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## verdicts

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

£



**T**he Mission 770 loudspeaker was a ground breaker way back in the 1970s when most loudspeakers had paper or – at best – Bextrene cones. Think heavy, coloured sound – ponderous too. Then Mission appeared with their first product, the 770. Sporting a translucent drive unit pressed from polypropylene, it looked good and sounded good.

Using the very latest computer design techniques and measuring equipment – explained to me by designer Peter Comeau – this update aims to be even more accurate and revealing than the original. You can read about it on p10.

As regular readers know we rely on measurement to look at fundamental performance and I was pleased to see, when Peter Comeau showed me the 770's measured frequency response it was identical to ours. Since we use an industry standard measuring system (Clio), it was reassuring, since rooms and small anechoic chambers introduce complex errors not easily corrected.

There are various tricks however, such as gated pulses and fast chirps, that – I was surprised to find – are now available in free software Room Equalisation Wizard (REW). Reader Dan Grundy recommends – in Letters on p30 – a YouTube video showing REW and other equipment being used to measure guitar cabinets. Fascinating stuff, even just for all the work put into cabinets of so many shapes and sizes.

Measurement also reveals that, in spite of all the criticism on internet forums, Chinese built turntables are more speed stable than those of the past. The reason is they use modern, dedicated d.c. motors with servo-feedback control circuits, eliminating the speed wander of old a.c. synchronous motors. Couple this with a flat-ground belt rather than a cheap O ring, plus tightly machined bearing with no play in it, and wow has become a thing of the past, as we found with the Lenco LBT-188WA budget turntable you can read about on p71.

Modern computer based measuring systems and ever more sophisticated motors all play a part in helping improve the hi-fi products of today, as we show in this issue. I hope you find it interesting.

**Noel Keywood**  
Editor

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

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

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

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

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



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# news

## MIDDLE C

Pitched at the busy midrange sector of the amplifier market is NAD's latest offering, the £1,299 C389 HybridDigital integrated. Key features include upgradability, courtesy of (irony alert!) the latest 'MDC2' variant of NAD's Modular Design Construction platform, and the similarly-proprietary 'UcD' amplifier technology. NAD tells us that it's using multiple UcD modules in a balanced bridged configuration for 2x 130W (4/8 ohms) output, together with a switched-mode power supply boasting 'ample reserves'.

The C389 also contains a DAC, which is built around the same 32-bit/384kHz ESS Sabre chips you'll find in the firm's Masters Series – chosen on account of their low jitter, wide dynamic range and negligible distortion. From digital sources – optical, coaxial, HDMI ARC, the inevitable Bluetooth and streaming from the relevant BluOS MDC option – you can expect "astonishing clarity and holographic imaging". Analogue-wise there are two line-level sources, an MM phono stage, 6.3mm headphone connectivity and provision for two sets of speakers.

Further details: [www.nadelectronics.com](http://www.nadelectronics.com)



## LOVE TRIANGLE

Evidently intended to fill the gap between 'lifestyle' audio and enthusiast-grade hi-fi are two pairs of elegant, digitally-enabled active speakers from French outfit Triangle. Forming part of the Borea range and available in a choice of five "retro-chic" finishes, the BR02 BT (£499) and slightly bigger BR03 BT (£599) are bass-reflex bookshelf designs.

Both feature auxiliary analogue inputs, subwoofer connectivity, coaxial and optical inputs for digital sources, Bluetooth 5 with aptX HD support and an MM phono stage ready for the matching turntable that will be made for Triangle by Project. The BR02 BT features a 13cm "natural cellulose" pulp-coned bass/mid driver and EFS tweeter driven by 50W per channel of amplification. An updated 16.5mm woofer, slightly increased sensitivity (90dB/m, against 89dB/m) and more powerful (2x 60W) amplifiers are among the benefits the BR03 BT's £100 premium pays for.

Further details: [www.trianglehifi.com](http://www.trianglehifi.com)

## HI-FI SERIOUS

Absolute Sounds, purveyors of tasty exotica, showed off some of its wares at – appropriately enough – the High End 2022 show in Munich. Some of them are part of the exclusive Ten collection, curated by the distributor's founder Ricardo Franassovici. Particularly striking was Hideaki Nishikawa's massive Air Force One Premium turntable. Amongst other things, the belt-driven TechDAS deck incorporates air suspension and vacuum-clamping. It was shown with an Elite Ti 10in tonearm – described as a "Graham Phantom Elite, upgraded with the TechDAS TDTW-01 Ti titanium tonearm wand" – and TechDAS TDC01 Ti cartridge.

The turntable alone costs £120k with aluminium platter (£139k if you want titanium), and the AS PR guru reckons that the combo heard in Munich could set you back as much as £170k, depending on platter. An as-yet unpriced 'S' variant of the Air Force III Premium, with newly-designed suspension feet, was also shown.

Further details: [www.absolutesounds.com](http://www.absolutesounds.com)





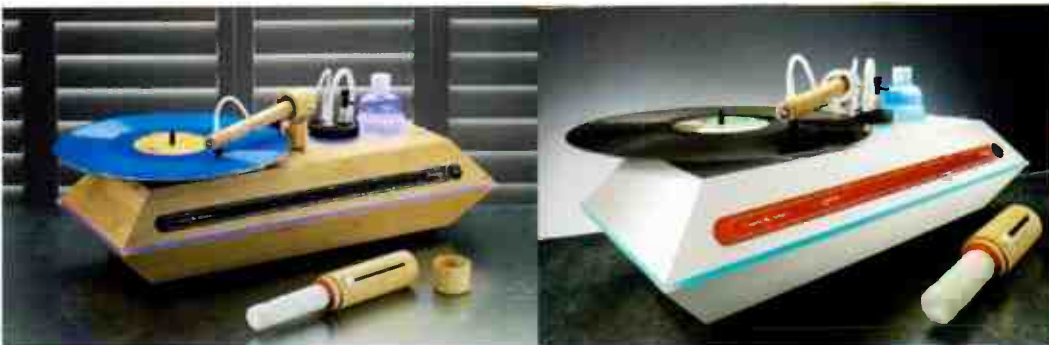
## HEALTHY COMPETITION

Providing an up-to-date alternative to NAD (see elsewhere) is Denon, with its 'premium' £1699 PMA-1700NE integrated amplifier. Like the aforementioned C389, the PMA-1700NE has an in-built DAC – the Denon is however equipped with USB-B port, as well as two optical inputs and a coaxial socket. This allows computer playback of high-resolution digital music (up to 11.2MHz DSD and 32-bit/384kHz

PCM). Also specified is a high-grade phono stage, with provision for MC as well as MM cartridges. Pre-amp inputs enable

the PMA-1700NE's 2x 70W (8 Ohms) power amps, which will accommodate two pairs of speakers, to be driven directly. Denon has also provided a headphone output and (defeatable) tone controls. Also new from the Japanese brand are the PMA-900HNE (£899), a 2x 50W (8 Ohms) integrated amplifier with Denon's HEOS ('Home Entertainment Operating System') streaming platform built in, and the matching DCD-900NE CD/USB player (£499).

Further details: [www.denon.com](http://www.denon.com)



## CLEANING UP

Keith Monks' record-cleaning machines – for a long time a mainstay of broadcasters, hi-fi shops and record libraries – are legendary. One was presented to the Queen during her Silver Jubilee, back in 1977. As part of the cleaning action, they relied on disposable thread. RCMs mostly disappeared after listening went digital, but renewed interest in vinyl encouraged Jon Monks to revive the iconic machines.

The revamped 'Prodigy' line, one of which we've reviewed, is threadless but retains the point-suction concept of the originals. This £1,295 'bamboo' model has been redesigned for lower noise (allegedly, it's so now quiet you can "play a record and enjoy it while cleaning another") while two others have been introduced. These are the Prodigy Blue Deluxe (£1,595) and Galileo Deluxe (£1,595), which combine quieter operation with quicker cleaning (2 minutes per side) and better finishes. We wonder if the Queen received one to celebrate her Platinum Jubilee...

Further details: [www.vinyldiscovery.com](http://www.vinyldiscovery.com)



## PLAYING SOLITAIRE

With the £1200 Solitaire T, T+A's goal is to endow noise-cancelling Bluetooth headphones with genuine audiophile characteristics. Indeed, the complex onboard digital circuitry is built around an ES9218 chip. Such silicon may be found in 'headphone DACs', but as far as we're aware it's the first time one of these ESS Sabre devices has been incorporated into the headphones themselves. Ahead of the ES9218 is a Qualcomm QCC5127 Bluetooth 5 chip, which endows the Solitaire T with support for recent codecs like LDAC and aptX HD. The closed-back design, featuring 42mm transducers with special cellulose diaphragms for "an incredibly lively and dynamic performance" can however also be used in wired mode (the cable is removable). Manufactured from aluminium, high-quality synthetic compounds and vegan 'leather', the housing they're in is available in two colour schemes – white/silver and black/silver. The noise-cancelling mode, interestingly, relies on a combination of passive and active techniques.

Further details: [www.ta-hifi.de](http://www.ta-hifi.de)



## ALL THE FYNE OF THE FAIR

Priced initially "at between £3,500 and £35,000", a range of speakers built around Fyne Audio's flagship IsoFlare point-source drivers was seen (and heard!) for the first time at the Munich High-End show. The Glasgow-based firm's 'Vintage Series' is the work of Dr Paul Mills, a loudspeaker industry veteran of more than 40 years experience.

The three models shown respectively employ 10in, 12in and 15in versions of Fyne's driver, which partners a titanium-domed 75mm compression tweeter, stiff multi-fibre midrange/LF cone with specially-developed FyneFlute surround and neodymium magnet system in a rigid cast-aluminium chassis. These are built into hand-crafted birch-plywood cabinets with twin cavities, the lower of which is ported using Fyne's BassTrax system. Here, low-frequency energy is diffused by a tractrix cone. The main advantage of Fyne's no-compromise approach is its stereo imaging – which is claimed to be "outstanding".

Further details: [www.fyneaudio.com](http://www.fyneaudio.com)

## SILVER-TONGUED

Streaming platforms and renewed interest in analogue cannot magic away the countless millions of silver discs that have provided listening enjoyment since the format was launched four decades ago (yes, it really is that long!) and so it's good to see that 'serious' CD players are still being made.

One of the latest is Marantz's CD60, designed to complement the recently-announced 40n integrated stereo amplifier. In a nod to the present, the CD60 will also play music stored on USB devices. Hi-res WAV, FLAC, ALAC, AIFF (up to 24-bit/192kHz) and DSD (up to 5.6MHz) files are accepted, in addition to MP3, WMA and AAC. Exclusive to Marantz is HDAM (Hyper Dynamic Amplifier Modules) technology, which is found in the analogue output stages and headphone amp. Other features include switchable digital filters, a 'reference-class' DAC and 'high-current' power supply. Sounds like good value for £749.

Further details: [www.marantz.com](http://www.marantz.com)



## GO(LD) BAR

A luxury cigarette lighter? No! It's the sophisticated £329 Go Bar 'headphone DAC' for smartphones and computers, from miniaturisation specialists iFi. Topping the firm's Go series, the 65x22x13mm Bar is claimed to contain the "world's most powerful headphone amp...of its size" (550mW). Balanced (4.4mm jack) and unbalanced (3.5mm) headphones are supported, as are iFi's proprietary 'iEMatch' and 'Turbo' optimisation technologies. The hi-res digital side of the operation is no less noteworthy.

Based around a Cirrus Logic DAC, it features four filtering options, iFi's low-jitter GMT (Global Master Timing) clock and – to process digital audio data from the USB-C port – a 16-core XMOS microcontroller. The 28.5g Bar natively-supports DSD and MQA, derives its power from the host and is operated

Further details: [www.ifiaudio.com](http://www.ifiaudio.com)



via hardware buttons and status LEDs. As well as

## BUT WHERE'S MAJOR TOM?

Computer Audio Design's GCI Ground Control, launched in 2016 with the goal of tackling RF garbage from IT gear and Wi-Fi, as well as the innards of our audio systems, has been upgraded by designer Scott Berry. He believes that although such noise may not be directly-audible, it can nevertheless "change the very personality of sound". Like its predecessor, the £1,995 GCI.1 targets the "signal ground plane", as Berry had discovered that "all is not as it may seem" there...and converts such noise into heat. The GCI.1's methods for achieving this, we're told, are "something of a closely-guarded secret"; compare such secrecy with the rather more open approach taken by Connected Fidelity for its RF Blocker, as reviewed last month.

We are however told that it "involves a highly-complex combination of proprietary materials...technology from aerospace engineering and...ultra-precise internal configuration". The GCI.1 can be connected to any unused input or output terminal; even USB and Ethernet ports are fair game, it's claimed.

Further details: [www.computeraudiodesign.com](http://www.computeraudiodesign.com)







# Historical Mission

Mission revive their original 770 loudspeaker – in modern form. Noel Keywood listens.

**A**t a time when loudspeakers were mostly veneered boxes to blend in with the furniture, Mission came out with the 770 – styled to stand out rather than blend in. The sound was matchingly modern too. It was the company's first product, gained a big reputation and here is an updated re-creation – still called 770 – designed to continue the tradition, price £3500.

The 770 I reviewed long ago and remember little about, except that it wasn't especially large or heavy. The new 770 is – my overriding first impression. This is a substantial stand-mounting speaker, weighing 19.2kg apiece, the cabinet measuring 590mm high, 300mm wide and 300mm deep, excluding the terminals. It's a chunky square shape that, when on its dedicated stands, tops out at 1030mm high – the height of a floor stander. So we're talking big here and with loudspeakers this usually translates to a "big" sound. It did.

The 770 was Mission's first loudspeaker, designed for a brighter, faster, more modern sound than the old paper plodders. I was told this by designer Farad Azima, founder of Mission, in a meeting with him during a heatwave where I quietly melted whilst he was driven by enthusiasm for his first product. Anyway, the 770 went on to be a successful entree into loudspeaker manufacturing (and much else), with a factory in Huntingdon opposite Meridian and near to Quad in the UK's hi-fi heartland.

All of which explains why it has been re-launched in updated form

over 40 years later, as a tribute and as a sympathetic update for those who want a traditional (app-free!) loudspeaker.

The original 770 had a polypropylene cone bass/midrange unit and the new one does too, mineral loaded to form a polypropylene composite with improved properties.

The motor assembly is more sophisticated, having a powerful magnet for greater sensitivity and stronger dynamic ability. In the intervening years computer aided design (CAD) has come to dominate this field, which today's owners of Mission – the International Audio Group (IAG) – use to optimise drive unit behaviour. Things have moved on.

Computers now also optimise cabinet and port behaviour, which the new 770 benefits from. True to the original, the port sits on the front panel, where most now are placed at rear to reduce audibility of box boom. A baffle has been placed behind the port to suppress this effect.

Above the bass/midrange unit sits a 28mm microfibre dome tweeter with rear chamber damping. Slightly larger than the usual 25mm (1in) dome, it has better behaviour below its 2.9kHz crossover frequency, Mission say. Our measurements confirm it runs smoothly up to 20kHz, free from the peaks and dips that come from resonant behaviour, for a smooth clean sound. In keeping with the design ethos of the original, treble level has been kept in line, with no lift to artificially brighten the sound, making the new 770 perfectly accurate. I got to see the internal

crossover network and can confirm it uses top quality, audiophile components, but although the bass and treble sections are physically separated they meet at the input terminals for mono-wiring only.

Although the new 770s are big they are an easy amplifier load and do not need a lot of power, around 40W to go very loud. For those interested in the figures, we measured a loud 87dB from 1W input.

The stands come in their own box and are an Ikea-style assembly job. Stare at the line diagram on single paper sheet with its numbered steps and get twiddling with a hex key and a bag of bits. The result is a light but strong square steel frame with adjustable



*The 770's 28mm microfibre dome tweeter with back damping to suppress resonances in the acoustic chamber. Being large it goes low smoothly.*

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floor cones (not carpet penetrating sharp spikes). There are protective pads for those who would rather not have woodworm-like holes in their floorboards, a problem with all spiked loudspeakers of course. If the visual presence of the large-area front fascia is too much – they loom large – there are black, acoustically transparent grilles that attach with magnets. Getting the speakers onto the stands is a bit of a lift – well, it was for me! – and that's because the cabinet employs dual-layer construction, damping pads and bracing for conspicuously rigid and weighty construction.

### SOUND QUALITY

I kicked off using our PrimaLuna EVO300 Hybrid amplifier to drive the Mission's, expecting its powerful FET amplifier to control proceedings for beneficial purpose – but I was wrong. Dramatic definitely – but also very forward. It was when I tried to play Fleetwood Mac's *Go Your Own Way* (24/96) that the Pause button got hit. Mine is far from a good recording, supposedly 24/96 according to the track data but sounds like an early digital transcription for CD upsampled to 'hi-res'. Classic Rock like this has to be playable no matter what and I felt uneasy about

this track via the 770s.

Explaining why I hit Pause and swapped over to our silky-smooth, darker sounding Creek Voyage i20 amplifier. This softened the delivery into amenable balance where the multi-track 'chorus' was less forward.

Moral of the tale being the new 770 is clear, forward and fast, or "well lit" in alternative parlance. I've rarely heard Sinead O'Connor sounding so far out of the mix, so close to me, when singing *Foggy Dew* (CD). Got to clearly hear about the "Huns with their long range guns" here, but the Bodrans of the Chieftains had force that shook my lounge.

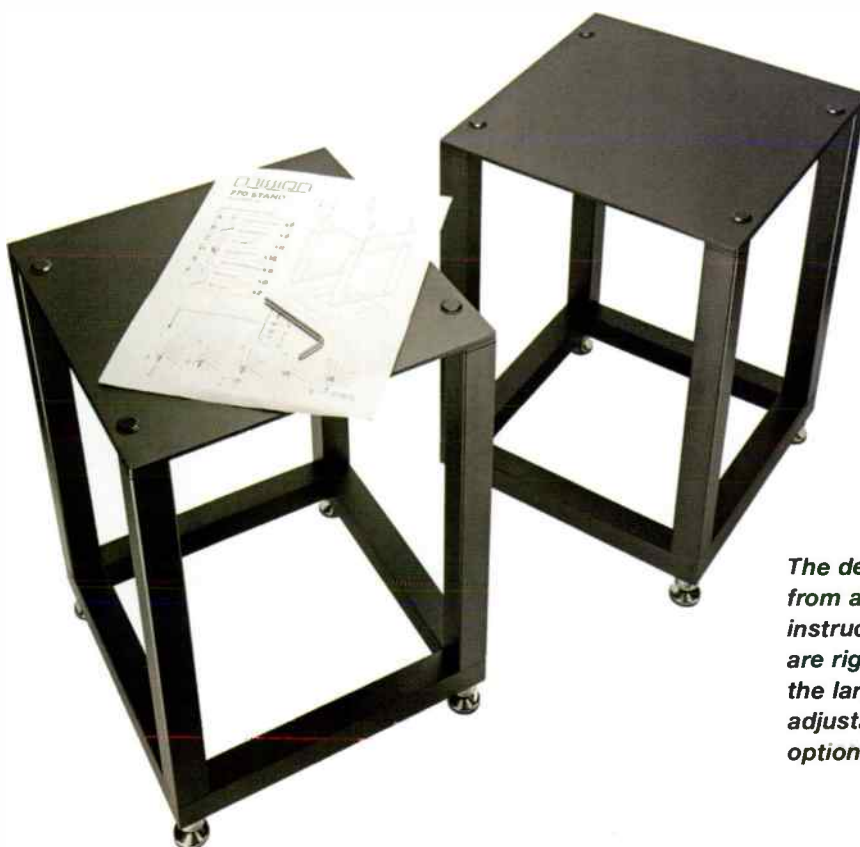
Likewise with Dadawa's *Canton Story* (CD), the massive drum strikes were wonderfully resolved, not only reproduced with laconic power but also with timbral insight. Here the 770s were a conspicuously modern, computer optimised big box loudspeaker out in front with technical ability. What they have is bass speed and insight, in addition to sheer power. The bass/midrange unit sends out a lot of information.

Back to Fleetwood Mac's *Go Your Own Way* – and with the Creek it was less sheeny, revealed as a not-too-clear recording, vocal harmonies a tad strident, as



**A simple veneered rear panel with one set of terminals for mono-wiring. The identical width / depth dimensions can be seen here, giving the cabinet a solid, square appearance.**

expected from an old recording. With *Dreams* from the same album (*Rumours*) this standard '70s Rock track was solid and fast, Mick Fleetwood's drum work



**The dedicated stands must be assembled from a flat pack, using a simple numbered instruction sequence – and a hex key. They are rigid and carry rubber top pads to steady the large cabinets. At bottom are height-adjustable floor cones for stability, plus optional protective floor pads.**



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and crashing cymbals kept in clean order, free from distorting emphases. That allowed me to relax whilst enjoying the speed and as well as the dynamic weight at low frequencies.

The choral sections in Handel's Peace of Utrecht (DSD) were crisp and clear, shining out, whilst harpsichord chimed in lucid fashion. The 770s shine a strong light, making for vivid revelation. They also set up a capacious sound stage, giving the Trondheim

artificial emphasis anywhere it manages to be forward, revealing and highly detailed: squeaky clean

yet correctly so. With powerful low bass and great bass resolution this is a loudspeaker worth hearing.



