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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.

Big loud speakers able to shake a building don't come cheap. One of the most memorable reviewed by us recently (Dec 21 issue) was JBL's HDI-3600, an imposing floorstander with thunderous bass yet a price tag of £3199. That's well below so many others with similar pretensions. But in this issue we have for your delectation the Acoustic Energy AE320 - a floorstander that similarly packs a powerful punch low down. If you dream of seismic lows that move the body it could be the one, the speaker of your dreams - price just £1599. Don't miss reading about it on p11.

Another classic British product that appears in this issue is Exposure's new 3510 amplifier. Very deliberately a honed update of the way it was done long ago, it uses well developed circuitry in Class A/B output configuration, equipped with modern transistors. The result is low distortion and excellent load tolerance, unlike that of Class D amplifiers. Add in a huge linear power supply and the end result is worth hearing thanks Martin Pipe, as he explains on p18.

Yet another great British brand - Naim - also appear in this issue. You can find them on p66 where we look at their Uniti Atom HE streamer/headphone amplifier. With numerous balanced headphone outputs this is for headphone aficionados that want a smooth Naim sound from the internet or from their own home-network sources, not forgetting Bluetooth from the 'phone. The HE is a different way of doing things.

Lenco's budget LS-55 turntable seems to offer it all from the vinyl LP, including digital recording to a flash-drive, replay from that drive and Bluetooth output. But with all this costing just £135 there were drawbacks we found. Read about them on p73 to find out why a turntable like this is not the bargain it appears.

I hope you enjoyed Christmas and wish you Happy New Year, but sadly the magazine and I won't be at February's Bristol Show in sunny 2022 because it has just been cancelled due to the accrued bug. Better luck in 2023 perhaps!

Noel Keywood
Editor
New affordable floorstanders with deep bass and a fast sound impress Noel Keywood.

Hi-tech stand-mounting loudspeakers with K2 sandwich construction cones get Noel Keywood’s attention.

Martin Pipe checks out an interesting digital headphone amplifier from Naim that’s also a streamer.

Exposure release a classic analogue hi-fi amplifier. Martin Pipe enjoys its sound.

New affordable floorstanders with deep bass and a fast sound impress Noel Keywood.
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In the early days CD players were expensive. Martin Pipe checks out Hitachi’s budget alternative from the 1980s.

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THE REFERENCE
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Hand-built by KEF’s master craftsman in the UK, the Reference embodies KEF’s history, heritage, philosophy and singular need to be the benchmark of sound reproduction.

Listen and believe
TAPE-TO-DISC TRANSFER
Whenever Nagra is mentioned, you’ll think of beautiful Swiss tape recorders. Many years on, and these exceptionally constructed machines are prized by analogue audiophiles. Nagra still makes professional recording devices, albeit digital ones, and “security devices...for law-enforcement and official government agencies”. Since 1997, though, high-end hi-fi has accounted for an increasing slice of its business. To celebrate 70 years since the arrival of its first product, a hand-cranked portable tape recorder, Nagra has launched its $175k Reference Anniversary Turntable. This substantial yet precise disc-spinner, built from aerospace materials and belt-driven from two quartz-referenced brushless DC motors, is pre-fitted with a carbon-fibre tonearm. Both, Nagra explains, were “designed from the ‘ground up’ to work together as a system”. For many, say Nagra, said system will be “proudly passed down from generation to generation - like many Nagra III tape recorders”. You’d better move fast, though, as only 70 will be made.

