact Rhod, 07928816127, or Email: kenny30@live.co.uk.

NAIM NAT 02 Immaculate. Boxed. Serviced by Naim in past. Offers. Can post. Speaker stands white marble bespoke (Built by a monumental mason) 470mm high 355mm deep 270mm wide. 27.4 Kg. £20 ono. Collect. E Midlands. Pictures available. Changed speakers to a smaller model 07783 327 689, spinkray.rs@gmail.com.

I HAVE over 40 original drivers from Bowers & Wilkins (including DM604), Mission, PMC and Dynaudio. Please Email me on farlizzy@gmail.com for full list.

TANNOY TURNBERRY
GF £2,300. Manley Steelhead RC boxed mint £3000. Garrard 301 In Northwest Analogue Plinth two armboards £2,500 Tel: 07770 772 647

CREEK T40 tuner. Excellent condition. Original box and manual. Smoke-free home use since new. £63 inc. carriage in UK. Tel. 01445 712462 (evenings).

MUSICAL FIDELITY
M1HFA headphone amp, incl preout £180. Canary Audio 601 preamp £500. Resolution Audio Opus 21 CD £700. All vgc. Ideally collection only. 07966 208 204 - andrew.howler10@gmail.com (Leics)

CASSETTE DECKS:
Tandberg TCD 320 £300. Nakamichi 2 £90. Nakamichi BX125E £120. Sony TC-K611S Dolby S £150. Teac W890R Mk2 (4 years guarantee) £140. All mint condition. Tel: 01494 864 969 for demo.

WANTED: AUDIO
Innovations integrated valve amplifier, Elite Rock/Avalon turntable. Kelvin Labs Class A integrated, £295. Audionote Kondo interconnect, £300. Dean Alro's. £150. Leak Troughline Mono. Tel: 0113 255 9475

NEAT MOTIVE I
Loudspeakers
Cherrywood veneer
excellent speakers, excellent sound £600. Tel: Evan 07957 384 795 (London)

NEXT MONTH JANUARY 2018 AWARDS ISSUE

NAIM UNITI ATOM & NAIM UNITI CORE

A two box solution to storing, accessing and playing back music - that's the aim of Naim's latest Atom and Core from the new Uniti range. Featuring a 40 Watts per channel amplifier with streaming capabilities, allied to a dedicated storage device – all you need to do is add loudspeakers. We put it to the test in next month's edition.

Also, we hope to bring you –

Mark Audio Soto Cesti B speakers
Auralic Altair Streaming DAC
Quadral Rodan 9 'speakers
Wharfedale Diamond 11.3 'speakers
Isotek Hi-Res Full System Enhancer & Blue Horizon RIAA Enhancer
Isotek EVO3 Corvus Power Bar
Questyle CMA400i Headphone amp and DAC
Final E2000 & E3000 Earbuds
...and much more.



This is a selection of what we hope to bring you, not a complete list. We regret that due to a wide range of issues, we cannot guarantee that all products listed above will appear.

PICK UP THE JANUARY 2018 ISSUE OF HI-FI WORLD ON SALE 30TH NOVEMBER 2017, OR SUBSCRIBE AND GET IT DELIVERED TO YOUR DOOR: SEE PAGE 54

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JANUARY - 8TH NOVEMBER

FEBRUARY - 5TH DECEMBER

EMERSON, LAKE & PALMER

EMERSON, LAKE & PALMER
1970



"Not just a significant album in terms of the group but also for an entire genre"

For a section of the music-loving public, ELP reflected prog excess and overblown presentation. For punks, they were the epitome of the rock dinosaur. For prog rock fans, though, they were talented, skilled musicians,

supreme interpreters of classical music and rhythms, a supergroup that expanded the prog genre with an ostentation that was a sight to behold.

Their self-titled debut album was one of their very best, combining the balladic highlight 'Lucky Man' with a number of keyboard-lead instrumentals including the attacking style of Keith Emerson. Pretension, if you ever disliked the group for this element of their behaviour, was at a minimum on this LP. What does come to the fore is pure musical talent.

The band's immediate success and the resultant high position in the world's charts for this LP (No.4 in the UK charts, No.20 in the USA) was also down to the audience. Music fans were ready for prog, at that time. As Carl Palmer said to me in an interview I conducted with him more than ten years ago now, "Keith [Emerson] had already done a little bit of that [prog rock] with The Nice and we decided to carry it on as ELP. That Mussorgsky piece [Pictures At An Exhibition] was only, originally, a rehearsal piece, not something we'd even play live. The whole thing was 20 minutes long. When we eventually played it on stage, it was greeted with open arms".

But there was more. And this also set apart the tone and the feeling of this debut piece and prog rock as a genre to a greater (although not exclusive) extent. As Greg Lake told Newsweek, "I think the fundamental thing was that Keith Emerson and myself had this shared belief that too much rock 'n' roll music had been based on the blues, Motown, gospel, country and western—all American-influenced. I hasten to add: Nothing wrong with that; I love American music. At the time, Keith and I agreed that there needed to be something different taking place. And so we decided, really, to use European influences rather than American influences, in our music. And I think that was a common bonding factor that we had, even before Carl joined the band".

Music fans wanted complexity, imagination,

innovation...they wanted to see where songwriting could go. They wanted to see a, well, progressive edge to music. This album gave them that. It also opened the door to a host of other prog groups were waiting to see how the wind was blowing.

You can find this album within a new, large and luxurious box set called 'Fanfare', which re-masters all eleven ELP albums on CD including 'Emerson, Lake & Palmer', 'Pictures at an Exhibition', 'Tarkus', 'Trilogy', 'Brain Salad Surgery', 'Welcome Back My Friends, To the Show that Never Ends', 'Works Volume I and II', 'Love Beach', 'Black Moon' and 'In the Hot Seat'.

You also get a previously unreleased triple album gatefold LP, the wordily titled, 'Live at Velodromo Vigorelli Milan, Italy 4 May 1973 & Stadio Flaminio, Rome, Italy 2 May 1973' and a host of live CDs taking in shows from Long Pond, PA, USA, Stanhope New Jersey, USA to Birmingham Symphonic Hall, UK plus a disc featuring BBC broadcasts including The Old Grey Whistle Test and Pop Goes Summer. You also get two remastered 7" singles with reproduced original sleeve art: 'Lucky Man'/'Knife-Edge' (1970) and 'Fanfare For The Common Man'/'Brain Salad Surgery' (1977), a hard-backed book, promo poster, promo brochure and tour programmes!

Testing this CD version on my reference hi-fi, I was happy to hear the low volume set during mastering. More than that, the low noise has produced an open soundstage so, increasing the gain to a generous volume also aids clarity and emphasises detail insight. This mature approach to CD mastering also means that the upper mids are rich in tone and balanced in nature. There is neither smearing in this region or, indeed, blooming in the lower frequencies which are not emphasised yet form a significant and wholly integral part of the overall mix. That mix was calmly distributed across a spacious and open soundstage that allowed plenty of elbow room for the often complex suite of frequencies on offer to the ear.

Not just a significant album in terms of the group but also for an entire genre, any digital fan will be able to bathe in a wholly professional master via the 'Fanfare' box set. **PR**

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