*The floor protectors come in a lavish presentation case complete with white handling gloves to ensure fingerprints don't spoil the aesthetic. They help keep paw prints off the loudspeakers as well.*

**Mission use a 8in polypropylene bass driver in the new 770, but it has been stiffened with a mineral additive to form a better behaved composite for clear, projective midband sound.**

Soloists a sense of scale behind Marianne Thorsen playing Mozart's Violin Concerto No3 (24/96). Her violin was crisply clear but smooth and detailed too. The sense of smoothness and cohesion in the sound was helped by treble that passed unnoticed: it was just part of the music rather than a disconnected entity.

Drawbacks? A small sense of the sound being box-bound existed, likely colouration from the front mounted port. as well as a rear wall reflection back out through the cone at 1200Hz. Curiously, this was barely noticeable with the Creek amplifier due to its enveloping quality, whilst the PrimaLuna – being cooler in delivery – made the effect more obvious.

**CONCLUSION**

The new Mission 770 brings total accuracy and smooth revelation to a loudspeaker that comes over as clean and powerful. Without

**MEASURED PERFORMANCE**

This new version of the 770 aims to keep close to the original in outline, improved to best current standards. There is no crossover dip between the two drive units our frequency response analysis shows, improving detail. The trace is relatively smooth across the entire audio band, the 28mm dome tweeter perfectly aligned with output from the 8in bass/midrange unit to avoid excessive treble.

In similar vein, bass runs smoothly down to 50Hz before rolling down slowly below this point, the port (red trace) adding to output at a low 30Hz, making deep bass possible.

The new 770 is very modern in having a near-flat response to deliver superb accuracy, without treble emphasis. Crossover frequency is quoted as 2.9kHz.

The port output trace shows some activity from internal modes around 630Hz and 1200Hz that may be audible from the front port. Identical cabinet width and depth don't help here, nor x2 height.

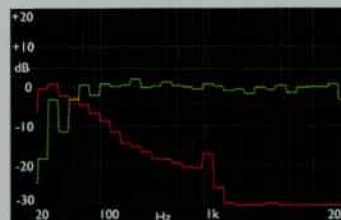
Unusually, perhaps to mimic the original, the new 770 has an 8 Ohm bass/midrange unit, this value forming the d.c.r. minimum reached in the impedance trace. Overall impedance, taking into account reactive peaks,

measured 9 Ohms with pink noise – a very high value. This lessens current draw and usually compromises sensitivity, but at 87dB from one nominal Watt (2.8V) of input it is still sufficiently high for amplifiers of 40W or more to suit. NK

The new 770 is a smoothly accurate, broadband loudspeaker that reaches low. It meets highest modern standards. NK

**FREQUENCY RESPONSE**

Green - driver output  
Red - port output



**IMPEDANCE**



0744671 0391

**MISSION 770**  
**£3500**



**OUTSTANDING - amongst the best.**

**VERDICT**

Crisply clean and detailed, with great bass – but an easy listen.

**FOR**

- high accuracy
- crisp and clear
- deep, powerful bass

**AGAINST**

- visually intrusive
- slightly box-bound

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"The PG-1 is a two speed (33, 45rpm) belt drive design that, judging by its arm, comes from Pro-ject of Austria. Pro-ject are adept at fitting extra bits into turntables, such as phono stages and digital outputs, to make them more adaptable – and that's what you get here. The PG-1 has a simple internal phono stage (MM only) so will feed any amplifier direct, but it can be switched out if

an external stage or amplifier with its own phono input is used.

Unusually, there's a digital output in the form of Bluetooth wireless transmission, but only Bluetooth and nothing else – there's no S/PDIF digital output in optical or electrical form. The Bluetooth stream is 16bit / 44.1kHz – CD quality.

The PG-1 has no auto mechanisms. I used either the damped cue platform and lever, or the headshell finger lift. I prefer to use my fingers and here the simple, flat headshell grip was difficult to grasp – as they always are. Headshell finger lifts need to be curved upward but – hey-ho – this is a minor point since most people will likely use the damped platform and

it worked smoothly. Also, the finger lift can be replaced for a better one if you hand cue like me.

Bouncing cartridge onto LP always was a big problem with vinyl, resulting in bent cantilever and the cost of a replacement stylus. Audio Technica have a good remedy in their AT-3600 MM cartridge; it has a carbon composite cantilever able to withstand such heavy use – and that is what Blue Aura fit to the PG-1. It tracks at 3.5gm but the use of carbon fibre in the cantilever gives it a wonderfully smooth and deep sound that is entirely in-character with LP – and preferable I feel to the brighter sound of metal cantilevers, which most are".

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## QUESTIONS

**[1] PG1 drive is by –**

- [a] chain
- [b] belt
- [c] shaft
- [d] bubble gum

**[2] Phono stage is –**

- [a] ceramic
- [b] MC
- [c] optical
- [d] MM

**[3] The AT-3600 cantilever is –**

- [a] aluminium
- [b] steel
- [c] carbon composite
- [d] bamboo

**[4] Bluetooth stream is –**

- [a] MP3
- [b] Ogg Vorbis
- [c] 24bit
- [d] CD quality

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# Exhilaration Rebellion!



**Martin Pipe listens to Cyrus's new top-of-the-range Pre-XR preamp, via a Stereo 200 power amp.**

**T**aking pride of place at the helm of Cyrus's lineup is the new 'XR' series of "discrete audiophile components". XR builds on the success of the Huntingdon-based firm's 'Classic'

midrange proposition, but continues the distinctive half-width styling that instantly identifies a Cyrus product. Currently, the XR range consists of two integrated amps, a 'reference' CD transport, a preamp/DAC and an upgraded

version of the familiar PSX power supply. In this review, we'll be looking at the 'Room tested' preamp/DAC (the £4,195 Pre-XR) with an existing Classic Series power amp (the £2,200 Stereo 200), here finished in a sophisticated matt

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*Inside the Pre-XR. The QXR DAC module is clearly visible to the right of the picture. Underneath it, on the motherboard, are the phono stage, volume control and input-switching relays. Cyrus has specified a linear power supply, as evidenced by the toroidal mains transformer.*

black. The former can be upgraded with the aforementioned PSU-XR power supply, when it's launched in November.

XR has its roots in the QXR dealer-fit DAC module upgrade, a 2019 introduction for existing products like the 8-series integrated amps, as well as higher-end Cyrus DACs and preamps produced over the past decade or so. Based around the now-familiar ESS9038Q2M Sabre32 Reference DAC chip, the QXR DAC is fitted 'as standard' to the Pre-XR. Since it's pluggable, the board - which offers four conventional digital inputs (two coaxial, two optical) and a PC-compatible USB port - could presumably itself be replaced by new models built around as-

yet uninvited technology. Such futureproofing is praiseworthy, as it ensures that features and format support can be added without having to ditch the rest of the not-inexpensive unit.

As far as the Pre-XR is concerned, that equates to a full-featured digitally-controlled analogue preamp with four relay-switched line inputs - no balanced XLRs here, presumably due to lack of rear-panel real-estate - and a basic but well-engineered MM-only phono stage (with earth binding post). Also around the somewhat busy backside are the 3.5mm headphone socket (what was Cyrus thinking?) and the main outputs - unbalanced (phono) and balanced (XLR) for the power amp,

plus a second 'fixed' set of phono outputs that allows the Pre-XR to be used as a comprehensive DAC with other systems or to feed an amp in another room. It can also be used for recording, but Cyrus hasn't also specified a genuine tape loop. What it has built in is a high-quality linear power supply based around a toroidal transformer, but with the option - courtesy of a 15-pin D socket - to power it from the forthcoming PSU-XR.

Also reliant on a linear power supply is the Stereo 200 power amp, a design which is claimed to offer a beefy (or, as Cyrus puts it, 'Herculean') 203W RMS per channel, into 6 ohms. That traditional power supply technology is unusually partnered



*An exceptionally-busy rear - yet Cyrus has managed to find space for a headphone socket, which should really be on the front panel! Note the phono stage's shorting plugs, which should be kept in position until you 'go vinyl', and the 15-pin connector for the optional PSU-XR power supply.*



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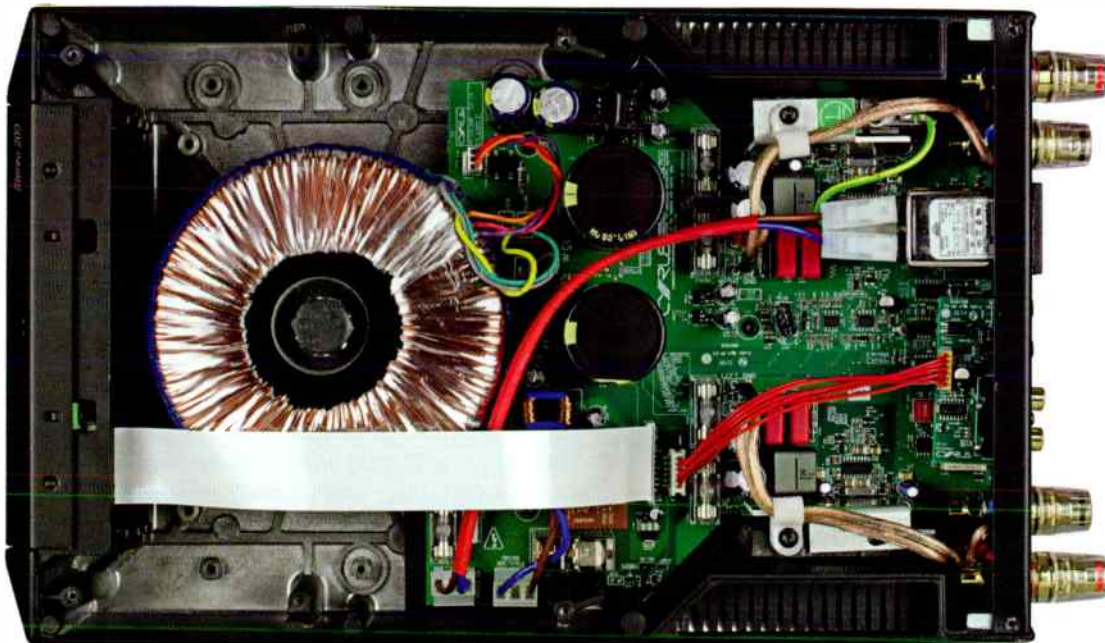
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**KEF** 60  
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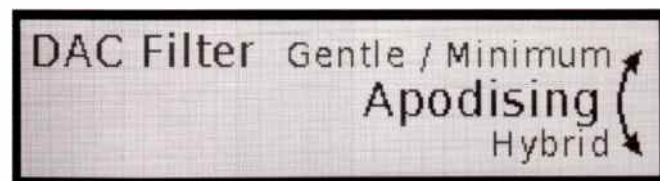
**Inside the Stereo 200 - an unusual hybrid of traditional power-supply technology (note how large the toroidal mains transformer is, compared to the less-hungry Pre-XR's!) and potent Class D amplification**

to amplification employing Class D 'switching' techniques, which Cyrus has to date only used in its Lyric all-in-one systems. Efficiency is one of Class D's benefits, and despite its small size the Stereo 200 - which can be fed via balanced

buttons positioned beneath a clear LCD screen. To avoid accidental operation, you have to deliberately hold down the standby button to wake the unit from its slumbers! The Pre-XR's volume knob is coupled to a digital rotary-encoder,

example, trim the levels (volume offset) of each analogue input to avoid jumps when switching between them. The maximum volume levels of the headphone amp - which is driven by a purpose-designed TI 'DirectPath' chip - and line output can also be independently-set for each input! Muting is also the responsibility of this chip. Since the two channels of the PGA2311U can be independently-adjusted, Cyrus has also been able to implement a stereo balance control without the need for additional circuitry.

Another chip-related benefit is the ESS9038Q2M's range of digital filters, which tweak the DAC's sound according to user preference and source material. No fewer than seven options that aren't explained in the manual - including minimum-phase and linear-phase filters with steep or gentle roll-offs plus brickwall,



**The Pre-XR's ESS9038Q2M Sabre32 Reference DAC chip can accommodate seven FIR (finite impulse response) filters, of which this is one.**

or unbalanced inputs - never ran uncomfortably hot, even during long listening sessions. Part of the reason for this is Cyrus's expensive die-cast aluminium enclosure (as also specified for the Pre-XR), which acts as a heatsink as well as providing anti-resonance benefits. Yet for all this it only weighs 6.9kg.

Most of the tech-driven sophistication lies within the Pre-XR, although the Infra-red handset that accompanies it would have been a more suitable partner for a Philips telly circa 2002. This large slab of a device will however control other Cyrus kit, including CD players and streamers, and there's a 'learning' function too. Front-panel control is of course also possible, courtesy of a row of dedicated

instead of an analogue pot. Control over volume is accomplished using a Texas Instruments PGA2311U chip, which works in the analogue domain.

Cyrus has cleverly exploited the potential of this device - which, unlike a conventional pot won't wear out and go crackly thereby putting your tweeters at risk if you're using a powerhouse like the Stereo 200. You can, for



**A sensibly-designed user interface, which takes advantage of a readable LCD panel. From here, you can configure inputs, volume levels and standby button/headphone behaviour amongst other things. The display also indicates sampling rate when the Pre-XR is in DAC mode.**



*The Stereo 200 can be fed via balanced (XLR) or unbalanced (phono) inputs, the latter benefiting from 'chain' outputs for bi-amping. MC-Bus socketry (Cyrus) and a 12-volt trigger (for third-party gear) are provided for automatic standby switching; there's also an automatic 'music sensing' option.*

apodising and 'hybrid' options - are provided. The ESS9038Q2M, alongside Cyrus's support circuitry, can natively-handle DSD content (up to DSD512) and PCM content all the way to 32-bit/768kHz. That's with the USB interface, provided by an XMOS U30870C10 device; using the optical and coaxial digital outputs, you're restricted to 24/192. The selected source's sampling rate is displayed on the LCD when the Pre-XR is operating in DAC mode.

The Pre-XR can, like many high-quality preamps, be integrated into an AV system - here, one of the line inputs is defined as 'AV' in the menus. Doing so fixes its output at a specified level, the connected AV processor instead performing volume-control duties. In such installations, the Cyrus kit would reproduce the front left and right channels of surround-sound material. The inputs can be renamed, to reflect your personal preferences and installation.

Not quite so flexible is the MM-only phono stage. No control over input loading is offered, and no switchable 'warp filter' either. If such facilities are essential, you'll need an offboard phono stage (such as Cyrus's own Signature, which can be controlled by the supplied remote).

To avoid faffing around the back, Cyrus suggests that headphones can be connected permanently - you can switch between these and the line output, using a front-panel 'phones' button. However, the Pre-XR is also capable of automatically-switching the output to headphones whenever they're plugged in.

Irrespective of the chosen method, you'll need a 6.3mm adaptor (or lead) for most quality headphones. As regards speaker listening, the manual explains how the Pre-XR can be connected for bi-wiring or bi-amping with one or more power amps. Talking of which, the Stereo 200 features 'chain' outputs for feeding additional amps. Its robust speaker terminals will accept bare wire, spades or 4mm banana plugs.

## PERFORMANCE

I used the Pre-XR/Stereo 200 combo with a variety of sources, including a Windows PC, Humax digital set-top box, Cambridge CXN streamer, Hitachi FT5500 Mk 2 tuner, Ariston RD80 SL/Linn Basik/AT-440MLb vinyl front-end and Pro-Ject CD transport. My speakers were Quadral Aurum Wotan VIII floorstanders. I ran into an incompatibility issue with the USB driver - it's the first I've come across not to support the admittedly-obsolete Windows 7. This may concern anyone giving their older PC a new lease of life as a music playout device, a task that doesn't after all require the latest and fanciest hardware. When I tried to install the software, I got a "setup cannot run on the current operating system" error. According to the XMOS website, the "Production (Thesycon Driver)" - basically, what's downloaded from the Cyrus site - should work under Windows 7.

In key musical respects, though, the system worked exceptionally well. The first thing I noticed is how gutsy the presentation is, but not at the expense of finesse. The impact of the bass drum that

kicks off Ring-a-Ring o' Roses, from Charlotte Gainsbourg's Rest (24/48) was visceral in its impact, yet Gainsbourg's breathy vocals retained their intimacy. Bass guitar on tracks like The Changingman and Whirlpool End, from Paul Weller's Stanley Road (CD), were likewise given the depth and scale



*The Cyrus remote, which looks like something you'd get with an early-2000s TV set, will operate Cyrus source components. However, it also boasts a 'learning' function that can replace two other handsets.*

they needed without any tendency to sound overblown - something that may seem impressive on first encounter, but will ultimately lead to listening fatigue.

A very different recording - Walton's Crown Imperial (English Northern Philharmonia/Paul Daniel, Naxos, CD) demonstrated the system's effortlessness at communicating details - even during orchestral climaxes, the



energetic cymbal clashes retained their clarity. Another Naxos CD – Holst's Somerset Rhapsody (Royal Scottish National Orchestra/David Lloyd-Jones) had me appreciating the rasping intricacy of the oboe, and the different subtleties of the string tones.

Next up was a 24/96 high-res file, originally captured on minimalist analogue equipment. Tone-Pearls' Hungarian Songs in a Chateau consists of works by Béla Bartók, Ernő Dohnányi and György Ligeti, played by Anne Sophie Petit (coloratura soprano) and Marcell Vigh (piano). Through my speakers, I found the tiniest details, such as the natural decay of the piano and a sense of the room's acoustics, to be highly-convincing. As ever, the digital filters made only incredibly subtle changes to the presentation. Personally, I developed a slight preference for

the 'hybrid' option.

Moving to the phono stage, it's certainly competent with an open and broad sound; however, woofer cone-flap was noticed when spinning records that weren't particularly flat (and there's only so much good the RD80's clamp can do here!). Many of these positive attributes made it to Focal Utopia headphones, connected to the Pre-XR via the necessary 6.3mm adaptor.

It seemed that the Cyrus combo gives its best, in terms of transparency, when interconnected via phono leads. Decent phono cables are more widespread (and affordable) than the more complex XLR types.

**CONCLUSION**

Cyrus is using 'tried-and-tested' technologies - but in different and interesting ways. Class D amps are



*Don't use them for audio! These phono cables are instead intended to interconnect Cyrus components, courtesy of the 'MC Bus' daisy-chain, so that remote commands can be communicated between them.*

fairly commonplace nowadays it's rare to find one hitched to an 'old-school' linear power supply. The latter decision has evidently paid off, the Stereo 200 being one of the most musical Class D amps I've come across. In my view Cyrus's decision to put the headphone socket (and a 3.5mm one at that!) on the Pre-XR's rear panel was not the best. But such matters apart this system worked well.

**MEASURED PERFORMANCE**

The Cyrus Stereo 200 amplifier produced 200 Watts into 8 Ohms, increasing substantially to 380 Watts into 4 Ohms, making it nominally a 250 Watt amplifier into 6 Ohms (the impedance of current loudspeakers). Cyrus quote a conservative 203 Watts.

Into a purely resistive load distortion at 1 Watt measured 0.01% at 1kHz and 0.02% at 10kHz, a good result. At near full output just 0.03% at 1kHz but a high 2% at 10kHz, due to Class D slewing.

Into an inductive load (1.3mH in series with 4 Ohms) at 1 Watt these figures rose slightly to 0.06% at 1kHz and 0.07% at 10kHz. At high output above 0.2V at 1kHz and 2% at 10kHz. Class Ds can be badly affected by loudspeaker inductance but the Stereo 200 was relatively good in this respect.

Frequency response peaked at 40kHz into an 8 Ohm resistive load and rolled down slightly into a 4 Ohm resistive load (after SID tuning), effectively giving flat response into 6 Ohms. However, in spite of SID load tuning the Class D is load sensitive, as most are. With an inductive 8 or 4 Ohm load (1mH) the peak rose to +8dB but in-band there was a slight roll-down likely to induce a warm-sn sound balance. SID made no difference. Output impedance was low at 0.09Ω giving a damping factor of 85.

The Pre-XR had x4 gain from Aux1 (AN1) input to XLR output, with a maximum output of 5.4V and input overload of 3.6V – satisfactory

if unexceptional figures. Frequency response measured flat from 3Hz to 80kHz.

The MM phono stage was accurately equalised but has no warp filter at all, so loudspeaker cone flap will occur with warped LPs. Gain was high x378mV (51dB) giving an effective input sensitivity of 4mV for full output from the power amplifier. Input overload was satisfactory at 36mV and noise low.

With digital 192kHz sample rate S/PDIF input via Dig 3 (electrical) input the response limit was 68kHz (-1dB) before a slow roll down to the 96kHz upper theoretical limit. The Dig 1 optical input had a 96kHz sample rate limit. The filters made little difference at any sample rate, including CD. USB gave identical results to S/PDIF. EIAJ Dynamic Range was low at 107dB with hi-res (24bit) where 117dB or more is expected.