Further details: Nagra, bit.ly/3GbyKqP

LITTLE DENMARK
Billed as Copland’s new ‘entry-level’ integrated amp the £2,988 CSA70 is, unlike its CSA100 and CSA150 brethren, a purely solid-state affair. The Danish company does however tell us that the CSA70’s power amp section (2x70W into 8 Ohms) shares the same circuit topology of the two costlier models. To cover as many bases as possible the distinctively-Copland CSA70, billed as the ‘little’ integrated, includes MM phono input, three line-level analogue inputs, a Wolfson-based DAC that can be fed from four independently-selected digital inputs (one USB, one coaxial and two optical) and provision for headphones. Support for aptX HD Bluetooth, the fifth digital input, is optional. The 13kg CSA70, said to take awkward dynamic loads in its stride, also boasts the shortest possible internal signal paths, remote control (the volume knob is motorised), heavy-duty speaker terminals and preamp outputs both fixed and volume-controlled. Black and silver CSA70s are available.

Further details: Absolute Sounds, bit.ly/3lv3ueq

B&W PLAYS THE MIDNIGHT BLUES
For some time, Bowers and Wilkins has offered its iconic Nautilus flagship in a ‘midnight blue’ colour scheme. The latter has now filtered down to the more affordable 700 Series, two models of which have been given this striking metallic treatment. These are ‘Signature’ versions of the Nautilus-inspired 705 two-way standmount (£3,000) and 702 three-way floorstander (£5,500), both of which feature proprietary B&W Aerofoil-profile woofers and top-mounted (anyone remember the DM7?) ‘Carbon Dome’ tweeters. The three woofers of the larger 702 are augmented by a decoupled Continuum-coned FST midrange driver. B&W’s finishing process involves applying seven coats of metallic-finish paint and lacquer to produce a “rich, lustrous finish”. Furthermore, a ‘Signature’ identity plate is fitted to the rear panel.

Further details: Bowers and Wilkins, bit.ly/3GbyKqP
AUDIOLAB GOES OMNIA-DIRECTIONAL
To its £1,599 Omnia, described by maker Audiolab as an “all-comprising audio solution”, the purchaser need add only speakers. Unlike many all-in-ones, the Omnia has a built-in CD player. Based on the 6000CDT’s transport, this is claimed to yield music from scratched CDs that lesser hardware would reject.

The Room Ready Omnia handles hi-res network playback via Ethernet or Wi-Fi, thanks to the app-controlled DTS Play-Fi platform. Streamed audio, computer USB, mass-storage USB, Bluetooth 5.0 or coaxial/optical digital sources are converted into analogue by a MQA/DSD-compatible DAC based on ESS9038 Reference chippery. These, or your choice of analogue sources (there are three line-level inputs, plus MM phono) drive speakers via the Omnia’s discrete 50W power amplifiers. However, a headphone socket is also included for personal listening.

There’s no conventional tuner but the Omnia supports Internet radio, as well as a multiplicity of streaming services including Spotify, TIDAL and Qobuz.
Further details: Audiolab, bit.ly/3CG3LYG

SHADOW AND LIGHT
Astell&Kern’s latest is the £449 Acro BE100, a ‘house-styled’ Bluetooth speaker. The angled shapes of the mesh speaker grille are “influenced by the reflective interplay of shadow and light”, A&K tell us - and top-mounted volume knob will be familiar to anyone with previous experience of its products.

Clad in faux leather, the BE100’s ported wooden cabinet hosts a 3.5mm analogue input that can provide an alternative to the 24-bit aptX HD/LDAC-ready Bluetooth 5.0 connectivity.

Behind the grille lurk a 4in. Kevlar-coned mid-bass driver and 1.5in. silk-dome tweeters, which allow the BE100 to reproduce stereo audio. They are powered by 55W of Class-D amplification, driven in turn by a ‘digital crossover’ and dedicated ‘hi-fi grade’ 32-bit DACs. Also onboard are dynamic-range control for speaker protection, a low-jitter clock for the digital circuitry, bass/treble tone controls and status indication via volume-control backlighting. You can choose between black and white finishes.
Further details: Astell&Kern, bit.ly/3h6ywY

MEZE WAXES LIRICAL
No stranger to these places, Romanian transducer specialist Meze Audio has launched the £1,899 Liric, its first closed-back planar-magnetic headphones “for listening in and outside the home”.

A ‘portable planar’ has long been in the sights of the firm’s founder, Antonio Meze. Marking a third collaboration with Rinaro Isodynamics, the Liric (Romanian for ‘Lyrical’) is based on a scaled-down version of Rino’s ‘Isodynamic Hybrid Array’ driver. This features Phass-X™ technology, claimed by Rinaro to minimise the phase non-linearity issues that allegedly plague closed-back designs.

The improvements to spatial imaging are, we’re told, particularly noticeable with binaural recordings. Meze has partnered two of these 30 Ohm drivers with its ergonomic framework and circumaural ovoid earcups, which are implemented using materials like fibreglass-reinforced polymer, high-grade magnesium, leather and aluminium. According to Meze the 31g Liric will deliver a “similar audio experience... to (its) Empyrean”, a fine open-back model that also features Rinaro drivers.
Further details: SCV (UK distributor), bit.ly/32I1eLO

FULL STEAM AHEAD!
You’ve had to wait three years for it, but there’s now a matching preamplifier for designer Dan D’Agostino’s £125k-a-pop Relentless monoblocks – oddly steampunk-influenced designs that each weigh a quarter-ton, and pump out 1.5kW. The £165k Relentless Preamplifier comprises three vertically-stacked chassis. Between the central enclosure that contains the controls and line-conditioned power supply (separate 150VA transformers for analogue audio, and everything else) are individual chassis for the feedback-free circuitry of each audio channel.

The latter features a “completely-unique” temperature-stabilised discrete-FET input stage with >1 Megohm input impedance and can handle 30V signals without clipping. Other features include distinctive Bluetooth remote, five relay-switched balanced-only inputs, 2-source/2-zone support, home-cinema
**FOR YOUR REFERENCE**

New from Grado Labs are the Reference Series RS1x (£800) and RS2x (£600) open-back dynamic headphones which, as the suffix suggests, feature the Brooklyn firm’s fourth-generation ‘X’ drivers. Those of the RS1x are of 50mm diameter, and built into wooden cups consisting of a maple sleeve, hemp core, and corohol outer ring.

The RS2x, meanwhile, features 44mm drivers and housings made of maple and hemp wood. Grado appreciates wood for its “warm and embracing tonal abilities”, but the RS1x and RS2x are its first headphones to be built around the latest ‘X’ driver - which, relative to its predecessor, is claimed to offer increased magnetic power, a voice-coil of lower effective mass and a ‘reconfigured’ diaphragm. Both hand-built models feature 99 9dB (1mW) SPL, 38 Ohm impedance, ‘L Cushion’ earpads, white-stitched leather headbands, and 8-conductor cables (terminated in unbalanced 3.5mm plugs). Left and right drivers are matched to within 0.05dB.

Further details: Grado Labs, bit.ly/31nUdxS

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**IT’S ALL GREEK TO ME...**

There’s now a more affordable alternative to Athens-based Lab 12’s £3,295 melto2 phono preamp. To meet a lower price point, the £1995 melto1 loses the menu-driven sophistication, input selector and balanced connectivity of its bigger brother. It is nevertheless, like the melto2, a “no-compromise” valve-based design that can accommodate MM or MC cartridges. Inside, you’ll find feedback-free circuitry based around four carefully-matched NOS (‘new old stock’) double-triodes, for “more natural... analogue sound”. On the rear panel are DIP switches, one row per channel, that configure the input stage’s impedance (32 ohms to 100 kilohm) and provide capacitive loading of up to 300pF. Not as easy as ‘dialling in’ settings, but how often do you change cartridges? Other features include balanced PCB topology, separate grounding paths and toroidal mains transformer. The melto2 is said to be capable of a “well-balanced 3D sound stage with wide frequency response, giving you pure, musical realism”.