In spite of SID tuning the Stereo 200 was load sensitive but very powerful and clean at low levels. Digital dynamic range in the preamplifier was disappointingly low by current standards. **NK**

**POWER AMPLIFIER**

Power (6Ω)	250W
Frequency response	4Hz-48kHz
Distortion (10kHz, 1W, 4Ω)	0.02%
Noise (IEC A)	-98dB
Sensitivity	1.5V

**PREAMPLIFIER LINE**

Frequency response	3Hz-100kHz
--------------------	------------

Distortion (-60dB, 24bit)	0.001%
Gain	x4
Overload	3.6V in / 5.4V out

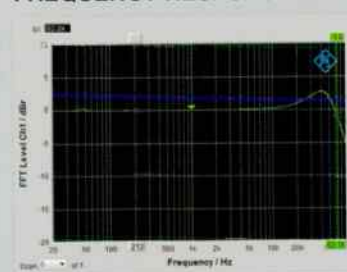
**PHONO**

Frequency response	40Hz-20kHz
Distortion (-60dB, 24bit)	0.12%
Sensitivity	4mV
Overload	36mV

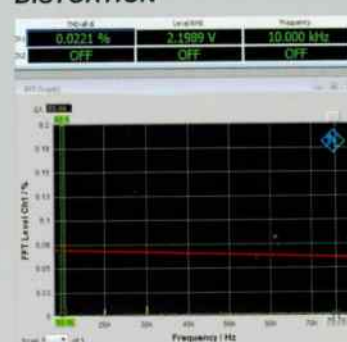
**DIGITAL**

Frequency response	4Hz-68kHz
Distortion (-60dB, 24bit)	0.04%

**FREQUENCY RESPONSE**



**DISTORTION**



**CYRUS PRE-XR**  
£4,195

**CYRUS STEREO 200** £2,200



**EXCELLENT - extremely capable.**

**VERDICT**

The Pre-XR/Stereo 200 is a good-sounding combo that matches visually, despite being from different ranges. It proves that Cyrus still has what it takes to compete in higher-end audio circles.

**FOR**

- awesome scale, but with finesse
- numerous inputs
- on the whole, a well thought-out design

**AGAINST**

- rear-panel headphone socket
- USB Windows compatibility issues
- inadequate coverage of USB audio setup in the manual

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There was an inviting smoothness and this had a lulling effect. I did however quickly sense there was little upper treble, helping explain this smoothness, one that approached warmth. The strings of Nils Lofgren's guitar in Keith Don't Go (CD) lacked their usual bite, coming over as easy and clean, mild mannered instead of lacerative.

Austrian Audio have kept bass in even balance: these are not bass heavy 'phones, rather they are accurate if a tad soft in impact, the big, synth kick-drum beat and individual drum strikes in Safri Duo's Samb Adagio having weight and power, if slightly soft demeanour. But they blended in



**The Hi-X50s fold neatly flat for compact storage – useful on the move. The upper headband has soft cushions for comfort, much like the cushions around the earpieces. Altogether a well finished headphone.**



**Our review sample came with this single 300cm (10ft) long stereo cable for the home, unsuitable for mobile use where 100cm is commonly supplied. The terminating 3.5mm stereo jack plug comes with a 1/4in (6.3mm) adaptor.**

well with the overall sense of softness and warmth in the sound.

With classical vocals the closed-in presentation was readily apparent, Johannette Zomer singing Lascia Chi'io Pianga (DSD) inside a small room it seemed, so not much affinity here. Yet with Brahms Piano Concerto No3 (DSD) the piano of Dejan Lazic was sweetly clear and the Atlanta Symphony orchestra stretched wide. The 'phones were gently clear and uncoloured here, making for an enjoyable listen. I borrowed a pair of Audio Technica ATH M50x headphones of similar price

and they were more open but had quite sharp treble in comparison. Not even similar then – clearly highlighting the silky smooth nature of the Austrian Audios.

**CONCLUSION**

These are what I would term "civilised" headphones. They are smooth and even in sound balance, sweetly clear across the mid-band and insightful. Bass level was perfectly judged but bass quality on the soft side. A typically closed-in sound has to be traded for compact form and low sound leakage. But the final outcome was lovely enough all the same.

**MEASURED PERFORMANCE**

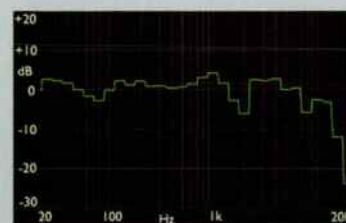
Our frequency response analysis published here shows basic output pressure response, without HRTF correction. Austrian Audio insert only a small HRTF dip around 2kHz (it's usually 3kHz), effectively raising the upper midband to strengthen detail. There is well aligned treble extension to 7kHz before a slow roll off above this frequency, suggesting reticent upper treble – possibly some warmth but no hiss or spit. Bass is smooth and extended, helped by the soft ear pads providing a good seal to the head.

The impedance trace shows a value of 30Ω with a voice coil d.c.r. of 27Ω. Injecting 1mW (173mV/ 30Ω) sine, sound pressure level measured 93dB – very loud from just 0.17V so no problem in real life where mobile 'phones and portable players produce 1V-2V or more.

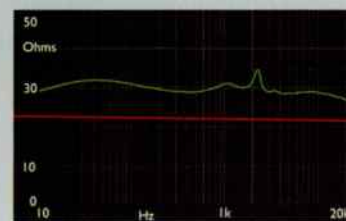
The Hi-X50s provide even output across the audio band, with a shallow

HRTF dip. This will heighten upper mid-band detail. Bass was smooth and extended, but treble rolls off above 7kHz; there is little upper treble, suggesting a sound with some warmth. NK

**FREQUENCY RESPONSE**



**IMPEDANCE**



**AUSTRIAN AUDIO HI-X50 £299**



**EXCELLENT - extremely capable.**

**VALUE - keenly priced**

**VERDICT**  
Soft sound, comfortable, light weight. A bit restrained though.

**FOR**  
- light weight  
- compact  
- easy sound

**AGAINST**  
- lack sparkle  
- enclosed sound  
- no balanced option

www.austrian.audio



# Mail

## LETTER OF THE MONTH PRIZE

Answers by: NK - Noel Keywood; PR - Paul Rigby;  
MP - Martin Pipe; JP - John Pickford.

**Visit our website at:**  
[www.hi-fiworld.co.uk](http://www.hi-fiworld.co.uk) or send your  
emails to [letters@hi-fiworld.co.uk](mailto:letters@hi-fiworld.co.uk).

**Letter of the month wins a superb  
Blackline PG1 turntable!**



### BLUE AURA BLACKLINE PG1 TURNTABLE

<https://www.blueaura.co.uk/product/pg1-turntable/>

**A BLUE AURA BLACKLINE PG1 TURNTABLE is on it's way to  
JAMES ATKINSON, Letter of the Month winner in our July 2022 issue.**

## Letter of the Month

### GOING FOR BRONZE

I am now the proud owner of an Ortofon Cadenza Bronze MC cartridge, courtesy of Guildford Audio.

The buying experience showed the criticality of having a good dealer that is willing to spend time and effort supporting you. My one big advice to all Audiophiles is, do not buy a cartridge online or without listening in your record player.

Anyway, Trevor and his team turned up at my home with a selection of cartridges, then spent 3+ hours ensuring that they were correctly set up and then listening to various albums with me as part of the selection process.

We started with the Cadenza, feeding into my valve EAR834 phono stage. It sounded very good from the get-go, certainly an improvement on my rather tired sounding Ortofon Quintet Black.

Next up was the DS Audio DS-E1 – and this showed the importance of listening. It was an obvious mis-match with my VPI turntable, sounding flat and boring: something was fundamentally wrong with the sound. We were all surprised. Much head-scratching and checking, but no, VPI



**John Speight's VPI Prime turntable with JMW Uni-pivot arm. "Not a happy marriage" with DS Audio DS-E1 optical cartridge, he says. Fitted here with an Ortofon Cadenza Bronze.**

Prime with JMW Uni pivot and DS Audio is not a happy marriage.

What impressed me though was the care that the guys took in setting up. They ensured the cartridges were correctly installed, that the VTA was OK, bias OK, downforce perfect and that the arm was 100% flat (not easy with a wobbly uni pivot).

Here is a team used to installing systems costing 10s, 100s of thousands of pounds yet here they were, having travelled over 50 miles to spend time helping me set up and choose a new cartridge. Thank you Trevor and looking forward to trying out the IsoAcoustic Gaia isolation feet

on the Martin Logans.

**John Speight**

Hi John. Thanks for your experiences – and uplifting to hear how much effort and time Guildford Audio were prepared to put into letting you hear cartridges at home, installing them for you to eliminate making the big mistake that totals the cantilever.

You didn't give us your views of the sound of the Bronze, which I and others would like to have heard. Especially since you have the extraordinary Martin Logan Classic ESL-9 hybrid electrostatic



**Ortofon Cadenza Bronze MC cartridge – an affordable beauty.**

loudspeakers that reveal all.

Did you discuss hearing Ortofon's diamond cantilever Verismo? At £5350 perhaps more

expensive than you might wish for, but dramatic in its sound. However, the Bronze at £1800 is the best value MC available in my experience. **NK**

#### DENON & GARRARD

Thanks for printing Paul Topping's letter about the fate of his Denon DL304 cartridge.

When Paul heard the mistracking on the Expert repaired Denon I wonder if he got in touch with Expert Pickups? Repairs usually carry some sort of warranty, although the mistracking may have occurred outside of any such warranty. Expert would have been my first port of call concerning the mistracking, having had the cartridge repaired by them.

I was pleased to hear that Paul is now using a Garrard 401. As I've said in HFW, I have had my 401 for around 50 or so years now. Like Noel's 401, it was serviced by Martin Bastin.

#### Regards

**Mike Bickley**

PS The Garrard 401 in the July edition is in a Lorrircraft plinth not a Martin Bastin plinth.



**Garrard 401 on plinth from Martin Bastin – the 401 expert who came before all others.**



**EAR 834P valve phono stage with MC step-up transformers – for a spacious sound that Ortofon recommend.**



**DS Audio DS-E1 optical cartridge that comes with special pre-amplifier with power and equalisation unique to the cartridge.**

Hi Mike. Yes, we put in a Garrard 401 picture different to our much published Martin Bastin mounted version, for the sake of variety. But perhaps this wasn't wise. Happily, digital pictures don't fade or degrade (digital's good for some things!) so here is my original Martin Bastin mounted 401 from around 1993 and still working fine, like yours. The turntable itself I bought from Garrard whilst it was current, back in the early 1970s; it rumbled even in a big, solid plinth so went into the departure lounge (loft). Martin Bastin fixed it for me in 1993, with his superb plinth and possibly a new idler wheel – quite what magic he worked he never told me. I still tend to think of him as a magician.

Fascinating that nowadays this major classic can be restored by experts around the world. Anyone interested might like to check out Peak Hi-Fi, Sheffield (UK) who have superb knowledge about the Garrards and can supply all necessary parts, upgrades etc.

When you get 50 years from a product that sounds uniquely superb and gains in price too, it has to be good! **NK**

#### LIST THE KIT!

As a long term reader and subscriber I really enjoy your publication and



especially the views of Noel and other contributors both within reviews and also the monthly opinion pieces.

A couple of suggestions come to mind: is it possible that every effort can be made for reviewers to include at least some of the other equipment used, in order to give an overall context to comments and budget. Noel usually does this but on occasions others (perhaps through lack of space?) omit this valuable addition to reviews.

Also, there have been some changes to contributors and columnists and whilst some long standing reviewers are very well known, others – at least for me – are relatively unknown. Having a little about their background would add considerably to the understanding, depth and enjoyment of their comments and opinions: have they come from retail, design, repair, new to the industry, etc.

Many thanks for continuing to publish a meaningful magazine that both enlarges knowledge and is also enjoyable and fun to read.

**Mark Eley**

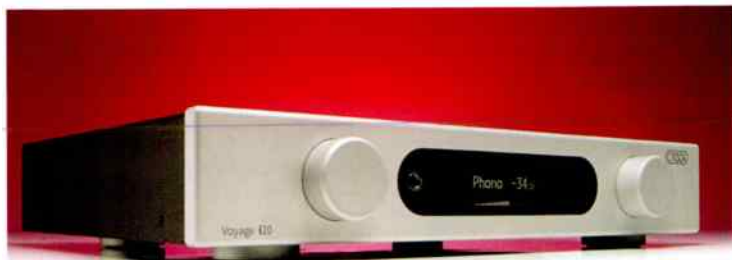
Hi Mark. Listing review equipment is a common request, which is why I always include such info, and for the most part so do our esteemed contributors. There are times however when such listings do become obstructive to the review's flow and there is not room for a box-out.

We do publish a resume once and, for example, John Pickford explained his interesting background recently in a column. But repeating such info clutters the page, getting in the way of subject matter. **NK**

**BLUETOOTH – AGAIN!**

Thank you for publishing my letter in HFW July 2022 [p28]. I'm still using the Quadral speakers you sent me a few years ago for a Letter of the Month! If I add a turntable to the system I may fall down the vinyl rabbit hole I managed to escape from 20 years ago, which may prove expensive.

I'm in danger of getting well out of my [technical] depth here, but I wonder if the dynamic range of a Bluetooth connection depends upon which codec is in use. The default SBC codec is limited to 16 bit resolution, but AAC should be capable of a higher dynamic range than 16 bit can deliver [ <http://www.tonestack.net/articles/digital-audio-compression/mp3-aac-dynamic-range.html> ].



**Creek Voyage i20 amplifier has an excellent Bluetooth receiver.**

In the review of the Cambridge Audio Evo 150 referenced you don't state which Bluetooth codec was used, but I am guessing that an iPhone running Onkyo HF Player would use AAC if supported by the receiving device.

The newer Bluetooth codecs such as AptX HD and LDAC should theoretically offer better quality, though are unsupported by iOS devices and their actual sonic benefits may be limited. I have read mixed reports.

For me, the biggest problem with Bluetooth listening in the iOS universe is that iOS doesn't display which codec is in use, and many receiving devices don't either. Some of the Sony DAPs do show which codec is in use; I don't know anything about the functionality of Android devices.

Even devices that can support newer codecs may only do so if specifically set up first. For example, I have an older pair of Sony headphones that can support Apt X and AAC, but will only do so if you go through a button pushing exercise after switching them on.

I completely agree with your final point about using good quality files to start with on an iPhone. Because of the way iOS works, if you play a lossy file over Bluetooth, it is decoded into PCM, re encoded into AAC / SBC for Bluetooth transmission, and then decoded again at the receiving device.

Two lossy encode / decode cycles won't do anything for sound quality. Because the files take up so much space, though, I only occasionally put DSD files ripped from SACD on my iPhone, and then only for playback over USB. Onkyo HF Player helpfully indicates when DSD is being sent to a DAC without being converted to PCM.

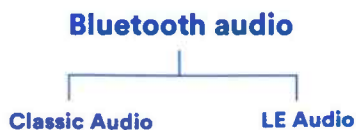
Thank you once again for an entertaining and informative magazine.

**James Atkinson.**

Hi James. Quite what is happening in an iPhone using iOS is, as you say, a mystery. Like MacOS, iOS core audio is PCM only but supports 24/48. With 24bit resolution it is able to provide very high dynamic range. And this is the critical part.

The only way to assess this is through the measurement of dynamic range. The de-facto way of doing this is by using a -60dB tone and measuring the quantisation noise and harmonic distortion it generates, as well as any random noise from other sources. It is a difficult measurement to make, requiring a sophisticated audio analyser, but our Rohde&Schwarz UPV puts lossy MP3 in the 93dB region, CD in the 100dB region and hi-res typically in the 110dB+ region.

Bluetooth was measuring 97dB or so which is pretty good. However, recently – with Bluetooth



**Classic Audio and LE Audio**

As the names suggest, Classic Audio operates on the Bluetooth Classic radio while LE Audio operates on the Bluetooth Low Energy radio. LE Audio will not only support development of the same audio products and use cases as Classic Audio, it will introduce exciting new features that promise to improve their performance as well as enable the creation of new products and use cases.

**LC3 Codec**

LE Audio will include a new high-quality, low-power audio codec, the Low Complexity Communications Codec (LC3). Providing high quality even at low data rates, LC3 will bring tremendous flexibility to developers, allowing them to make better design tradeoffs between key product attributes such as audio quality and power consumption.

**The new Bluetooth LC3 codec replaces that used in Classic Audio they say, offering up to 24bit resolution, at lower power consumption.**

5 – I have been seeing figures up to 115dB from an iPhone 11X Pro running 24bit PCM test files, suggesting the latest Bluetooth codec, claiming to provide 24bit resolution, is operative. The Bluetooth website talks about a new codec called LC3 (Low Complexity Communications Codec), introduced in 2020, that "supports 24 and 32bit depths" at up to 48kHz sample rate. How AAC fits into this picture I do not know, but it is not imposing lossy compression.

There are now hi-fi products coming through equipped with Bluetooth 5 and able to resolve the dynamic range 24bit offers. And, with high quality source files, there is a smoothness and body to the sound that is detectably better than Bluetooth of yore.

Trouble is, at present, most music files are 16bit and they will not sound any better. Listen to good 24bit or DSD and you can detect an improvement. Bluetooth is usefully improving in the amount of data it can send, old tropes about it offering MP3 quality being incorrect.

Mobile 'phones are now able to deliver very high sound quality and I've become a fan of using Onkyo's HF Player in conjunction with our Creek Voyage i20 amplifier when reviewing, connected by hi-res Bluetooth. **NK**

### LISTEN TO THE CAB

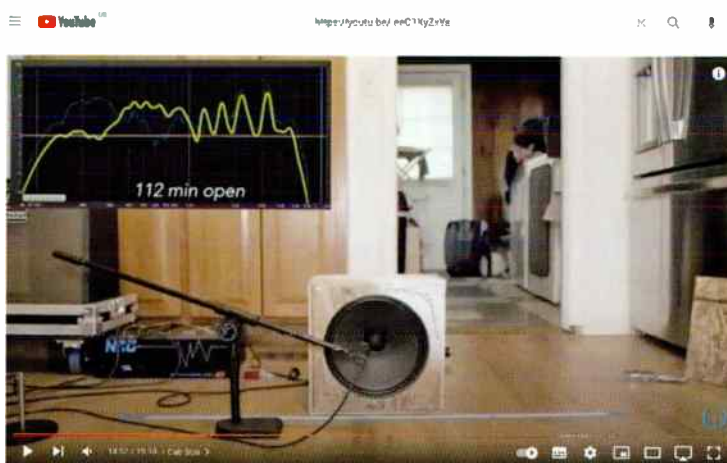
I was just watching this video on YouTube and thought this is exactly your kind of thing: <https://youtu.be/eeC1XyZxYs>. He discovers a lot of the things you talk about in Hi-Fi World but in a low-end kind of way about how speakers and cabinets effect sound.

Regards

**Dan Grundy**

Hi Dan. Thanks for the interesting link. Yes, you are right – we have done a lot of cabinet work like this in the past, producing World Audio Design loudspeakers. However, the basic work of matching drive unit to cabinet is a worked-out business involving Thiele-Small parameters. Feed these into a computer design programme (as we did) and you get to see computed behaviour of driver in any particular box volume, as well as port behaviour. It would have saved Jim Lill a lot of time.

He does mention internal box



Tested: Where Does The Tone Come From In A Speaker Cab?

**A YouTube video on loudspeaker cabinet testing. "He discovers a lot of the things you talk about in Hi-Fi World but in a low-end kind of way" says Dan Grundy.**

resonances, but is unaware – like many pro loudspeaker designers – that such resonances exit via the cone. This makes for a boxy sound, contributing heavily to what he hears as a cabinet's "tone".

The video was fascinating however – what a lot of work! – and Room Equalisation Wizard (free) is a great measurement programme for anyone wanting to get into all this, as he does. A nice vid. **NK**

### TRANSMISSION LINE KITS

Given the rise in the cost of quality hi-fi at a time of general inflation perhaps now is the time to consider reviewing some kit speakers? It is many years since I built speakers using Wilmslow Audio kits but I noticed recently that they are still alive and kicking and also producing transmission line speaker kits. Given the complexity of transmission line speaker cabinets, selling as a kit seems a good way of achieving value for money. However Wilmslow Audio also sell kits with ready made cabinets.

The problem for buyers is: how does a kit compare to an off-the-shelf speaker? It is difficult to hear a kit speaker and so hard to decide if they are good value for money compared to established makers. I know you do not cover comparison reviews but perhaps you would consider building a pair of transmission line speakers from a kit and then subject them to one of your full technical reviews?

This seems a good place to start: <https://wilmslowaudio.co.uk/transmission-line-loudspeaker-systems> Best wishes,

**Mike Tartaglia Kershaw**

Hi Mike. Wilmslow Audio have a long history – 50 years they say. And – also as they say – the cabinet is the most expensive part of a loudspeaker.