Further details: MCRU (UK distributor), bit.ly/3re4VS9

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**TWO INTO ONE WILL GO**

With trademark hip-flask styling, iFi’s latest xDSD Gryphon DAC/headphone amp builds on the performance and features of 2018’s xDSD, by adding to its repertoire the analogue inputs and balanced headphone drive of the similar-vintage xCan. Hence that allusion to the mythical eaglerion hybrid.

Described as “high-end audio you can take wherever you go”, the £599 device features a hi-res Burr-Brown D/A chip that’s compatible with single/double-speed DXD and PCM, DSD formats following a different signal path. USB, S/PDIF and hi-res Bluetooth digital inputs arrive at the DAC via an XMOS processing chip.

Your headphones, balanced or unbalanced, are driven by iFi’s proprietary ‘PureWave’ amplification, which is claimed to deliver 1W into 32 ohms. A top-mounted LED strip reveals information like volume, battery condition and incoming signal format. Other features include MQA support, selectable digital filters, 215g weight, a Qualcomm Bluetooth 5.1 engine, bass-boost for open headphones and 8-hour battery life.

Further details: iFi, bit.ly/3dcDArl

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bypass and precision volume control. There’s no phono stage, but an optional (and as-yet-unpriced) streaming module is expected soon. With appropriate sources and speakers, we’re probably looking at a £1m hi-fi system! However, at over £400k for a complete kit the Arizona-built Relentless isn’t the world’s most expensive amplifier. Those honours go to the $2m 1.8-ton 120kW (!) Opera Only, by Italy’s Andrea Pivotta.

Further details: Absolute Sounds, bit.ly/3v3tueg
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Go Low

Acoustic Energy’s new AE320 floorstander digs deep finds Noel Keywood.

Acoustic Energy have an audience, a long standing fan base that includes me. Their efforts to combine excitement with fundamental accuracy rightly has followers – and the new AE320 floor stander I’m reviewing here won’t frighten them away, especially at a price of £1599 (UK).

Tall and slim, the AE320 has been designed, they say, to appeal to overseas buyers demanding more volume to fill big rooms – one reason for multiple drivers. This is a floor stander rated to take 200 Watt amplifiers and, with a high sensitivity of 88dB (loud) from one Watt, it does not need such power in any case. But there you are – a sort-of mission statement. A loudspeaker able to go loud, “suitable for medium to large rooms” they say. Think 15ft long up to 25ft long.

Not blessed with an absence of neighbours, I got up to high volume for short periods only, spending most time at medium to loud.

For a clean, fast sound the AE320 uses three of the company’s ceramic/aluminium sandwich 130mm (5in) cone drive
Every note. Every word. Every detail.

Mu3 noise cancelling true wireless earphones
Sound by KEF. Design by Ross Lovegrove.

We are purists at heart, at KEF, we believe in natural, accurate sound. The Mu3 earphones are the next evolution in that quest. Designed by Ross Lovegrove – pioneer in design and ongoing KEF collaborator - sculptural beauty and engineering excellence come together for audio that’s brimming with life in all its astonishing complexity. Old favourites, new tunes, underrated or overplayed, this is music as it was meant to be heard.

Listen and believe
The 28mm aluminium dome tweeter is larger than most (25mm) and is aided by a shallow waveguide to give smooth output up to 20kHz.

Good dispersion. The bottom two drivers act as extended bass units working up to 250Hz, the next up is a midrange unit that contributes to bass (slow roll-off). It works up to 3kHz before handing over to the large 28mm aluminium dome tweeter that sits in a shallow depression that acts as a waveguide, reaching up to 18kHz.

The midrange unit sits in its own closed chamber, whose walls act to stiffen the cabinet Acoustic Energy point out. The two bass units are loaded by a rear chamber vented by a slot port that our measurements showed gave strong low bass—an important feature within this 'speaker's sonic make-up.

The base is weighted by sand in a sealed chamber, making the cabinets heavy at 26kgs; spikes are supplied. Dimensions are 1m high, 175mm wide and 320mm deep and mono-wire terminals are fitted, so no bi-wiring. Finishes are Black, White or Walnut real veneer.

**Sound Quality**

The AE320s were run in, even though they had seen use as early demo samples. Drive amplifier was initially a PrimaLuna Evo 300 Hybrid connected by Chord Company Signature Reference screened cables, but I moved on to our Icon Audio Stereolab SE that was a better match. Delivering music into the amplifier was our Oppo BDP-205D acting as a CD player, used for its ESS ES9038Pro DAC driven by a linear power supply, giving top sound quality from silver disc.

Hi-res came from a MacBook Pro running Audirvana+ software player to handle PCM and DSD, sending it via USB (DoP) to the Oppo’s USB input.

As an overview, the AE3020s were as clear, projective but naturally balanced and smooth as I had expected, knowing what Acoustic Energy aim for. What took me by surprise — sort-of — was the presence of obvious low bass. I say “sort-of” because measurement had suggested a lively presence from strong port output. But what to expect subjectively? Here goes.

I wasn’t aware that Antonio Forcione’s Tears of Joy (CD), a close-miked acoustic guitar piece, had any low frequency content so was surprised to hear obvious lows coming from this recording, what sounded like a synth backing track adding in sporadic drone; it was low and powerful in my 17ft long room. Lifted from the mix to become obvious.

There was a reason: my room’s main (length) mode at 33Hz co-incided with this 'speaker’s port output at 35Hz. For most of the time I heard lively lows as a result, being surprised at just how many tracks had info in this region. There were tracks where the port became overwhelming, notable being Loreena McKennit’s Gates of Istanbul (CD) where sustained deep bass notes were too strong. They would have been less obvious in smaller (14ft) or bigger (>20ft) rooms than mine. This is a room matching issue, raised by a port with strong output where room gain occurs. The simple solution was to put acoustic foam into the ports, just a small amount had a big effect I found. Half an old (wooly) sock would do.

As delivered the AE320’s port will give strong low bass, making for a powerful sound. These are not bass-light ‘speakers, yet upper bass was quite dry in nature, so think — not a fulsome sound yet with strong deep bass. This would please most listeners I believe.

Moving up the audio band, vocals were projected well, without the over-emphasis a raised upper midband can bring. One of those acoustic tricks some designers like to use. Acoustic...
Every note. Every word. Every detail.

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*KEF 60 Years*
they greatly thoroughly AE320s various warmth, company making in sporadic sound. handle sound. consistency an wich Three the way the boxiness drive way that her dumpped, a silky smoothness. It gives less damped, leveller bass. Overall impedance was high at 8.4 Ohms making the speaker a light load in terms of current draw, and this can be seen in the impedance trace as height above the x-axis. All the same, voltage sensitivity was good, 88dB being delivered from one nominal Watt (2.8V) of input. That's loud, making amplifiers down to 40 Watts sufficient for very high volume.

The AE320 follows Acoustic Energy's design approach of producing a fast yet accurate sound. With fine results all round the AE320 will perform well in use, with powerful subsonics.

**MEASURED PERFORMANCE**

Frequency response of the AE320 stretches from a low 30Hz up to 20kHz our third-octave analysis of pink noise shows. Other measurements made clear the forward response rolls down slowly and smoothly below 200Hz to -2dB at 100Hz and -6dB at 55Hz, a characteristic suitable for near wall use. The port has very strong output at 35Hz, providing strong subsonics, especially with Rock where lows in the 30Hz region exist – not uncommon with synthesisers. So dry controlled bass, but with a big low-end kick. There's no plateau treble lift for artificial enhancement, the tweeter working smoothly to 18kHz except for a small peak at 10kHz. The drive unit immediately below the tweeter covers the midrange and some bass, whilst the two lower units identically cover all lows up to 250Hz, acting in effect as wide range bass units. They are loaded by a slot port at rear. It's resonant, making the speaker a reactive load, rather than resistive. It gives less damped, leveller bass.