Their big transmission lines with Volt drivers are impressive if expensive when a flat pack cabinet is included, but I know from experience this is a lot of work. Their TL3, pictured here, looks to be good value at £900 with flat pack cabinet. We will certainly attempt to review such loudspeakers. Falcon Acoustics offer an IMF 200 transmission line kit also. **NK**

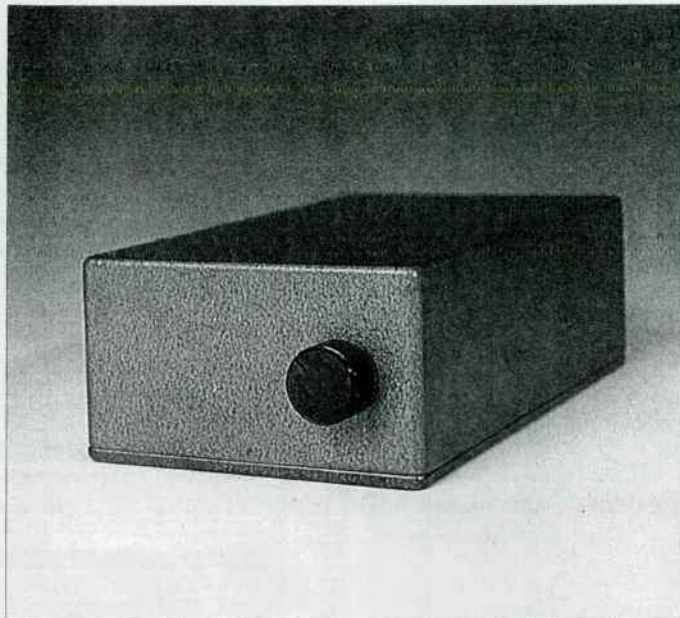


**Wilmslow Audio TL3 loudspeaker kit, available with or without flat-pack cabinets. Build them from a kit and test them, suggests Mike Tartaglia Kershaw.**

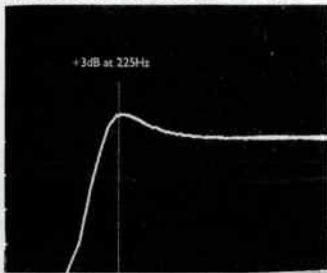
### CELESTION SL6000

In your reply to my letter in HFW January 2022 edition, you mention the NK design for a modified controller for the Celestion 6000, for use with Quad electrostatic speakers. My electrostatics are the Audiostatics DC1 by Ben Peters, refurbished for me by Solosound in Holland. The Audiostatics are full range, tall and narrow, and work well in combination with the





#### QUAD HIGH PASS SECTION



Most filters these days are, knocked up around a silicon chip. It's a fast and easy way of doing things, but not necessarily a satisfactory one. Cheap chips invariably have a sonic signature, something I wanted to avoid in the critical high pass section feeding the Quad. There are innumerable ways of designing such a circuit, but my notional ideal was to use just one high quality amplifying device.

I found that a remarkably high transconductance MOSFET, the VN10KM, offered what I wanted. This thing is a bit of a wonder for audio work, even if it is a pig to use, being almost 'naturally' unstable because of the gain available; a grid stopper must always be used if it is not to oscillate.

In the configuration used here as an active filter, the circuit has an overall gain of one, minimal noise, a very high

overload ceiling and negligible distortion at all frequencies and levels. It also has a high input impedance and a reasonably low output impedance, able to drive down to a  $4k7\Omega$  load with  $1000pF$  in parallel. I measured a  $124dB$  dynamic range. Quad enthusiasts can rest assured that this device is as transparent as one might hope, unlike chip-based filters.

Frequency response can be seen in our explanatory diagram and as an analysis from our spectrum analyser. A  $-12dB/octave$  high pass attenuation characteristic serves to prevent bass reaching the Quad, whilst the gentle lift that reaches  $+3dB$  maximum at  $225Hz$  equalises the Quad's natural roll-off, giving it a fuller, richer and more balanced sound.

#### CELESTION LOW PASS SECTION



Because of the amount of filtering involved here, and the fact that a high level of transparency is not required for heavy bass cones, I used a set of TL072/4 silicon chips for the low pass section.

The circuit is a pretty straightforward arrangement with a second-order high-pass at  $10Hz$ , followed by two cascaded second-order sections that combine to give equalisation and a fast, fourth-order, low-pass roll-off at  $150Hz$  that can be tweaked to yield that vital  $140Hz$  peak. Our diagram and spectrum analysis clearly show what this circuit provides.

Basically, an open baffle needs  $+6dB/octave$  bass lift to correct acoustic cancellation. However, room gain due to resonances, usually around the  $40Hz-70Hz$ , must be taken into account, or over-heavy bass results I found. This is a benefit, because low frequency gain can be lessened. It needs to be kept in check if power handling is to be acceptable, and that's why I also included a second-order high pass filter.

I'd suggest you don't get too involved in the filter electronics, as so many engineers do. It is not necessary to use Butterworth responses, for example, in the face of massive imperfections elsewhere. This whole speaker is in fact a struggle to understand and tame various acoustic phenomena of some magnitude; pedantic electronic details are a distraction.

The bass low pass section feeds a power amplifier that in turn drives the SL-6000 subwoofers (or equivalent). This needs to be able to deliver a good  $100watts$ . There are plenty of solid-state amps available second-hand for this purpose, or you could buy an NAD power amp new. They are very good value.

Remember that an open-baffle dipole subwoofer can produce enough bass to shake a building - but cones and power amps are put under severe strain if asked to do so.

In the next DIY Supplement we hope to have our own replacement for the SL6000s up and running, as well as a circuit board for active the crossover ●

Our thanks to Hi-Fi Experience Tel: 0171 580 3535, for the loan of Quad ESL-63s featured in the front cover photograph (ours don't look so smart without their grilles etc.)

HI-FI WORLD SUPPLEMENT

DECEMBER 1995

15

*Celestion subs. However I sometimes think that, compared with other systems I have heard, the mid-range is a little recessed. Wasn't that the same characteristic that Noel was wanting to correct with his redesign of the crossover?*

*An article in Stereophile by Martin Colloms makes a mild criticism of the crossover region in the*

*Celestion controller. The measurements in his article explain this quite clearly. The article is dated Feb 1987 and was republished in Feb 1996 and is still to be found on the internet.*

*You mention that Noel's design was published in a HFW DIY Supplement, but I missed it at the time. Is there a way of getting that design, or the Supplement itself?*

*Thank you for the recap of the principles of the dipole subs in January. Your advice has been invaluable all along.*

**James Ronaldson**

Hi James. Celestion's original correction network for their SL6000 open-baffle dipole subwoofer applied necessary  $+6dB$

octave gain below to 200Hz to compensate for such gain loss due to cancellation around the open baffle. This applied massive gain below 20Hz, causing overload with LP in particular. I designed a high pass filter to prevent this, as well as adding in some boost around 200Hz in an attempt to subjectively speed up the sound of the big paper cone that I believe was one of their high-power guitar drive units.

As I think you will already be aware, the SL6000 needs massive power in this arrangement, at least 200W but it cannot be pushed too far or will reach its mechanical limit.

You must rotate the cabinet on the floor to match it to the room, whereupon it will then 'magically' control its low frequency modes, something no other subwoofer can do. You get near perfect bass, right down to 5Hz with the HP filter switched out. This is a bit academic though: best to leave the filter in, to prevent the amplifier trying to deliver massive subsonic current into the cone's drive motor. We tried a number of power amps and they all sounded very different under such stress.

For readers wondering what all this is about, let me explain quickly. Celestion's SL6000 was an open di-pole subwoofer possessing two massive bass units on a frame; there was no cabinet and therefore no lower limit imposed by it. A di-pole bass matches di-pole (open panel) electrostatic loudspeakers.

A big issue however, one that Celestion only alluded to in theoretical outline, was room matching. We found it had to be

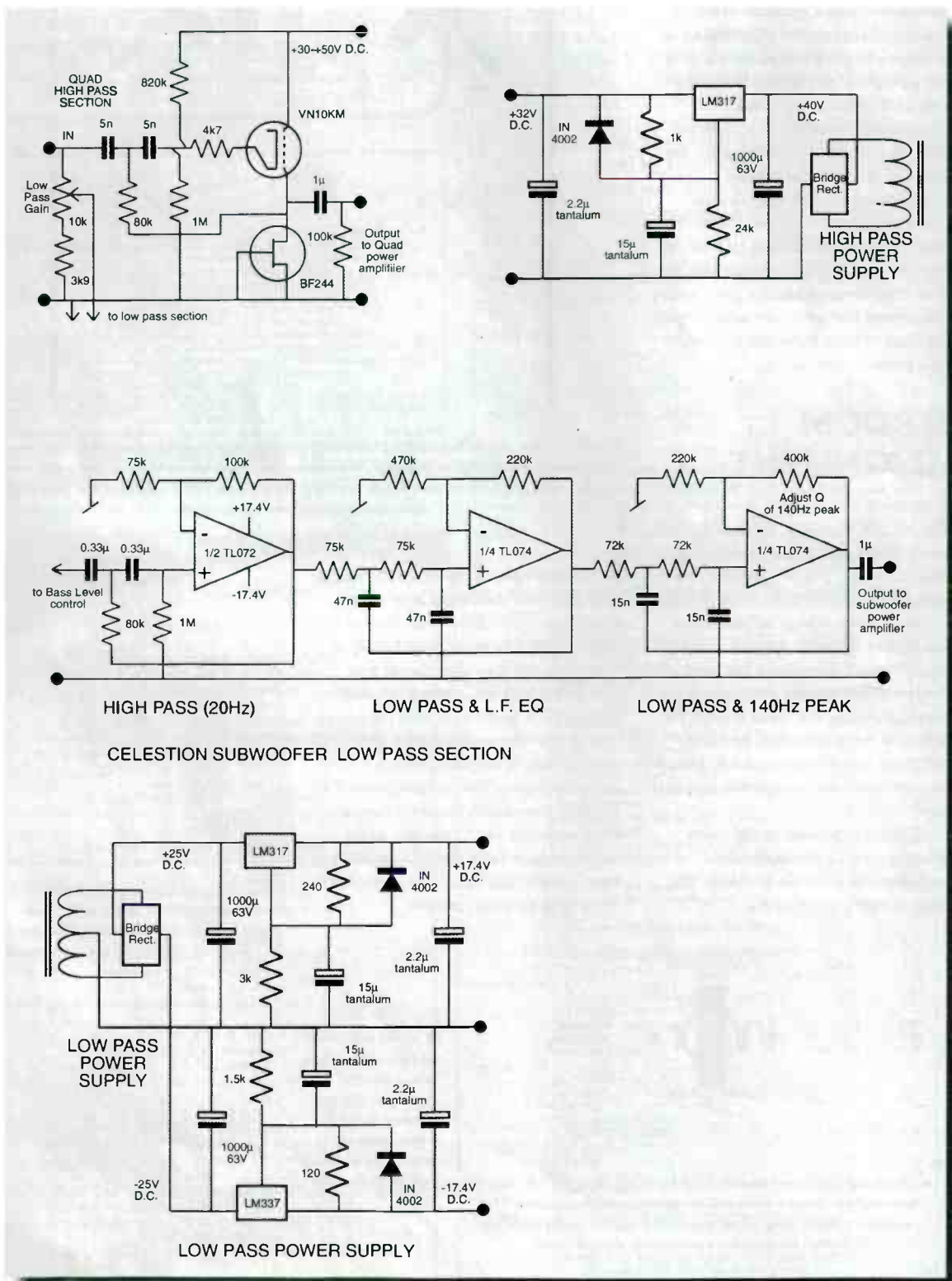
swivelled around to aim its side cancellation lobes (dead-zones) into corners, then bass was of unmatched quality. In effect it can be rotated to tune out (not drive) a room's modes, a property that makes it awkward to use but brilliant in sonic outcome.

This radical ability of a bass di-pole is little appreciated since it requires a 3D understanding of acoustical space and di-pole behaviour within that space. It's all

the other problems – mostly of power handling – that get talked about. Bit of a nightmare really, but an intriguing one.

I trust you have enough electrical knowledge to build this crossover and sort out any problems yourself. I suggest you use LTSpice (free) to analyse behaviour and tune, if necessary, to best suit your Audiostatics DCI.

I hope all this helps and is of interest. **NK**





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Sept 2021



Eisa 2021



Eisa 2021



Pick-IT Pro  
MM Cartridge



Carbon Fibre  
Coated Alu  
Tonearm



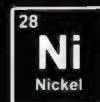
TPE Damped  
Platter



Full VTA and  
Azimuth  
adjustment



33 / 45 RPM  
rocker switch



Durable Nickel  
coated Aluminum

# Better late than never!

After a Covid-imposed hiatus, Audiojumble is back! Martin Pipe went to the May event.

**T**he two Sunday Audiojumbles – one in October, the other in February – are key dates for hi-fi enthusiasts living within practical travelling distance of Tonbridge in Kent (UK). I was fortunate enough to attend the Audiojumble in February 2020, and at the time we were hearing worrying things about a nasty virus that had taken hold in China. That was Covid 19 of course. Life was, for so many people, put on hold – or worse. The organisers did attempt to kick off the event again, in September 2021 and then this February 2022 but were forced to postpone. However, you can't keep a good idea down and the third rescheduling – May 29th 2022 – went ahead as planned, the 30th anniversary.

Show founder John Howes was pleased to be back. "We're social animals" he said "but it's good to see stuff 'in the flesh' too".

He wasn't the only one. Denied their Audiojumble fix for the best part of two and a half years, there were plenty of early birds chomping at the bit to pay their £20 and get in at 8.30am – only 45 minutes after stallholders started trundling their wares into the Angel Centre.

The variety of said goodies is enormous, as our photos suggest. As well as hi-fi and recorded music in every conceivable format, there were electronic components (including valves), collectables of various sorts, vintage radios, ex-studio and broadcast gear, musical instruments, photographic gear and a wide range of recording equipment both analogue and digital. This year there was,



for some reason, a glut of microphones...

Audiojumbles are less hectic and pressured than the typical hi-fi show, and they are friendlier affairs with plenty of opportunities to discuss relevant subjects with other enthusiasts. One guy I spoke to was an avid reader of this magazine, having all its DIY Supplements. We both noted fewer foreign visitors than usual – such punters tend to go on buying binges, filling up shopping trollies with kit. Their absence, plus an unpredictable UK economy meant that business wasn't quite as brisk as in the past. The aforementioned seller admitted that it was nevertheless "good fun...they're get-togethers as much as anything...if you shift a few bits and pieces, then great!"

Staggered entry times are a key element of the Audiojumble proposition. As well as the 8.30 start, there are 9.30 (£12) and 10.30 (£7) 'waves'. Queues begin to snake around the perimeter of

the hall, well in advance of these. Naturally, showgoers who pay a premium to turn up at the very start get first pick of the items – but prices tend to be high at the beginning, especially for rare and desirable items. Later in the day, stall holders are more amenable to offers. Towards the end of the event, you can snag a real bargain if the seller doesn't want to cart his stuff back home again. Some items are simply given away at closing time: one lucky punter went home with a pair of early-1980s B&W floorstanders. Bargains, freebies and a prospect of a fun day aren't the only draws – parking at the Angel Centre remains free!

*The next Audiojumble takes place on Sunday 2nd October 2022 at the Angel Leisure Centre, Tonbridge, Kent TN9 1SF. [www.audiojumble.co.uk](http://www.audiojumble.co.uk). Hope to see you there!*

*Words: Martin Pipe*

*Pictures: Martin Pipe and Adrian Caspersz*



## SHOW FEATURE



Described as one of the best preamps of the 1980s the DMC-10 from Californian outfit Spectral has only two inputs, one of them an excellent phono stage. This specimen was presumably a demo, as the top plate has been replaced by clear plastic. With the matching power supply, it was being offered for £2,400.



A non-functional Revox B215 cassette deck robustly-made 3-head 4-motor deck with Dolby B and C and auto-calibration, price £1k. What? Not much less than new and fully-working in the '80s. A passer-by chimes in: "I had loads of those...one ex-BBC...couldn't give 'em away! But in its time this Revox was considered one of the best – a collectors piece.



Also taking advantage of the cassette comeback was a stall holder offering new old stock (NOS) media from various sources - famous brands like BASF, Fuji, Maxell, Memorex, Scotch, Sony and TDK. Manufacturer-branded (e.g. Nakamichi) tapes are particularly prized by collectors, as is the zinc-framed TDK MA-R metal cassette. Also no stranger to photo shoots was a series of Teac cassettes with visible 'reel-to-reel' hubs.



A brand-new £1000 replica of the famous Leak Stereo 20, an iconic 1958 design with EL84 pairs delivering 10 Watts per channel in push-pull. This item was based on a PCB from English Acoustics but built privately. They are, I was assured, "dead silent...put your ear to the speaker and you'll hear nothing". Is that good or bad? Looks nice though and likely sounds it. A bargain?



Here's a 'natural sound' JA-5101A flat drive unit, that manufacturer Yamaha often used in its 1970s electronic organs. With an unusual 25in x 18in plastic diaphragm, it was claimed to mimic the sounding boards of instruments like violins and pianos. This one, in excellent condition, was just £25.



Here's an Onkyo CP-1055F quartz-locked direct-drive turntable, described by the seller as 'classy...serious kit'. It was in as-new condition complete with instruction book. An automatic design with straight tonearm and MM cartridge, it would appeal to casual vinyl listeners. Just £220.





A Lampizator Big 7 (2015) from Poland - a hi-res DAC with tube preamp. The DAC section will only handle DSD files from a USB input. Its beautiful 101D directly-heated triodes were removed for safety. Price £3500, it originally sold for 10,000 or so.



This pristine Philips CD101 - "the second model made" by the Dutch giant - was playing music on John Howes's stand throughout the day. With its cast-metal casework, 'swing-arm' laser and 14-bit chipset, it was subject to 'serious offers'.



Lots of equipment, from recording studios and broadcasters like the BBC, turns up at Audiojumbles. These Sony Walkmen Pro and MZ-R32 Minidisc portables were used by BBC radio reporters for newsgathering; in the background can be seen a couple of the Uher 4000 reel-to-reels that were an industry standard prior to that. The seller, an ex-BBC man, was asking £200 each for the cassette machines and £50 apiece for the MDs.



Boots - yup, the high-street chemist chain! - was a fairly serious audio retailer in the 1970s and early 1980s. 'Boots Audio' even had branded products, like this B200 cassette deck, a rebadged Aiwa AD-L200. The two-head machine has a fine bias control and fast-acting fluorescent metering. Described as 'serviced', this mechanical-transport front-loader bore a £140 price tag.



On sale at one stall were a clutch of Mayware cartridges (made in Japan, 1970s-80s) discovered by a woman, under the bed of her deceased father who was a hi-fi enthusiast. Brand new, they were being offered for £350 (the MC-7V), £120 (MC-2V) and £250 (MC-3L).



An H.H. Scott (USA) Type 310D-FM 'wideband broadcast monitor' circa 1961, and its companion model 335 stereo decoder, from the tube era - the tuner alone has ten tubes. This sophisticated duo could have been yours for a mere £350 - a collector's bargain.



# Wire? Where?

Almost wire free, KEF's LS50 Wireless II loudspeakers intrigue Noel Keywood.



**W**hen is a loudspeaker not a loudspeaker? Answer: when it is one of these. Nothing like a quick riddle and this

one nicely sums up what you can expect from KEF's LS50 Wireless II. It's "not a loudspeaker" because there's little visual intrusion and little sonic intrusion onto music. And it is a streamer.

It is a loudspeaker when you walk into a shop, they ask you for £2499 (recently cut to £1999) and you try to carry them out. A total weight of 20.1kg (44lbs) is quoted – substantial for two

small loudspeakers each measuring 305mm high, 200mm wide and 311mm deep, fitted with what appears to be a single drive unit. Reason being each loudspeaker carries two amplifiers and power supply for them, unlike the usual arrangement of stereo amplifier in one cabinet only, with connection cable to the second passive (unpowered) cabinet.

Why do KEF do it differently? I presume for what most people would see as true wireless operation. Both of the KEF LS50 Wireless IIs have a mains connection, but can be run with no wire between them or anywhere

else. Do this and there is a 24/96 limit that raises issues, such as what happens to 24/192 and DSD? Turns out all inputs are converted to 24/96 PCM, so no native DSD. An optional ethernet linking cable is supplied that allows 24/192 PCM from Primary to Secondary cabinet.

The Primary cabinet carries the wireless streaming unit and an array of physical inputs. There is one analogue Aux Input via a 3.5mm stereo jack, sensitive enough to accept the low-ish output of an external phono stage, to play LP. There are optical and electrical S/PDIF digital inputs for direct connection of, say, a CD





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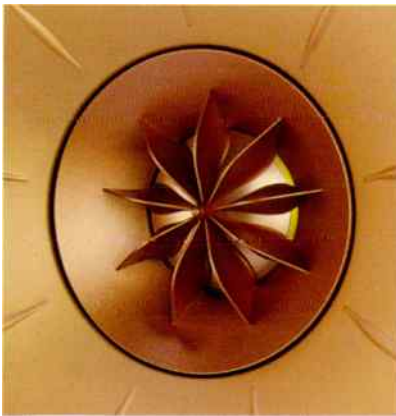


player or portable digital audio player (DAP) from their digital output, and there's an HDMI input to accept TV sound from an ARC return channel. There are no balanced inputs nor internal phono stage.

Bluetooth 4.2 radio linking is fitted, which lacks the later LE2 hi-res codec in 5.0 and higher, so CD quality here and not the hi-res performance I am now measuring with Bluetooth 5.0 and higher – a bit of a shame. Hi-res from Bluetooth sounds really good I've found.

"A sunlit presentation brimming with fine detail. Forward and vivacious, yet smooth and sophisticated"

The system must be linked into the home network (or direct to a router) to work at all, and in Wireless II form has a single combined setup/control app. that in my case established a wi-fi link quickly with no need to enter password (it's communicated by the 'phone). Operation is also by a small, simple remote control unit, or control panel on the Primary cabinet, but with no warning lights



**At centre of the Uni-Q drive unit lies an aluminium dome tweeter with Tangerine waveguide to disperse small problems caused by a symmetrical profile.**

or volume level display. However, input selection can be read on the display panel and volume can be adjusted there too. The app. provides greater functionality though.

Once up and running the

system insisted on a software update immediately or that night with no 'later' opt out, installing KEF Connect iOS to 1.12.1 in a few minutes. The speaker was up to date at Firmware Version 2.3.

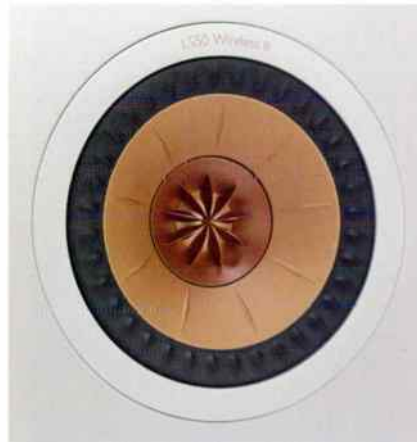
Register through the app. when setting up and it has a tight link into KEF either directly or through an external account. Possibly because I used my Apple account, a link appeared to the KEF website in my web browser, sent from the iPhone – which was surprising – I have not come across such cross linkage before.

Once connected into my network the Mac (Mojave) saw the KEFs as an Airplay device that I could push-play to, which I did using Audirvana+ that confirmed Airplay's CD quality only. My PC (Windows 10) was seen as a UPnP server by the app., enabling its entire music library to be played. In case you are wondering, all of this is usual nowadays – push-play from a Mac, pull-play from a PC.

There were radio stations and some pre-loaded music streaming apps from Amazon, Deezer, Qobuz, Spotify and Tidal, all requiring a subscription.

The app. combines device set-up with a music player – and the device set-up menus are comprehensive. Curiously, Normal and Expert set-up modes differ substantially, Normal asking complex questions like how large is your room, and how well damped is your room (eh?). Expert doesn't bother with these parameters, instead offering treble lift/cut and bass extension, plus much more. These are all pre-sets: there are no real-time tone or EQ controls in the player.

Measurement showed that although the menus differed, their outcome did not. In the Normal menu, Large room lifted bass by a small +1dB, and so did Extra Bass in the Expert Menu. There was strong bass cut in the Desk and Wall modes and useful treble level adjustment in the Expert menu. It



**The single Uni-Q drive unit has a tweeter at centre, with bass/mid-range cone surrounding it, held by a pleated suspension (black). The two form a coherent point-source unmatched elsewhere.**

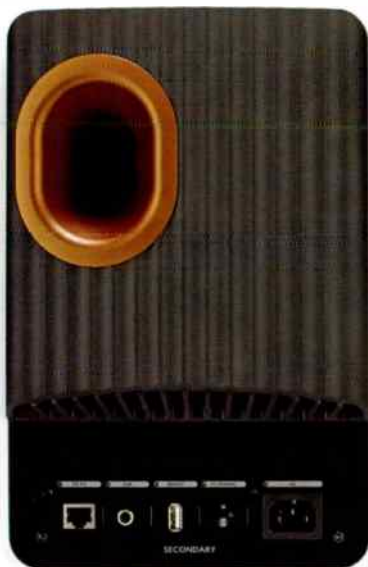
was all curiously confusing I felt for what was, underneath, fairly simple functionality. Whichever menu is chosen its settings can be saved as a Profile.

The music player did not see my iPhone library in Bluetooth mode; I used a separate Onkyo HF music player for this and found the KEF app. echoed its basic controls. Not sure I have seen such piggybacking before; this is an advanced app.



**At rear, a large port to control bass behaviour, sitting within a heatsink to cool the treble and bass power amplifiers. This is the Primary cabinet with an array of inputs including an RJ45 ethernet socket for network connection.**





*The Secondary cabinet is also mains powered and communicates wirelessly with the Primary cabinet, up to 24/96 hi-res PCM digital quality.*

The reason KEF do not offer bass lift options is that a small drive

unit cannot be pushed too hard at low frequencies and this brings me to the subwoofer outputs on each 'speaker and the app's Subwoofer out section with adjustable high and low pass frequencies, mono/stereo, polarity and more. It's comprehensive in its variety of options.

A head scratcher was KEF's recommendation of 5GHz wi-fi, the system's use of 2.4GHz by default and no network settings menu in the app to change this. I can only presume turning off 2.4GHz at the router would force use of 5GHz but I did not try this.

This is a two-way loudspeaker with 25mm (1in) aluminium dome tweeter positioned at centre of a 130mm (5.25in) magnesium/aluminium cone bass/midrange unit, crossover between them being at 2kHz measurement showed. Output from the tweeter can be raised or lowered by 3dB in the app. It's an all-in-one driver KEF call Uni-Q, with Tangerine waveguide in front of the tweeter

dome, the rear vented with Metamaterial Absorption Technology and – clearly visible – stiffening ribs/wave-breaks in the bass/mid cone. Reflex loading is used, with a rear port.

Each cabinet carries a 280W Class D amplifier driving the bass unit and a 100W Class A/B for the tweeter. All the many filter functions and crossover are performed in a digital signal processor (DSP) ahead of the power amplifiers, so pass through an (unspecified) DAC, suggesting the analogue Aux input passes through an ADC. The DSP can apply phase correction to improve wave shape.



**SOUND QUALITY**

In the spirit of wireless convenience I used the KEFs with their 24/96 wireless 'speaker link, wi-fi connected to my home network. With mains cables taped to stands this gives the appearance of wire-free usage. Hi-res and CD music files were played from a PC (Windows 10) acting as a music server, mimicking external commercial music streaming services.

Also, music from an iPhone 11X Pro was streamed via Bluetooth, using Onkyo HF player in hi-res form loaded with 24/96 PCM and DSD (transmitted as 24/48 PCM). Special mention for DSD here, because in spite of what KEF state in their specs the LS50 Wireless IIs would not see my DSD library on the PC ("failed to retrieve content"), with both .dff and .dsf files. This isn't going to mean much to most users but for sheer fidelity and listening pleasure I go to DSD first, so was disappointed. Otherwise, the KEFs saw and played all the PCM music files I have, that covers all those from external streaming services.

A quick snapshot of the sound: the light alloy cones give a sunlit presentation – not dark or warm – brimming with fine detail. Forward and vivacious, yet smooth and sophisticated too, because KEF do not raise treble for showroom effect. There's a fairly full bodied



*These are complex loudspeakers with many parts. KEF's User Manual is important and, beneath it in this shot lies the remote control, mains cable at right and long ethernet lead at left to install a 24/192 resolution wired link between the loudspeakers for those who feel they need it.*



**At top of the Primary cabinet lies a touch panel that provides direct control, should the remote get lost and the app fail to start (or whatever!).**

**Both cabinets have a contoured front face that disperses waves smoothly outward to help resolve stereo images. The Uni-Q drive unit is set flush to avoid ridges that impede surface waves.**

sound with fast upper bass but little deep bass. With Dadawa's Canton Story (CD) the dramatic drum strikes were punchy and well time-chiselled, if lacking the heft of bigger speakers.

Daft Punk's Giorgio by Moroder with its heavy, synthesised electro drum beat came over as clean and defined, solid if not heavy. Safri Duo's Samb Adagio was similarly fast and clean – seemingly pacy – with great sense of dynamic punch, if lacking low end shudder.

With Bluetooth, raising bass in Onkyo HF player's EQ system gave a little extra weight before the sound got spongy. This is a high quality loudspeaker best suited to a small room – up to 16ft long – that will suit/compensate its modes. For bigger rooms and/or deeper bass a subwoofer would help, explaining why provision for a subwoofer is so extensive.

But there is more to be appreciated than just bass. Also very obvious was the sheer smoothness of the sound, apparent as John Coltrane's sax cruised through It's Easy To Remember (24/96). My treble torture track,

Nils Lofgren's Keith Don't Go (CD) was an easy listen, upper treble sounding quite sweet from KEF's tweeter, where it often sounds lacerative from others.

Imaging was very good, if quite tightly defined in a shallow arc between the speakers; Uni-Q drive units give a very focussed sound, more complementary to Rock than big orchestras in terms of perceived scale and space.

**CONCLUSION**

What you get here looks like a pair of hi-fi loudspeakers but in practice is a complete hi-fi system, with very little left out. A lot for the money.

It isn't for the faint of heart: network connection is required and primary control is via an app. but I encountered no problems during set-up or operation, other than lack of DSD replay. A remote control is provided and if this disappears behind the settee then there are controls on the active speaker.

Sound quality was pristine in its detail, clarity and smoothness. It doesn't get much better than this as small loudspeakers go: KEF insist on smoothness and accuracy, making the loudspeaker seemingly disappear it is so neutral. The music by way of contrast shines through. A sophisticated package then at what is a very reasonable, even low price.

**MEASURED PERFORMANCE**

Our frequency response analysis shows a classic KEF result of smooth output across the audio band, especially at high frequencies. The importance of this is not just that of theoretical accuracy, but of avoiding the colouration that comes from local resonances that cause response aberrations. The ruler flat result out to 20kHz is unusual and tells of a loudspeaker that will be free of its own character and therefore truthful to the music, due to its highly developed tweeter with smoothing Tangerine waveguides and Metamaterial rear damping. A rare result even for modern loudspeakers.

Output below 600Hz rises to a +2dB plateau down to 100Hz, to add some warmth and body to the sound of what is a small loudspeaker. Without this type of correction small loudspeakers come across as dry and thin.

Bass rolls away below 80Hz and appears little corrected by amplifier EQ; these days EQ is commonly used to give flat output down to 40Hz. Little bass boost is available, 'big room' in the Normal menu and 'extra' in the Expert menu adding a tiny +1dB lift. The Wall

and Desk modes reduce bass. KEF let the rear port take over to produce low bass in conventional fashion, port frequency being 50Hz (red trace).

Voltage sensitivity measured 128mV (rms pink noise) input to Aux for 90dB at 1m (loud) – about as expected. A mobile 'phone's headphone output typically delivers 1V minimum so this is plenty enough to suit. A full scale digital input (0dB FS) via S/PDIF delivered 90dB at 1mV at low volume setting; Bluetooth 0dB was gain matched and identical, so there is gain ('volume') to spare.

The LS50 Wireless II measured very well in classic KEF fashion. This is a highly engineered loudspeaker. **NK**

**FREQUENCY RESPONSE**

**Green - driver output**  
**Red - port output**



**KEF LS50 WIRELESS II £1999**



**OUTSTANDING - amongst the best.**

**VALUE - keenly priced.**

**VERDICT**

Detailed, insightful sound and great all-round ability.

**FDR**

- clear, balanced sound
- very detailed
- wireless between speakers

**AGAINST**

- no USB music storage
- no DSD
- CD quality Bluetooth 4.2

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STEVE ELLIS

Finchley Boy  
Edsel

Although he was born in Edgware, Ellis started early in his musical career (aged fifteen) when he fronted the local North London outfit, Soul Survivors. They signed to CBS and changed their name to Love Affair. Whether he likes it or not, Ellis will always be associated with that 60s group, and their subsequent hit single, dripping in power-soul vibrations, Everlasting Love.

But that's not Steve Ellis. Not all of it. As this 10CD box set shows. The first CD is packed with Love Affair recordings. CD2 includes a lost Ellis LP, recorded in 1969 while CD3 features a Joe Orton soundtrack for the film version of 'Loot', CD4 pairs him with Zoot Money and two albums released in 1972.

After that is Widowmaker on CD5 with Ariel Bender (Mott The Hoople) and Huw Lloyd Langton (Hawkwind). In 1976 we

look at 'the Last Angry Man' solo album (CD6), 'Basement Days' in 1983 (CD7), 'Best of Days' (CD8) including work with Paul Weller plus the Steve Marriott memorial concert work (CD9) and the latest album on CD10, 'Boom! Bang! Twang!' from 2018.

I'm not a fan of the included booklet. From page 16, it's packed with excellent track/credit information, rare photos and more. Before page 16, most of the photographs are crazily small and the font is so tiny as to be on the sub-atomic scale. I struggled to read it. What I did manage to read was absolutely fascinating but the mechanics of reading was difficult. A long box format would have been a better production choice here.

As for mastering? A nicely balanced combination of energy and neutrality. There's a host of sources over time here so presentation varies but I was happy to hear a generally balanced delivery.



STEELEYE SPAN

Good Times of Old England: Steeleye Span  
1972-1983  
Chrysalis

In many ways, despite its venture into the early eighties, this 12CD box set has been created to tackle the seventies and to bring a sense of order and – well – closure onto the work from the band from the time. OK, apart from BBC sessions which we still hope to see in the future but, even so, this set goes a long way in addressing gaps and misses.

Of the twelve discs here, nine feature studio works with extra tracks, which are nice to have and look good in their card sleeves.

They include: 'Below the Salt' (1972); 'Parcel of Rogues' (1973); 'Now We are Six' (1974); 'Commoners Crown' (1975); 'All Around My Hat' (1975), 'Rocket Cottage' (1976); 'Storm Force 10' (1977) and 'Sails Of Silver' (1980) plus 'Live at Last' (1978).

Of particular note though are two live concerts. The first is from the Rainbow Theatre in London from 1974. The second examines

the 1976 US Tour, in particular Boston Berklee Performance Centre.

Both of these concerts represent the very first time that the band have been featured in an officially released live concert.

You'll also find a 1982 Australian tour concert, released in Australia as 'On Tour' and later 'Gone to Australia' in 2001. There are additional tracks from the 'Live at Last' concert, for the first time here.

Also look out for two previously unreleased tracks: 'Singing the Travels (1972) and Devil's Dream (1975).

I'm particularly happy to hear about the 'New York Girls' outage featuring the Goon voices of Peter Sellers.

In mastering terms? It has been 'enhanced' or compressed a little to add midrange emphasis although there's nothing egregious there. There is folk articulation alongside the rock foundation.

**A** heavy rock band from the seventies, the group had familial ties with the group, Free. Leaf Hound brothers Derek and Stuart Brooks were ex-members of South London outfit, Black Cat Bones, that at one time featured Free's Paul Kossoff.

After Black Cat Bones, the pair created a new outfit with lead guitarist Mick Halls and vocalist Peter French. They called it Leaf Hound. A name they grabbed from a Ray Bradbury story about a dog that come back from the dead covered in mud and leaves.

The band's high-energy delivery soon found them a contract offer from Decca in 1969. The album 'Growers of Mushrooms' was the first fruit of that contract. An album that took all of eleven hours to create, apparently.

To begin, the album was released in Germany via Telefunken, although it was edited. Fans of the band should note that the German

version of the album removes two tracks from the UK variant but does include a poster. The Decca release didn't appear until 1971.

I'd love to know why Decca took its time. I suppose the band would too because, by the time Decca decided to move on the album, the group had split. French made it to Atomic Rooster, then Cactus.

The album has been newly reissued in a gatefold sleeve alongside another release, 'Unleashed', a 2007 release also in a gatefold. Original singer French put together a new Leaf Hound band for this release.

The pair of albums are presented in a sturdy slip case. It's a nicely presented, stylish package.

Mastering? There is some compression here so upper mids and treble are a little lively, especially around the lead guitar and vocal crescendos but the soundstage is very wide and the experience is full on rock.



LEAF HOUND

Growers of Mushroom/  
Unleashed  
Repertoire

**B**obby Bare is one of those characters that – wholly unfairly – are often ignored. Mainly because he didn't make enough noise. His laid back way of looking at life was a trait I'd like to see more of from music artists, to be honest.

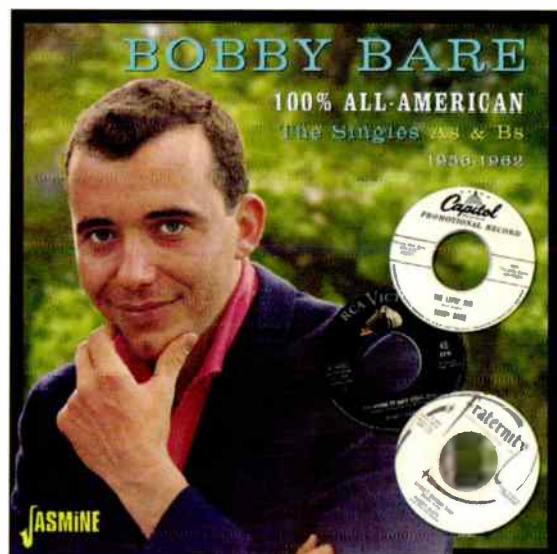
And yet he was effective in his own sweet way. He was influential. He made things happen. If you like your country outlaws, if you appreciate the likes of Waylon Jennings, Johnny Cash and Kris Kristofferson, then you should look at Bobby Bare who existed in the orbits of all of these men.

If Bare shouted at all, he shouted about the talent of Kristofferson, he secured Jennings his first record deal and he looked to Cash when creating his own themed country LPs instead releasing a lucky bag of crumpled songs.

Bare had no early family life, he was working on factories when he was 15, he had a hard childhood. He did his time in the Army and roomed with Willie Nelson afterwards.

Musically, Bare would explore fusion: folk/country, rock/country – but for this compilation we're looking at pop/country. Recording for a range of labels and touring with the likes of Roy Orbison and Bobby Darin, Bare even wrote pop songs for other singers. At the end of 1962, Bare would re-enter the country fold but for a time, he was a pop fixture crafting quality pop.

In mastering terms? Let's not forget, this is a compilation so you hear narrow-stage mono, wide soundstage mono, proto-stereo with vocals on one channel, plus a couple of mature-sounding stereos. On the whole, mastering is good to very good. I was happy with the presentation.



BOBBY BARE

100% All American: The Singles  
As & Bs 1956-1962  
Jasmine



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– an experienced reviewer**

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**Just listen and you’ll know**

Digital: Accoustic Arts, CEC, Quiescent Vinyl: B.M.C. Audio, Graham, My Sonic Lab, Spiral Groove, Transfiguration.

Tuners: Magnum Dynalab. Amplifiers: B.M.C. Audio, Quiescent, Storm Audio, VTL.

Loudspeakers: Kalsar – Vivace & Chiara Cables: Quiescent, VertexAQ.

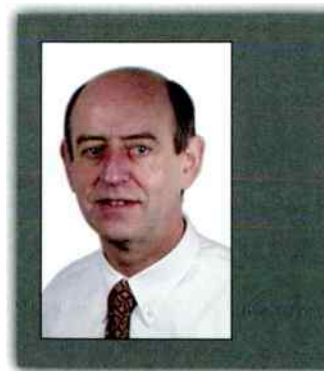
Mains: Quiescent, Vertex AQ. Supports: Arcel, Hi-Fi Racks, LeadingEdge, Quiescent. Room Acoustics: LeadingEdge.

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# "With headphones an amber flashing light goes on and warning sirens start"



Noel Keywood

**H**eadphones have become a world unto themselves. How did this happen? Why don't people want to use loudspeakers any more? Was it because

local councils across Britain got strenuous about "noise abatement in the local community"? Don't think so. My local council can be pretty strenuous but I haven't been deported to study sheep farming in Mongolia yet.

No, it's changing fashion, the rise of the mobile 'phone pushing aside even that recent wonder, the home computer. Remember them? When Windows 98 was released 23 years ago it made headline news: the world was in awe. Not anymore. Big, clunky home computers with their whirring fans and endless problems were ousted by iPads and iPhones toting equivalent power, strengthened by an endless sea of apps. Just add headphones and you're away into another world. With billions of such devices worldwide, the market for matching headphones is astronomic.

And how this has changed headphone fashion. Users moved from earbuds to bulky, clumsy looking over-ears in quick step for better sound quality, something that surprised me. I thought most users were listening to games, conversations and such like, where quality is not an issue. In reality a lot of them must have been listening to music – where quality matters. Why else would you spend hundreds to clamp a big device over your head?

I've worn lightweight AKGs outdoors in the past but never a full over-ear type like my Oppo PM1 magnetic-planars (£1k); they stay at home. So these users are seemingly more into quality than me – outrageous! But heartening. Quality is important to their appreciation of music, which is what it is all about.

A popular model, my son tells me,

are Audio Technica ATH-MX50 (£120). So I nicked his – and very good they are too. Typical Audio Technica, which means fundamentally well engineered and correct, if with obvious treble to give a light, insightful sound.

So not Beats – that fad is over. I haven't seen a pair of Beats headphones, known for excessive bass, for a long time now. Reason is Apple bought the company in 2014 for \$3billion, removed them as competition and have released their own bass heavy (if on-line measurements are correct) AirPods Max 'phones. The Audio Technicas are a fundamental opposite to Beats/Apples. Young ears are homing in on high fidelity.

Somewhere between those house sounds of excessive bass or excessive treble lies a more truthful take on things and here I currently have a struggle. When I clamp headphones to my head and have a listen, an amber flashing light goes on and warning sirens start. And they all do this, except the best Audezes where something like a perfect sound has been achieved. Even my long lasting Oppos, as lovely as they are, could do with less warmth and more zing.

But how much more I wonder? I am struggling to define just how much by measurement to determine what is right and what is not. Unfortunately, measuring headphones is no straightforward business, and correlating result to perceived experience is far less certain than with loudspeakers.

There are unexpected and peculiar variables such as effectiveness of the acoustic seal against the head, and position of drive unit relative to ear canal, measurement shows – and you can hear this by pressing earpieces against head strongly to raise bass, and moving them around to alter treble level. This makes getting a stable and certain measurement from headphones

difficult.

And how about this. If width between ears is small then bass seal will be poor and bass weak; I have large width between ears so I will hear stronger bass than most people. Since we all have different size/shape ears, head widths and ear canal entrances, this becomes a deeply bizarre topic!