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"There was a fine sense of scale here, brass sections rasped out strongly and kettle drum thundered"
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WIN

Here’s your chance to win either a Zen Can or Zen Phono from iFi, one item per winner for two winners. State your preference on entry. Read a review excerpt below and answer the questions.

“In brief outline, Zen Phono is able to cope with all cartridges, from budget moving magnet (MM) types through to the lowest output moving coil (MC) types. A small slide switch at rear has four positions, numbered 1, 2, 3, 4. Logically (to an electronics engineer) position 1 offers lowest gain and is intended for MM cartridges. Position 2 offers more gain and is for high output MC cartridges purpos ed for MM inputs. Then comes position 3 that iFi say is for “low output” MCs, although to my mind this is for standard MCs, all of which have low output. And finally there is position 4 to cater for “very low output MCs” as iFi put it.

This range covers all cartridges on the market, position 4 being unusual for a phono stage at the price. Very low output MCs are esoteric and usually expensive. It’s common to pay ten times the Zen’s asking price for a stage with sufficient gain to cope with a very low output MC, so that’s a plus point straight away. Zen was spectacularly – almost unbelievably – quiet via its ‘low output MC’ and ‘very low output MC’ inputs. I had to double check the measurements.

Internally iFi say the Zen is fully balanced on each channel, not difficult with ICs yet uncommon practice. Running fully balanced cancels noise and distortion and – I find – in general gives a more pristine, if sometimes surgically correct sound. But the nice point here is that iFi provide a balanced output to exploit this and, they say, it is “the recommended output”. The Zen develops a signal twice as strong from its balanced output than from the RCA phono socket outputs and more than enough to transmit audio down a long line from turntable to distant amplifier”.

For a chance to win this great prize, just answer the four easy questions at right. Send your entries on a postcard only, by 4th February 2022 to:

February 2022 Competition,
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QUESTIONS
[1] The rear slide switch has:
[a] four positions
[b] an electric motor
[c] rubbery bearings
[d] LED lighting

[2] Position 4 is:
[a] not there
[b] for Bluetooth
[c] “unusual”
[d] redundant

[3] Zen was:
[a] gold plated
[b] jet powered
[c] thermionic
[d] “spectacularly quiet”

[4] The balanced output was:
[a] twice that of phono
[b] same as phono
[c] meagre
[d] lethal

RULES AND CONDITIONS OF ENTRY
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November 2021 Winner: Black Rhodium Waltz S Loudspeaker Cables
Mr. Richard Lockwood of Hulme, Manchester
Past Power

Exposure’s 3510 integrated proves, to Martin Pipe, that transistorised amplification remains supremely relevant today.

As supplied, the £2,250 Exposure 3510 integrated featured here seems to take us back in time a decade or three — and that’s no bad thing. In terms of signal-processing, the West Sussex-based manufacturer has followed in the direction it started in 1974 and knows very well. Classic analogue solid-state circuitry is used throughout, the power amplifier being a time-honoured Class A/B design rather than one of those ‘fashionable’ Class D switching types. The review sample wasn’t equipped with a DAC or Bluetooth facilities, our 3510’s only digital circuitry being the microprocessor that looks after input switching and the motorised (i.e. remote-controllable) ALPS volume pot. This no-nonsense – but nevertheless attractive, in its black or titanium finish – amplifier is part of a range that includes a preamp, plus mono and stereo power amps. Splash out another £300 for an internally fitted phono stage or £410 for DAC alternative. Compatible with coaxial or USB (computer)
sources, this supports hi-res PCM and DSD but not Bluetooth. The 3510’s only front-panel socket is a 1/4in (6.3mm) headphone jack that, as per tradition, automatically mutes the ‘speakers when a plug is inserted.