What is correct? With headphones it is difficult to know. And reading what others have to say gives me little confidence anyone knows. There is a European standard head of course – how could there not be? – as defined by IEC 60268-7, but somehow I don't think it – and associated Head Related Transfer Function (HRTF) – will solve my ability to link what I measure to what I hear, or publish graphical data that can convey response differences to readers in useful fashion. And if you cannot do this there's no point in making measurements.

I've found that horn coupling of earpiece to measuring mic gives a consistent and meaningful result, one that reliably shows headphones differ vastly in measured frequency response. Some are flat, others have an HRTF dip at 3kHz – a big difference in the upper midband. The HRTF dip is notionally correct but not even Audio Technica bother – something that surprised me.

For smooth bass, output should run flat down to 20Hz but often does not, being affected by ear pad air seal and other weird factors. Treble levels above 7kHz are all over the place, my Oppos having 15dB less treble than my son's Audio Technicas. Absurd.

With headphones, it's the Wild West out there; the notion of sonic accuracy barely exists. Perhaps this is what makes them attractive – variety. It's a lot different from the world of accurate loudspeakers. And bewildering! ●



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“Your ears have nothing to do with what you ‘hear’. What you experience is called expectation bias.”



Paul Rigby

**A** good few years back, I decided to enter the grizzly world of the Internet. I started my own website, my own YouTube channel and my own Group on Facebook. I set up pages on Twitter, Instagram, Tumblr and Pinterest. Even LinkedIn. They all still exist and are thriving nicely, thank you. I've done my best to converse with the World Wide Wibble.

But it's an odd place, I have to say. We are rather cosseted here in the land of the Hi-Fi magazine. A lot of the concepts and the beliefs that we take for granted are not only foreign to most users who frequent Facebook, YouTube and the like, they are violently challenged and no amount of (what I would like to terms as) reasoned argument will shift them from their entrenched view.

I converse and debate but I tend to pick my moments or respond to a specific plea for help before I open my big mouth.

Even so, I can't help but cringe at the urban myths that floated and still roam the Internet highways to this day. Doomed to be brought up, again and again, by those who seem happier to trot out old conspiracies and folk tales than to undertake any form of independent research of their own. Here's just a few of the old stagers.

1: Dealers are rip-off merchants who will fleece you of your money in exchange for any old tat that they can get their hands on.

And sure, of course they do. They're actually controlled by the Illuminati, they deposit their ill gotten gains in a huge vault that was scooped out of the base of The Rockies and they all

take orders direct from Rupert Murdoch.

But what about the many happy hi-fi users out there who appear to be satisfied with their purchases? Easy. That coffee they give you when you demo your hi-fi kit while sitting on their sofa? Drugged. The dealers hypnotise you into believing you're having a great time.

2: Cables (and fuses and power blocks and...) are a rip off.

I can see where this one comes from. Cables, for example, are bits of wire aren't it? I had my own doubts, in the early days. But I actually took the trouble to demo and test the things. I heard (and still hear) sonic differences. I think half the problem is that cables don't have an on/off switch or VU meters. If they don't have those, they can't be doing anything worthwhile, can they?

3: Ones and zeros.

Streaming and digital sound are perfect, they say. Because they're digital. Because they're based on ones and zeros and because they can't be changed. I hear this trope all of the time.

Sure, digital is useful. I use digital. But it ain't perfect. It's...fine. It will get better. It will become wonderful. But it's got a way to go.

Part of the issue isn't so much the format (although that does matter, as Noel mentioned a couple of issues back) but the delivery system. Take a vinyl disc: a music container of a fixed, very high resolution. You play it on my own high-end turntable and that disc will sound sublime. Play it on a crappy Crosley and it will sound pathetic. The disc hasn't changed. The high-resolution signal hasn't changed. The delivery system has, though. But that argument doesn't seem to matter to many Internet

users because, you know, ones and zeros. Perfect, aren't they?

4: Ears.

Now we use measuring equipment for the reviews in this magazine and the results are valuable to use as extra information to add to and inform your buying decisions but I would never base a purchase solely on measurements. A lot of Internet users would and do, though. What about the written review? Dealer advice? Reports from other users who might be able to provide insight on Internet forums? More than any of this – what about your ears?

“Your ears have nothing to do with what you ‘hear’. What you experience is called expectation bias.”

That was part of an actual reply I had from a viewer, on my YouTube channel a couple of days before I penned this column. Basically, he was saying that everything I heard was a lie. I needed to be told what to hear by a machine. Because they offer the only truth.

That sort of view makes me despair. More than that, it's actually scary.

I believe 'ears' are the finest measuring devices for sound there is. And of course I have bias. Music is an emotive subject. Its art. All art lives on emotion and bias. That's how it prospers. That's the point. Hi-fi is not the point. It's only the processor of that music. Of that art. Of that bias. Ultimately, no engineer can or will tell me what I can and cannot enjoy. The very idea smacks of a Big Brother society and a lack of freedom.

Right I'm off to check my messages on the Internet. Where's my tin hat? ●



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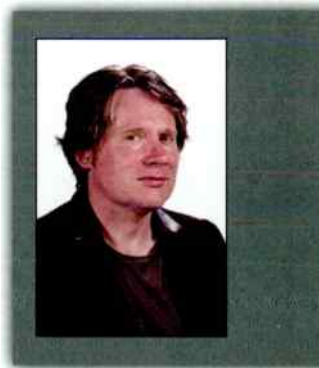
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# "Hopefully, this move onto the 'net won't impact revered institutions like the Proms"



Martin Pipe

Virgin Media (VM) subscribers like myself have recently been bombarded with crackly calls from non-English speakers who sound very much like scammers – not unexpected, during these uncertain times. My e-mail spam folder has rows of fake e-mails from banks and benefactors!

However, after further investigation it turns out that the calls are genuine. They are from a Filipino call-centre, to which VM has outsourced the duty of warning subscribers that their landline phone service is about to change. If they don't act now, their service will stop; in other words, just the sort of tactic we expect of fraudsters.

Evidently, notifying customers as cheaply as possible was the goal of VM – which, since 2013, has been owned by Liberty Global (how much does this multinational telecoms giant pay Richard Branson for the use of his brand I wonder?). If my experiences are anything to go by, the staff were insufficiently-trained – and their calls have been unnecessarily scaring VM's subscribers. A VM operative admitted that most of the calls she had been dealing with that day were from concerned customers. A VM PR claimed that explanatory letters had been sent out. I haven't however received one, and neither have any VM customers known to me.

So what are these changes? VM – which, unlike some of its competitors, isn't reliant on crumbling BT infrastructure patched together by Openreach – is migrating from an old-fashioned 'landline' phone system – PSTN, or 'Public Switched Telephone Network' – to an IP-based (Internet Protocol) one reliant on broadband

connections.

Competitors are also taking this 'Voice over IP' route, prompted by BT having made the decision to retire its PSTN by the end of 2025 ([bit.ly/3teQvBF](https://bit.ly/3teQvBF)).

Subscribers to VM will be issued with a 'dongle' that allows existing telephones to be plugged into the router, instead of the phone socket. Older routers (mine included!) are incompatible, and must be replaced. Hence those unsolicited calls, which were to arrange technician visits.

IP tech will be cheaper for VM, and indeed for rivals, but the benefits for customers are limited (some, including 'quick dial', are already phone features) although sound-quality could improve.

There are however significant disadvantages. If the existing phone socket is distant from the router, additional wiring will be required. Then there's the issue of how many 'phones can be simultaneously-connected to the line; you may, for example, have 'phones in the lounge, kitchen and bedrooms. The limit, on conventional landlines, is determined by the 'REN' (Ringer Equivalence Number). BT-approved (as they were!) telecoms devices are labelled with 'REN=x' numbers. Add together the RENs of connected equipment; a total of 4 can be supported by the average line. I asked VM's PR for the REN capabilities of its adaptor, but my question was ignored.

Conventional 'phones are powered 'off-the-line'. In the days past exchanges had racks of lead-acid batteries to keep things going when the power failed. Not so with VoIP, as powering the equipment at the domestic end is now your responsibility.

This has two implications. Firstly, you are now paying the energy bill! More seriously, if power

is cut to your router you lose the ability to make and receive phone calls.

For its part, VM explained that "an Emergency Backup Line" is provided at "no extra cost to customers who have accessibility needs or don't have a mobile phone".

If you do have a mobile phone, some will be asking, why bother to continue paying VM for a 'pseudo-landline'? Despite the lower costs of VoIP, VM will continue to charge 19p per minute for 'standard rate' landline calls.

Also putting more eggs in the broadband basket is the BBC, whose Director-General Tim Davie set out a savings-driven 'digital-first blueprint' in May. Amongst other things, this approach will shift "significant amounts of money into new programmes for iPlayer" and "resources in local output towards digital".

Hopefully, this move onto the 'net won't impact revered institutions like the Proms – which, for many listeners, alone justify the licence fee.

The 2022 Proms season is the first 'normal' one since the pandemic, happily-coinciding with the BBC's 100th anniversary, and will feature "large-scale repertoire not heard at the festival since 2019".

Kicking off on July 15th, the eight-week run will feature 84 concerts covering multiple styles. This year marks the welcome return of international orchestras en masse to the Proms, including the Berliner Philharmoniker, Philadelphia Orchestra, Vienna Radio SO, Australian World Orchestra, and newly-formed Ukrainian Freedom Orchestra. Much of this will be viewed over the internet, hopefully uninterrupted by a Filipino call centre! ●





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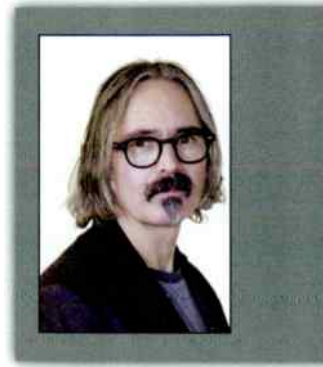
Featuring tracks originally recorded by Terry Allen, Priscilla Bowman, Rodney Crowell, Nick Lowe, The Rolling Stones, Sly Stone & The Texas Tornados, with two extra tracks—The Fratellis 'Whistle For The Choir' & 'Please Heart, You're Killing Me'.

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"This is a superb blend of covers & originals. Like a female Van Morrison, she swings from the Stones to Dave Edmunds and from country to jazz, the most booze-sodden balladry since the Pogues. McEvoy sounds like the sort of woman who might greet you with a bottle of red one night and a rolling pin the next". — Truck & Driver ★★★★★ *Album of the Month*

"This is a band album, rich with brass and Hammond organ, and we're back in the Sixties again in some smokey nightclub... Love Must Be Tough may have been around for a while but it still may be the best thing you'll hear this year." —Dai Jeffries *RnR, May 2021*

# "Bobby Graham was "the greatest drummer the UK has ever produced" said Talmy"



John Pickford

**T**here's a feature length documentary currently in production I'm most eager to watch when released. It's called *One More Time* and tells the story of the British session musicians of the 60s and 70s. I've always been fascinated with the unsung heroes of the vintage pop scene, the producers, recording engineers, arrangers and of course, the musicians.

Upon hearing about this upcoming film, I was reminded of a conversation I had not so long ago with a muso pal of mine about favourite guitar tones and performances. He mentioned the guitar on *Crossroads* and for a second we were at cross purposes because my friend was, of course, referring to Eric Clapton's blistering solo on Cream's version of the Robert Johnson blues standard, recorded live for the band's *Wheels of Fire* album.

My mind however, immediately leapt to *Crossroads*, the British TV soap opera, which aired several times a week between 1964 and 1988. The show's theme music – a long-time favourite of mine – began with a distinctive nine-note motif played on a Vox 12-string guitar. The player was Vic Flick, a member of the John Barry Seven and session musician extraordinaire; that's him playing the iconic guitar part on the James Bond theme.

While stories of the elite American session players, such as the Funk Brothers (Motown) and the Wrecking Crew (Beach Boys, Byrds, Phil Spector etc.) have been well documented, the British players remain relatively anonymous.

A select few – ace guitarist Big Jim Sullivan springs to mind – have attained a cult following, while

some others managed to carve out successful careers in the limelight later on.

Ritchie Blackmore was just 17 years old when he joined independent producer Joe Meek's house band *The Outlaws* in 1963, five years before forming *Deep Purple*. And when Jimmy Page gave up strumming on Val Doonican and Lulu records, he joined floundering hit makers *The Yardbirds* before teaming up with John Paul Jones (fresh from arranging Herman's Hermits tracks for producer Mickie Most), to form *Led Zeppelin*.

Page's original choice of drummer for *Led Zep* was Clem Cattini, who turned down the gig because session work – three sessions per day – seemed more lucrative and reliable. And who could blame him? He has played on 42 UK number one hits, more than any other musician, as well as thousands of other hits and misses. Just looking at his chart-topping performances in 1971 and 1972 shows the diversity of his work; three T-Rex smashes (*Hot Love*, *Get It On* and *Telegram Sam*) sitting alongside novelty hits such as Benny Hill's 'Ernie (The Fastest Milkman in the West)' and Clive Dunn's lachrymose 'Grandad'.

The bass player on the latter, by the way, was Herbie Flowers, who was also responsible for the instantly recognisable bass part on the infinitely more street credible 'Walk On The Wild Side' by Lou Reed. These guys would – and could – play anything.

While most session players remained unknown to the public at large, some managed to ingratiate themselves with the rock royalty of the times. Keyboard legend Nicky Hopkins was the subject of the song *Session Man* by *The Kinks*,

arguably the fourth most important group of the 1960s. Yet he also played with the top three, namely *The Beatles*, *The Rolling Stones* and *The Who*...

Speaking of *The Kinks*, listen to their first two number one hits, *You Really Got Me* and *Tired Of Waiting For You* and hear how hard they swing. That's because producer Shel Talmy replaced *The Kinks'* Mick Avory with session drummer Bobby Graham. Talmy is quoted as saying Graham was "the greatest drummer the UK has ever produced." I'm inclined to agree with him.

I can't wait to hear the stories of the British session scene in the forthcoming *One More Time* film, but in the meantime I'll leave you with a couple of anecdotes (which may or may not be true) I recall hearing from Bobby Graham about his work with *The Dave Clark Five*.

Dave Clark was (and still is) a shrewd businessman and producer, however he publicly fronted his group from behind a drum kit. While he played live with the DC5, he sometimes employed Bobby Graham to play on the recordings while producing from the control room. Graham said that a Fleet Street journalist once rang him hoping to create a scandal by revealing that Dave Clark didn't play on his own hits. But Graham didn't take the bait and gave the hack a dismissive "not me, mate" response.

My favourite tale though, is the time Graham played a skilful drum roll on an early take of a prospective DC5 single. Apparently, Clark aborted the take and got on the talkback microphone to address the drummer. "Bobby, can you play that again without the drum roll please? I've got to mime to it on TV!" ●



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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, pacy 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.

**MCINTOSH 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 SOLIO 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...

**AVIO 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.

**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 dubious used buy.

**DUAL CS905** 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.

**TOWNSHENO 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  
Beautiful 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 RB300, which added detail at the expense of warmth. Superb budget buy.

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

**TRIO LO-70** 1978 £600  
The best 'all-in-one' turntable package ever made. Clean, powerful and three-dimensional sound, ultimately limited by the tonearm.

**AOC ACCUTRAC 4000** 1976 £300  
Bonkers 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 PL120** 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 SONOEC 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 R011S** 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.

**GOLORING LENCO GL75** 1970 £15.6S  
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 T0124** 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.

**TONEARMS**

**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 Syrix 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 muscular, 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.

**HAOCCOCK 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 Supemait 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.

**SUGOEN 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.

**SUGOEN 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 1010** 2007 £3,295  
The clarity and openness of valves plus firm grip and fine detail make this a preamplifier masterclass.

**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 seminal 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

**ELECTROCOMPANIE 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 rarity 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 monoblocks - 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 686** 2007 £299  
Baby standmounters offer a sophisticated and mature performance that belies both their dimensions and price tag.

**B&O 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.

**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  
Smallish 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!



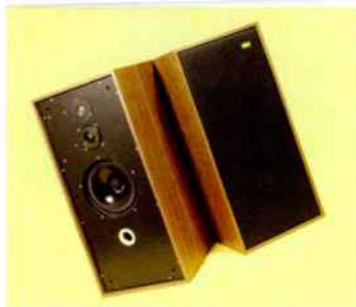
**JR 149** 1977 £120  
Cylindrical speaker was ignored for decades but now back in fashion! Based on classic KEF T27/B110 combo as seen in the BBC LS3/5a. Doesn't play loud, needs a powerful transistor amplifier, but has clarity and imaging.

**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.

**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.



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



**HH ELECTRONICS TPA-500 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.

**QUAO 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.

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

**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.



**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 IOECCO** £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 OYNALAB MO-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.

**MYRYAO 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...

**QUAO 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.



**NAO 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 MOOEL 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-JE55ES** 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.

**TECHNICS SL-P1200** 1987 £800

CD version of the Technics SL-1200 turntable. Massively built to withstand the rigour of 'pr' use and laden with facilities - a great eighties icon.

**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.

**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.

**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.

**VDH 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.



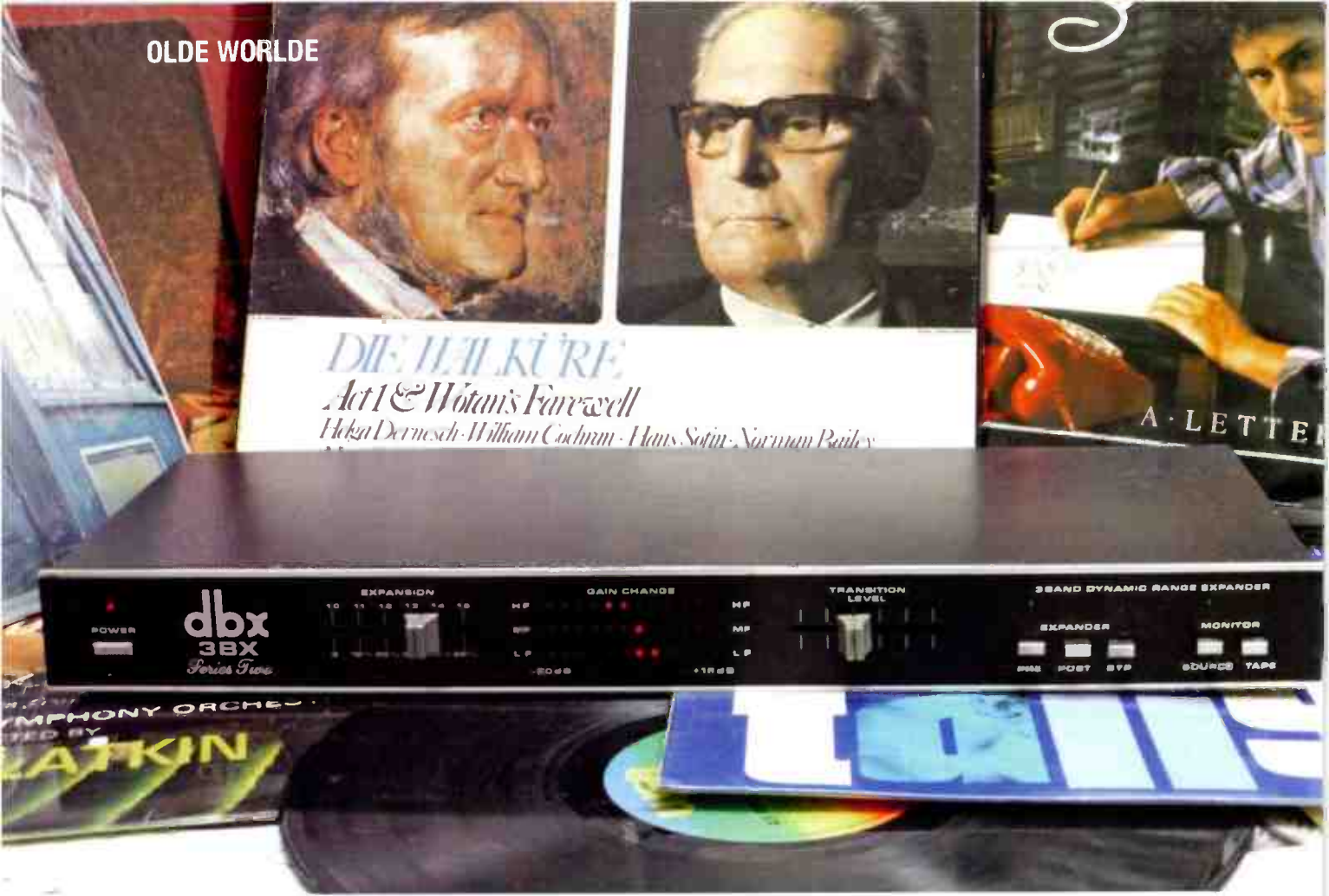
**WIREWORLD OASIS 5** 2003 £99/M

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.





# dbx 3bx Series Two

**Martin Pipe plays with his dynamics, thanks to an interesting three-band processor from the US.**

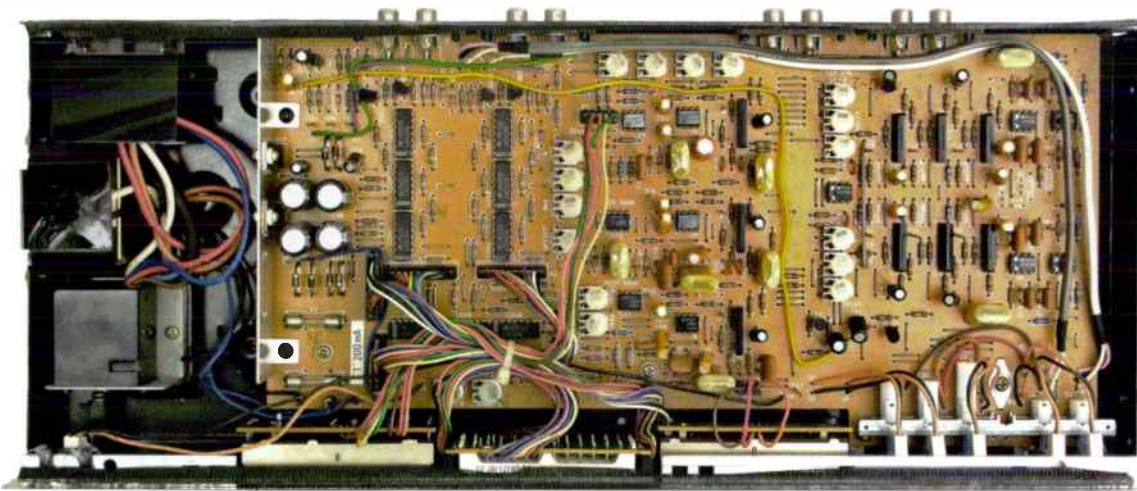
**A** few months ago this series featured a Sanyo NR55 companding noise-reduction system for analogue tape recorders. There were several firms producing mutually-incompatible units of this type, which promised a transformed dynamic range and signal-to-noise ratio improvements of 30dB or more. Basically they squashed the dynamic range for recording and expanded it again during playback,

bringing digital-like dynamics to analogue recordings while pretty much eliminating hiss – important if, as part of the creative process, multiple ‘generations’ of tape transfer were involved.

However there was usually a price to pay, in terms of an audible ‘pumping’ effect that marred (for example) voice and solo piano. Steely Dan used such technology when making their 1975 album *Katy Lied*, and regretted its impact on sound quality. Hardly surprising

that when the cost of digital fell, systems like this (and the associated analogue recorders) fell out of favour.

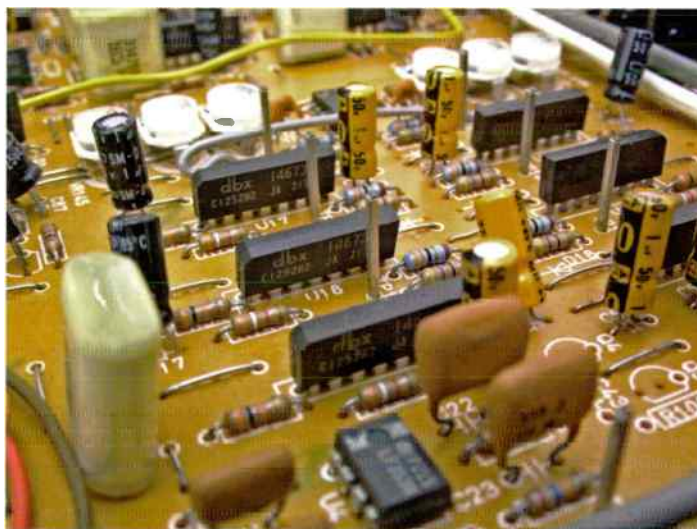
One of the earliest ‘hi-fi grade’ compander manufacturers was dbx, the stated goal of which was to “get closer to the realism of a live performance”. The Massachusetts-based firm made the ‘Type 1’ noise-reduction system that gave Steely Dan so much grief (Donald Fagen and Walter Becker allegedly refused to listen to the completed



**Busy but neat – the 3bx Series Two’s interior layout. Those nine custom chips apart, the unit relies on standard components like the 4558 dual op-amp.**

album). dbx’s magic boxes, which like other systems of its type employed a 2:1 companding ratio, contained linear-decibel (‘decilinear’) circuitry built around the Blackmer gain-cell (a precision ‘voltage controlled amplifier’ –VCA – originally developed for automated mixing desks) and RMS (root mean square) level detector invented by dbx founder David Blackmer. dbx subsequently introduced a ‘Type 2’ variant of its technology, optimised for consumer products - cassettes and slow-speed reel-to-reel, basically.

dbx brought this concept into the hi-fi era, with a series of stereo ‘dynamic range enhancers’ designed to be connected between line-level source and amplifier, or inserted into the amplifier’s tape loop. Built around sealed modules (later chips) containing Blackmer’s proprietary RMS detector (which monitors the incoming signal level) and VCA



**The 3bx Series Two relies on six of these dbx-designed uPC1252H2 VCA chips - each of the three bands requires two of ‘em. Few ‘audiophile-grade’ components are evident here!**

(which varies the output gain), the first model (the ‘117’) appeared in the mid-1970s.

In the late 1970s, dbx developed a new model – the 3bx – which divides the incoming audio into three bands covering ‘low’ (LF), ‘mid’ (MF) and ‘high’ (HF) frequencies. Pumping effects were claimed by dbx to be much lower than what went before

– especially, we’re told, for music with prominent basslines.

In 1982, the

year that Knight Rider first aired in the US, a new model of the 3bx – the ‘Series Two’ featured here – was introduced. Like the original, the 3bx Series Two was designed for insertion into a tape loop.

I was lucky to find my 3bx Series Two, missing a knob and in rather tatty condition, at a car boot sale. Some of the screws holding the cabinet together were conspicuously-absent, but for £3 I was happy to take a chance! The chips used in the internally-busy unit are dbx ‘specials’, and not particularly easy to get hold of. Occasionally, ‘new old stock’ (NOS) turns up on eBay, but you’re more likely to find specimens that have been de-soldered from equipment. One such chip, with the part number uPC1253H2 (‘146741’ on the



**If the switches get a lot of use – to say, compare the unprocessed and processed sound – they wear out. The unit featured here suffered this.**



# HI-FI WORLD

## ON THE APP STORE

The screenshot shows the App Store listing for the Hi-Fi World app. At the top, there's a navigation bar with 'Sign In', 'Music', 'Films', 'TV Programmes', 'App Store', 'Books', 'Podcasts', and 'iTunes U'. Below this, the breadcrumb trail reads 'App Store > Entertainment > audio web publishing ltd'. The app's icon is a red 'HI-FI WORLD' logo on a white background. To the right of the icon, the app name 'Hi-Fi World' is displayed with a '4+' rating, followed by the developer 'audio web publishing ltd'. Below the developer name are tabs for 'Details', 'Ratings and Reviews', and 'Related'. A 'Screenshots' section shows three preview images: the magazine cover for August 2015 featuring 'MISSION 770 loudspeakers', a 'contents' page with various audio equipment photos, and an 'AUGUST 2022' issue preview. On the left side of the app page, there's a 'Get' button, a note that the app is designed for both iPhone and iPad, and a 'Rating: 4+' section. Below the rating is a 'TOP IN-APP PURCHASES' list with 10 items, including monthly and yearly subscriptions. At the bottom left, there are 'LINKS' for 'Privacy Policy' and '© 2014 Hi-Fi World'. The 'Description' section states that the app brings the best hi-fi news from around the world, listing features like in-depth product reviews, expert opinions from renowned writers, and international standard measurements. The 'Information' section provides details about the developer (audio web publishing ltd), category (Entertainment), update date (7 Dec, 2014), version (1.0), size (9 MB), rating (Rated 4+), family sharing (Yes), compatibility (Requires iOS 5.0 or later), and language (English).

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*Sliders control the level of expansion - from 1.0:1 (none) from 1.5:1 (50%) - and the 'transition level'. This is the point at which lower signals are made quieter, and higher ones louder.*

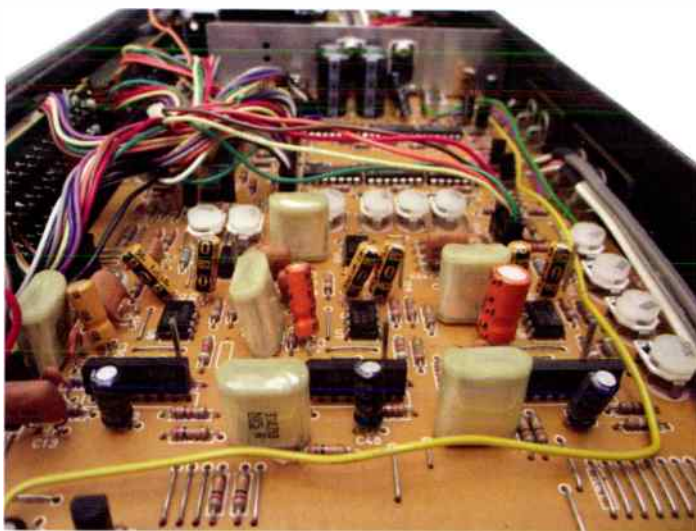
circuit diagram, mercifully appended to the operations manual that can be downloaded for free from the excellent Hi-Fi Engine website), performs RMS detector duties. One is needed for each band – i.e. three in all. The 3bx Series Two also relies on no fewer than six of dbx's other purpose-designed chip

none of the numerous internal setup presets had been disturbed!). I suspect it had been taken apart for one reason – to investigate signal intermittency! You can compare the unprocessed and processed audio using the front panel controls, to subjectively judge the benefits of expansion, and if

system could make to some LPs. Some musical elements leap out at you, and more 'excitement' is evident (a slight treble bias is, I guess, at least partially-responsible for the latter). Orchestral and vinyl-era prog rock (Genesis and Yes, for example) benefitted more than smaller-scale chamber works and jazz; dbx recommends using between 1.05:1 and 1.25:1 for classical and between 1.1:1 and 1.25:1 for rock and pop albums. For jazz, we're told, a good starting point is somewhere in between the classical and pop settings. Go too far, though, and the 'big' sound is unpleasantly fatiguing; too little and you might as well switch the unit out of circuit altogether. If the 'transition' control is advanced too far, peaks are spoilt by audible 'cracking' distortion – possibly the onset of clipping.

Even some CDs, notably reissues of albums released on vinyl during the 70s and 80s, can benefit. The 3bx is no miracle cure; don't expect it to, for example, make heavily-processed 21st-century FM radio more listenable. However, these units have their fans – used prices on eBay range from £100 to well over £1,000!

And what happened to dbx itself? At around the time the Series Two featured here was released, with a not-insignificant price tag of \$549, dbx was also dallying with studio digital recording equipment, hi-fi components and stereo sound systems for analogue TV. Interestingly the firm, which at one time belonged to the UK turntable manufacturer BSR, is still around today. Now part of the Samsung-owned Harman Group that also includes such famous brands as JBL, Arcam and Mark Levinson, today's dbx concentrates on pro-audio kit like studio compressor/limiters, 'de-essers', feedback prevention, equalisers and microphone preamps.



*Three uPC1253H2 chips perform RMS detector duties for the separate channels covering the 'LF', 'MF' and 'HF' bands. Note the large number of presets, which set up the unit. Calibration involves test equipment, so leave well alone!*

– the uPC1252H2 VCA, identified as '146731' on the circuit diagram. All of the other components are however standard, among them ubiquitous 4558 dual op-amps.

Luckily, my unit seemed to be fully-functional (and, better still,

this is done on a regular basis the switches stand more chance of wearing out. I got around the problem by using an external switch box.

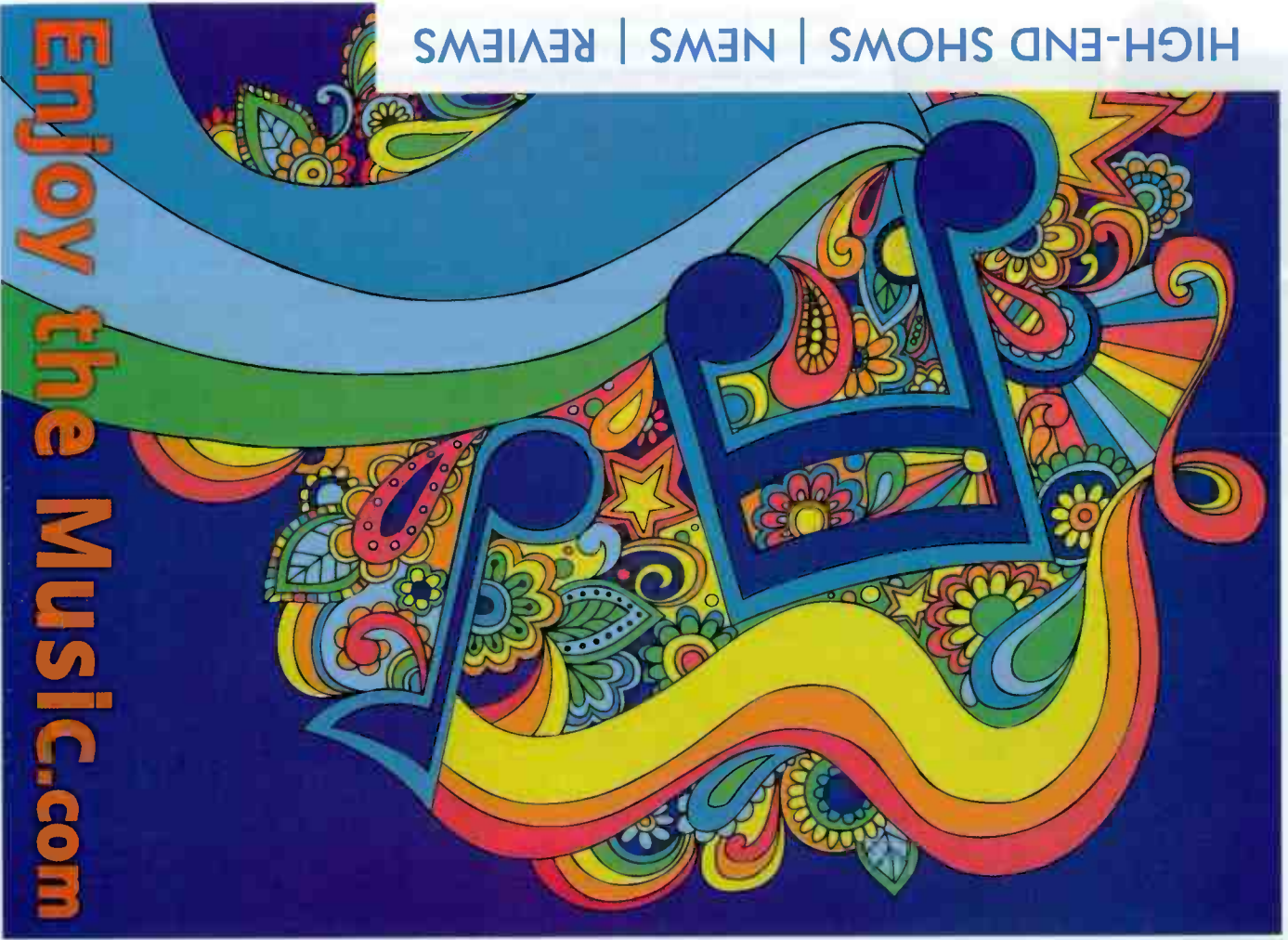
On the whole, I was impressed with the difference that dbx's



*'Pre' and 'post' buttons retrospectively determine whether the deck's input or output is expanded; in the former mode, the corrected signal is recorded. The bypass button allows the replay signal to be expanded.*



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# Lenco Blue

**A Bluetooth turntable from Lenco. Noel Keywood checks out their budget LBT-188WA.**

**T**he market for budget turntables is vast its seems, from the myriad of types sold on the 'net, notably from Amazon of course. Most come at

eye-poppingly low prices, including this do-it-all model from Lenco, the LBT-188VA. At around £220 for a two-speed belt drive with phono stage, Bluetooth wireless transmission and a USB digital output for

recording purposes. Is it really hi-fi? Can you get a decent turntable at such low cost? I looked at it closely.

Starting at the sharp end, Lenco fit Audio Technica's uber-budget AT-





**A solid deep gloss plinth of veneered MDF sits on three feet. Rotary controls provide speed change – 33rpm/45rpm – and start/stop. At right on the arm platform sits a manual cue lever with damped lowering. The controls worked smoothly.**

3600L cartridge that I wrote about at length in our April 2022 issue (see Rega Carbon). This is one amazing budget cartridge, good far beyond its open-market £35 price tag. Not a cheap ceramic type, it is a true moving magnet (MM) with insanely good tracking, even at its 2.5gm minimum tracking force. So think: hi-fi sound quality and no damage to valuable LPs. I'll get into finer details later.

As our pictures show the LBT-188WA is a good looker, with plenty of shiny aluminium set against a gloss lacquered, dark walnut veneer plinth. To keep dust off there is a well made clear acrylic cover that moves on friction hinges. Dimensionally it is much the same as most others, measuring 420mm wide, 360mm deep and 125mm high with lid closed. Open the lid however and you need 410mm height clearance, plus a shelf 430mm deep to accommodate the lid's rear overhang. Any shelf should be a firm one but with Bluetooth, finding a suitable site is made easier – assuming you'd want to use

Bluetooth: you may not.

The unit is no heavyweight, at 4.8kgs, it's three non-adjustable feet needing a level, vibration free surface, one unaffected by footfall.

This is seemingly a specialist turntable, meaning it comes with lots of bits and a surprisingly elaborate set-up process. What surprised me was the arm's anti-skate mechanism, comprising weight-on-thread. Not unusual but peculiarly wrought here with what the handbook says is a "fishing line" that must be "pulled slightly" to attach it to the arm. Er - yes. I've been setting up turntables for decades and have never come across this geometry or difficulty: the angle is so acute between thread and stub that the thread slips off unless tightened to

mate with groove. Got it to work in the end, but peculiarly ornate procedure for a budget arm. And the slip knot must be loosened to re-adjust bias force.



**A small d.c. servo motor with single pulley diameter. Speed is electronically controlled, but not adjustable. Speed stability from this motor was excellent.**

The arm is a specialised one-piece type with non-removable headshell, making cartridge changing difficult. When adjusting downforce there was slight memory-effect to movement in the

vertical plane, possibly from lead-out wires, that made getting a zero setting difficult so a stylus balance gauge was necessary. The horizontal plane bearing moved freely. In all then, arm set-up was difficult for a simple budget design, but perhaps this gives a good impression.

The arm is manually controlled using a damped lift lower lever – there are no auto-mechanisms. I had no difficulty using it, being light in the hand (I manually cue) and satisfactorily rigid.

–Turning the Start/Stop knob to Start span up the light alloy platter (33/45rpm) quickly and quietly. There are no lights on front, just an on/off main power rocker switch at rear. However, the unit shuts down after 20 minutes of non-use. Drive comes from a d.c. servo-motor, lacking speed adjustment.

Power comes from an external wall-wart delivering 12V so no mains earthing, in line with latest common practice. This eliminates the possibility of a mains hum loop and all but guarantees no hum. There is an earth terminal that holds the electronics to ground but not metal parts such as arm or



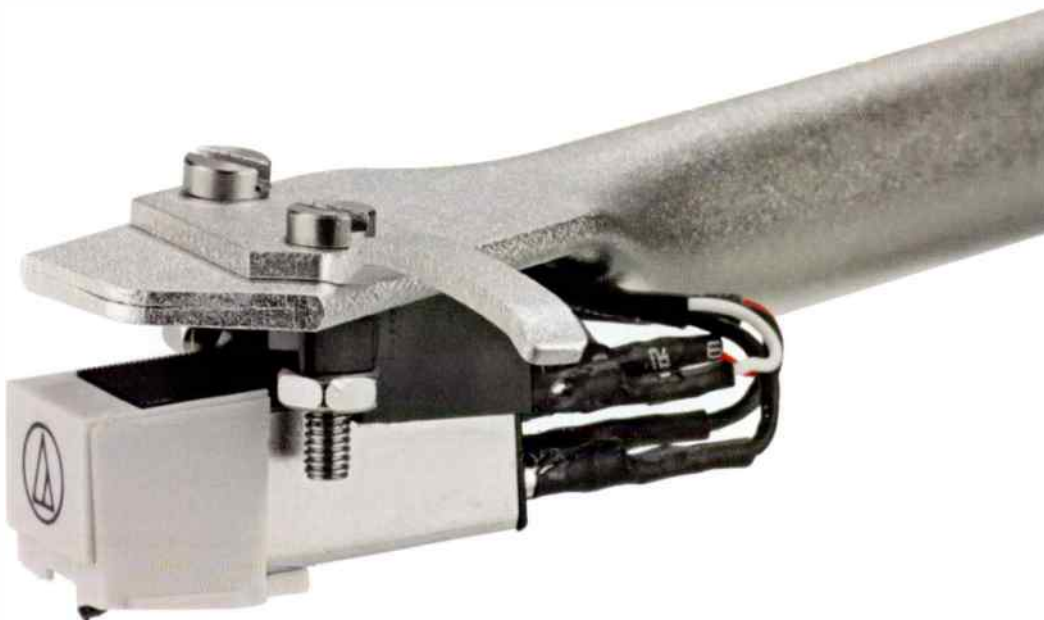
***The thread holding the anti-skate weight sits an acute angle to the grooved arm peg, so it slips off unless the thread's slip-knot is tightened. This makes adjustment a fiddle as the knot must first be loosened.***

control knobs. The AT-3600L metal screen was earthed however, as it needs to be.

At rear come the parts with implications. Here the LBT-188WA gets interestingly complicated.

Lenco suggest the USB output is used to make digital recordings on a computer using the free Audacity software editor. Ha-ha! It's a great app, that's for sure if not for beginners. Lenco do their best to explain the process. It's said this is an "MP3" output but I doubt it: standard PCM uncompressed I suspect, at 16bit resolution and 48kHz sample rate my Mac tells me. The term 'MP3' is meant to connect with those who'd like to produce a file for their 'MP3 player' – now an historic term.

"Digital quality was poor but as a glamorous conventional analogue vinyl spinner it is good value and well worth considering"



***The arm has a low-mass fixed headshell that allows good warp riding. Audio Technica's AT-3600L cartridge is light too.***



Budget digital outputs come via a cheap analogue-to-digital convertor (ADC) chip of poor quality. This one managed around 50dB dynamic range under test where 60dB is hoped for and 75dB decent. I've measured better ADCs even in budget turntables so this one is lacklustre.

Lenco fit a phono stage of limited gain and ability but it's adequate to get the show going. This allows connection into amplifiers lacking a Phono input, but volume will have to be turned up. A small slide switch removes this stage, delivering output from the cartridge direct to an external phono stage – by far the best option.

Lenco's User Manual states the LBT-188WA is Made in China by the Brightpower Optoelectronic Technology Co. but a web search shows them to be a manufacturer of lighting products. The d.c. servo motor, platter and bearing, and internal phono stage are much like those used in so many other turntables – including Audio Technica budget turntables sourced from China. However, the arm with its peculiar bias geometry is unlike others, so product origin is uncertain; Lenco are a Swiss company with a UK branch.

## SOUND QUALITY

I used the Lenco with our in-house Creek Voyage i20 amplifier driving

Martin Logan ESL-X hybrid electrostatic loudspeakers. The Creek has its own high quality phono stage, Bluetooth and Line inputs so was able to engage the Lenco via its many outputs.

Technically intrigued by the sound of low quality ADCs – which represent the unfortunate past-history of digital – I connected up via Bluetooth first. This was a peculiar experience because my Mac (Mojave) did not see it at all yet the Creek connected after a long interval of 10 minutes or so. Not the usual link-up with handshakes and all that, but it happened. And listening to Alison Goldfrap's Lovely to CU on Supernature was a sobering experience.

The music was there alright but it was a muggy generalisation with edginess from distortion. I was listening to output from the cheap ADC (rather than Bluetooth) and it wasn't nice. Recordings made via USB using Audacity were similar, when replayed from the computer through an Audiolab M-DAC+ driving Oppo PM1 headphones. As measurement suggested, digital quality was poor. Anyone hoping for the vinyl sound faithfully portrayed in digital form should look elsewhere.

Moving to Line output from the internal Phono stage the sound



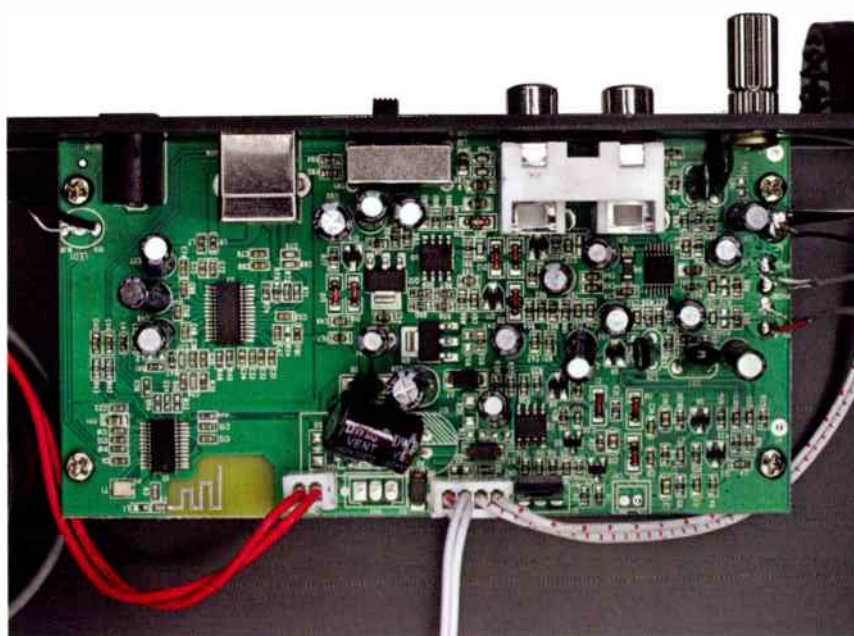
**The bearing has a brass taper to grip the alloy platter. The shaft is tightly machined for little play, contributing to speed stability.**

focused up and smoothed out into a genuine vinyl experience, but I moved on fairly quickly to direct connection to the Creek's Phono input, whereupon the sound stage opened up in depth and width terms, underpinned by strong bass drive from the AT-3600L cartridge. I know its amenable sound well, one free from the clatter of an aluminium cantilever – and the LBT-188WA conveyed that quality. It has a light patina to its sound and a lack of high-end depth or focus, but then the AT-3600 is a basic MM with conical stylus and the arm below Rega standard, so that is to be expected. At the low price it was a good representation of the vinyl experience, if a tad fast in tempo.

## CONCLUSION

As a basic two-speed, belt drive record deck the Lenco was a good performer. It's best connected up to an external phono stage but the internal one is acceptable at the price, being similar to others found in budget turntables. Whilst the arm will accept a better cartridge I'd be tempted to leave the excellent AT-3600L in place and not expect too much more. The digital side was disappointing, spoilt by a poor digital convertor.

The LBT-188WA a mixed bag then: those wanting decent digital should look elsewhere, from Project for example – but expect to pay more. As a glamorous conventional analogue vinyl spinner though it is very good value and well worth considering.



**Inside lies a complex circuit board with phono stage and analogue-to-digital convertor (ADC). At bottom lie the motor control electronics, and at left a USB interface and Bluetooth section with small on-board aerial – the squiggly bit at bottom left.**



A large plastic cover hides the phono stage, control electronics, USB stage and Bluetooth transmitter. The three feet are not height adjustable so a flat surface is needed.

## MEASURED PERFORMANCE

The 3150Hz test tone of a DIN 45-452 test disc varied from 3185-3191Hz on our Wow&Flutter meter, giving a nominal of 3166Hz which is +1.2% fast, a large error. A value of 1% pitch error is considered the limit of audibility, suggesting the LBT-188WA will sound detectably fast. Surprisingly for a d.c. servo motor, there is no provision for speed adjustment, externally or internally, so the LBT-188WA is not for pitch-sensitive listeners.

Change of speed (wander about nominal) was low, resulting in a low DIN weighted Wow & Flutter value of 0.1%. There was little Flutter too, resulting in a low 0.08% Wow&Flutter figure (DIN wtd). So our sample was speed stable but ran fast.

The arm tube had a main bending mode at 350Hz our analysis of vibration with a Bruel&Kjaer accelerometer on the head shell shows. This is a high value, due to light weight cartridge/headshell assembly, and light stiff tube. There was some high frequency disturbance too. With a narrow peak however there's little energy here – a good result for a simple, budget arm.

Gain in the phono stage was low at x57 (35dB) like all Chinese sourced turntables and overload fairly low too at 30mV in and 1.7V out, at which level

distortion was high at 1.2%. However, equalisation was accurate, resulting in flat frequency response – but where these OEM stages usually have a warp filter this one does not.

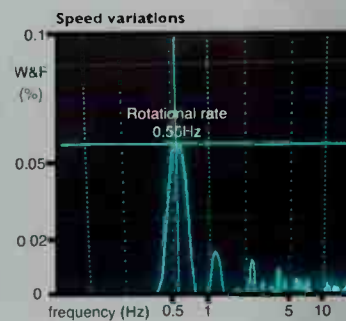
With two digital outputs, USB and Bluetooth, there is an on-board Analogue-to-Digital Converter (ADC). Frequency response was flat and maximum record level set low to 10mV from the cartridge to maximise dynamic range from the 16bit ADC so occasional peak distortion may be heard from LPs cut at high level. Even though noise (IEC A ltd) measured a low (for a budget 16bit ADC) -86dB with shorted input (i.e. no signal) in practice signals below -50dB were barely resolved, because of quantisation noise generated by the presence of a signal. Bluetooth gave the same result.

A good if not perfect set of results, speed being fast and the ADC of low resolution. NK

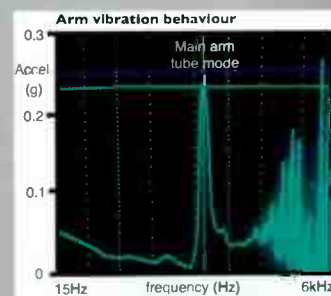
### TURNTABLE

Speed error	+ 1.3%
Wow	0.1%
Flutter	0.05%
Wow & Flutter (DIN wtd.)	0.08%

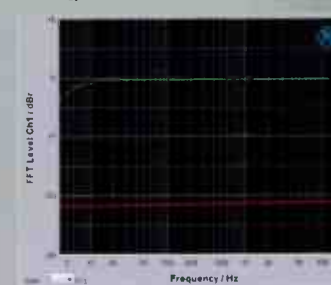
## SPEED VARIATIONS (W&F)



## ARM VIBRATION



## FREQUENCY RESPONSE



**LENCO LBT-188WA**  
£220



**EXCELLENT** - extremely capable.

**VALUE** - keenly priced.

### VERDICT

Good analogue performance but poor digital sound.

### FOR

- stable speed
- good MM cartridge
- easy to use

### AGAINST

- runs slightly fast
- no speed adjustment
- poor digital quality

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# Old Dreams And Time Machines

Heavy on the nostalgia, Paul Rigby looks at books devoted to David Bowie, Colosseum's Jon Hiseman and Pink Floyd.

## DAVID BOWIE

Let's get this out of the way first: this is a big book, spanning 36 x 26cm (14 x 10in). The large format allows Rock's images to come to life. You can also zoom in and examine each area of any one photograph.

This book is not merely a collection of large-format plates. The design moves from one large image to a mosaic of smaller photographs, arranged, sized and framed in a variety of ways that keeps the interest as you turn the page. Of greater interest are the notes from Bowie himself who offers a wealth of extended annotations.

For example, Bowie performed an eagle mime at a Summer 1973, which is illustrated here. He remembered performing the same mime in 1968 at a T.Rex show. An allegory of the Chinese invasion of Tibet, word got out that he would be performing the mime upon which a hoard of Maoists turned up at the concert and waved their little red books at him. Marc Bolan thought the whole thing was wonderful while Bowie trembled with anger. A brilliant book.

## JON HISEMAN

This is an album-by-album type of book. Nothing new, eh? This one feels different. You can read the extra effort. For example, Hanson's multiple 'Digressions' which add flavour and context to any one point in Hiseman's career. So you might read of a concert experience or the behind-the-scenes insight of the recording of a particular studio album.

These editorial elements prevent the book becoming a box-ticking exercise. They add soul, if you will.

Another difference is the man himself and his varied career. So Hiseman's album-by-album run down also reflects the many groups he's been associated with. This collection is a jazz fusion history of a sorts because we dip into the life and

times of John Mayall, Mike Taylor Quartet, Graham Bond Organisation, Colosseum, Howard Riley Trio and on and on.

There's plenty of quotes here, a host of photographs, newspaper clippings, itineraries, sleeve art and more.

This is a quality piece of work. It's highly recommended for Hiseman fans.

## PINK FLOYD

Offered in a square page format (ideal for what's inside), the book focuses on 10 famously poor quality BBC recordings and then dives deep into each.

Priston's mission was to search for better quality sources of each session that were available (not all of them were or are...yet). And he did it too. The new cuts are apparently superior to anything the band itself owns.

Each session "inventory" features a tracklisting, who introduced it, line up, running time, detective work in tracking down the tapes or (when the session is absent) information pertaining to them, when the session was supposed to start, when it actually started, background to the figures involved including the DJs, quotes from the same, the arrangement set up, catalogue information, images of notebooks, newspaper clippings, master tape images, acetates, transcription of the DJ chatter, how the session music may have changed or was edited over the years, information on various copies of the original masters if applicable, home-taped copy information. And so it goes.

Obviously a work of love, this book is packed with information. It reads like a detective diary. Like the notes from a private eye, on the case to track down these works.

This is a stunning book. Dedicated Floyd fans need this.

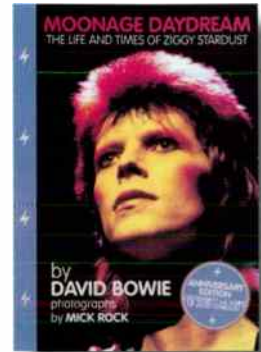
**Title:** Moonage Daydream: The Life and Times of Ziggy Stardust

**Authors:** David Bowie (Photographs by Mick Rock)

**Publisher:** Genesis

**Price:** £49.95

**Pages:** 328



**Title:** Jon Hiseman's Journey in The Time Machine: Album by Album

**Author:** Martyn Hanson

**Publisher:** Temple Music

**Price:** £23.99

**Pages:** 277

**Contact:** jonhiseman.com



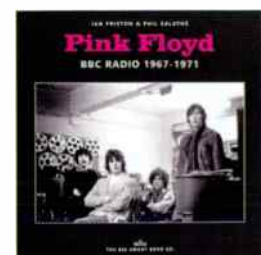
**Title:** Pink Floyd: BBC Radio 1967-1971

**Authors:** Ian Priston & Phil Salathé

**Publisher:** The Bee Smart Book Co.

**Price:** £44.90 (hardback) or £34.90 (paperback)

**Pages:** 240





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AUDIO NOTE Lexus RCA phono cables, original box, £95. Nakamichi Reference Recording cassette Sheffield Labs tape - Thelma Houston, £100. Nakamichi Azimuth and cleaning kits (needs Isopropyl) £55. Tel: Steve 07985 975 546

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MUSICAL FIDELITY amp John Sampson upgraded (£1,400) P270 power to phenomenal "P470". Pictures available Speed, grip, musicality, comparable amps £2k + Asking £1,850. Downsizing sale Please contact Tom 07809 554 827 (West Yorks)

PRIMARE i30 amp. Black, boxed with remote £650. Tel: Bill 02084 649 055 or Email: [billmilla@virginmedia.com](mailto:billmilla@virginmedia.com) (Bromley)

CHORD SIGNATURE ARAY 1.5m mains cable, hardly used, as new and boxed £330. 2no sets Naim cups and balls with 2no 455x345x10mm grey toughened glass £65 Tel: 07785 733 202 (Chichester, Sussex)

ORTOFON 2M Blue cartridge. Boxed. Excellent condition. About 30 hours use. £120 ono. Tel: 07894 988 879 or Email: [andy@shearer1.com](mailto:andy@shearer1.com)

SOUND STYLE Hi-Fi/TV tables (2) rectangular, 3 shelves, black steel, black glass. Hold up to 6 units or 1 TV, 4 units. £40 each. Email: [walcherry@yahoo.co.uk](mailto:walcherry@yahoo.co.uk) (Ross on Wye)

REGA ELEX-R amp. 1 year old. All packaging remote etc. As new condition. £625. Collection only from Slough. Tel: 07398 642 586 or Email: [johnakeanelangley@gmail.com](mailto:johnakeanelangley@gmail.com)

WANTED: LECSON Lynette LBI speakers in any condition. Have been looking for ages. Tel: Alex 07939 116 779

WILSON DUETTE II speakers & stands. Obsidian Black. All accessories, instructions etc. Condition as new. Little used. £10,5k (RRP £26k). Can demonstrate. Tel: 07704145987 (AM only). Email: [norbertstefan@yahoo.co.uk](mailto:norbertstefan@yahoo.co.uk)

SONY TC-K61 IS Dolby B.C.S 3 head, very light use, owned from new Excellent condition £150. Sony ST-SA 3 ES high end RDS tuner FM-AM Tuner very light use. £100 Both black. Pickup, Milton Keynes. Email: [terrypaulaok@hotmail.co.uk](mailto:terrypaulaok@hotmail.co.uk)

MUSICAL FIDELITY Series X-A1 integrated amplifier. 50 watts per channel. Mint condition. Boxed. £375 Ono. Tel: 07505 057 414. (London, Camden, Hampstead)

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MICHELL ORBE SE turntable, black with Rega armboard. QC power supply. Excellent condition, owned from new, fully boxed with receipt, £2,100 Tel: 07890 705 236 (Norfolk)

TOWNSHEND ALLEGRI Reference Passive Pre amplifier black with remote. Original case. £6900 ono. Marantz SA-K1 Ruby CD Player SACD Black. Mint, original packaging. £2900 ono. Tel: George 07539 070 748 or Email: [g\\_astill@hotmail.co.uk](mailto:g_astill@hotmail.co.uk) (Leicester)

RUSS ANDREWS Torlyte base and shelf unit. In excellent condition, total height 439mm. £370 inc. P&P. Tel: Graham 07815295227 (Durham)

WANTED: Top quality HiFi separates and complete systems, Naim, Linn, Cyrus, PMC, Audio Research etc. fast, friendly response and willing to travel/pay cash. Please call me on 07815 892 458 or Email me at [pogsonp@aol.com](mailto:pogsonp@aol.com)

WANTED: TECHNICS RS-1500 tape recorder with remote, service manual and instruction book. Also Uher SG-631 tape recorder. Tel: 01902 870 605



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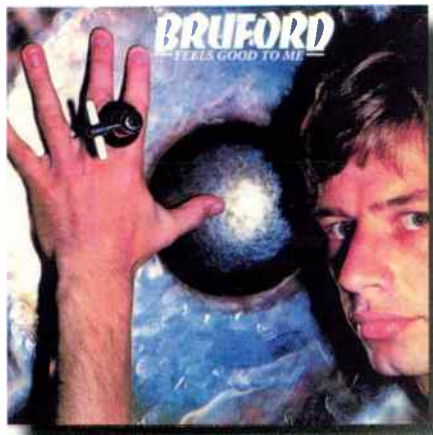
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## BILL BRUFORD

## FEELS GOOD TO ME

POLYDOR



Bruford is enjoying himself. He loves' jazz immediacy and its fleet of foot.

**A**rguably one of the best drummers of all time (there is plenty of competition out there, I know), part of the genius of Bill Bruford sits within his flexibility.

He is genuinely famous for his time both in the prog outfit Yes and also King Crimson. He worked with Genesis too for a time. But Bruford has also forged another career as a jazz fusion creator and it's the latter I want to address with this album 'Feels Good to Me', his 1978 solo debut, created right after he had left the King Crimson drum stool for the first time.

And that move from prog rock to jazz, is worth considering for a moment because both musical genres represented two different worlds in terms of grandeur and money and fame and structure and – well – staff.

You realise that Bruford loves his jazz and he must have done so want to live in and from it. At the time of the release of this album, he was married with a young family so things like that mattered.

Both in artistic but also business terms, the move to jazz was like moving to another world. According to Bill Bruford himself "I was headed towards jazz which, on the whole, doesn't have managers. It's a high-end cottage industry rather than mass market. It's Jaguar to General Motors. In the absence of volume sales it looks to niche market and to cut costs - and 20% of your gross income to pay for a manager really is a major cost, especially when the expenditure is only putting another tier of bureaucracy between you and the customer".

The above was also indicative of the time. When this album was released, the earlier innocence of popular music was beginning to give way into more accountancy-lead music careers.

So you have a changing music business culture, you have Bruford's changing personal circumstances and you have his change of music style and genre. In short, this release was a big step. It was not a casual, throwaway. It wasn't something to fill in an afternoon and then back in the prog chair the next day.

This album has a certain Canterbury feel to it with the addition of one of the best guitarists of all time, Allan Holdsworth (Soft

Machine and Tony Williams' Lifetime), John Goodsall from Brand X, bassist Jeff Berlin, Dave Stewart on keys plus flügelhorn legend Kenny Wheeler. Then there was the addition of avant poet, singer, and songwriter Annette Peacock. It was quite a line up.

And that line up hits the ground running on the opener 'Beelzebub' with its Zappa-like staccato introduction and complex time signatures. Holdsworth joining in with that and then spreading his wings to indulge in rhythm adventures of his own.

Peacock adds a smoothing, rather alluring tone to her delivery but this band is so good it often threatens to swamp her performance so you find that she hangs on in there at times.

The balladic first part of Seems Life a Lifetime Ago allows Peacock to control the direction of the song but, in Part 2, the band are off again, full pelt. Bruford's light touch combined with his easy complexity, his willingness to insert delicate rhythms where delicate rhythms possibly have no right to be, gives the music a rich and fulfilling presentation.

And so it goes. And you know what? Listening to this album, I get the feeling that Bruford is enjoying himself. Listening to the man, I'm sure of it. He loves' jazz immediacy and its fleet of foot.

"Part of the reason I was edging towards jazz was because there had to be better ways creating music than by staring at your fetid: a room full of expensively unprepared musicians - one of my least favourite pastimes".

What he means by that is this. By the time the prog band Yes had decided what day of the week it was, his jazz outfit would have considered, rejected and deployed enough music for two albums and a BBC session. They were different worlds.

This one? This world? I'm sure you'll enjoy.

You can enjoy even more via a newly released BMG box set spanning Bruford's entire prog and jazz-based career called, 'Making a Song and Dance: A Couple Career Collection' covering six CDs and including his jazz work plus moments with Yes, King Crimson, Roy Harper, Chris Squire, Steve Howe, Buddy Rich, David Torn and more. **PR**

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