You can’t have both DAC and phono board inside an amp, but whatever you choose to have fitted is selected as the first input – in addition to this are three unbalanced line-level inputs for conventional sources. If neither option is installed, the sockets – high-quality gold-plated RCA phono types, like the others present on the 3510’s rear panel – becomes a fifth line input. LEDs confirm input selection, which is by front-panel knob or the remote. A fifth input, marked ‘AV’, that when selected bypasses the 3510’s volume pot. There are also Tape inputs and outputs.

To avoid potentially disastrous feedback problems, the latter are sensibly muted whenever the tape input is selected. It’s a shame that amplifier manufacturers no longer offer a proper monitor ‘loop’, with controls that divert listening from the source to the tape in sockets. Exposure’s designer Tony Brady told me that “there is no call...I can’t remember the last time someone asked for it”.

A peek inside the 3510 reveals an exceptionally-high standard of internal construction – as befits price. Two pairs of output transistors, mounted on a mid-section heatsink, are used for each power-amplifier channel. A hefty toroidal mains transformer is the 3510’s largest and heaviest single component. Connections to the chassis-mounted rear sockets are made by wire – a hand-assembly job. It’s better than board-mount connectors that suit machine assembly.

**SOUND QUALITY**
Most of my listening was done using a Cambridge Edge...
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streamer as a streaming-radio and networked playback source, the amplified result being fed to a pair of Quadral Aural Wotan VIII speakers (a good price match). Headphone (Focal Utopia) listening was also tried, as was vinyl courtesy of a Technics SL 1200 Mk3 and AT440MLb MM cartridge; a Pro-ject Phono Box S2 was used to convert the latter’s signals into a form that could drive the 3510’s line input.

In many respects, the presentation is not dissimilar to that of the smaller XM5 model I reviewed four years ago. The vocals of the music I played – whether those of Leonard Cohen, Beth Gibbons, Thom Yorke or Hannah Reid – were given presence, detail and intimacy. I was hooked on every word, every breath, every nuance. I found that guitars, whether acoustic or amplified, conveyed well. Rory Gallagher’s searing Strat, as captured on the MFSL CD (FLAC rip) of his Irish Tour ’74 – the year Exposure was born – effortlessly convolved with power and atmosphere.

Also noteworthy is the 3510’s performance in the lower octaves. It sounded clean and its tautness was maintained, even at the higher listening levels that suit Irish Tour ’74. Clearly, the power at its disposal is of benefit here. The impact of the audience footstomps on the Gallagher album (alongside the odd buzz or two!) maintain the live atmosphere, helping to release the excitement and energy of those long-distance gigs into my room.

Meanwhile another Fender guitar, specifically the bass of Ohio Players’ Heaven Must Be Like This (Skin Tight from... err, 1974, FLAC CD rip), was bestowed with a delicious analogue warmth that’s almost valve-like: I could revel in Marshall Jones’s playing without losing sight of the overall musical picture. A more recent track, London Grammar’s Hey Now (If You Wait, FLAC CD rip), demonstrates this amplifier’s ability to reach satisfyingly deep in terms of bassline – this track is a demo fave for a good reason!

This remote’s ‘mute’ function is relay-driven, for faster response than winding down the motorised volume control. Unfortunately, the remote cannot switch the amp into or out of standby – although it did interact with my Cambridge Edge streamer!
Leveraging a 1” aluminium tweeter mated to Klipsch’s proprietary Tractrix horn-loaded technology - the R-51M bookshelf speaker delivers incredible acoustics to fill your home with loud, crystal-clear sound and robust bass like no other ordinary bookshelf speaker can.

* Shown with R-100SW Subwoofer
Plenty of connectivity here, with no fewer than six line inputs - the first of which can be fed by an internally fitted DAC or phono stage option. The gold-plated chassis-mounted phono sockets, together with the two sets of parallel-connected 4mm speaker sockets, are hand-wired.

"a natural sense of space, together with the communication of breathing noises and guitar string-chatter, helped draw me in"

The sheer dynamics of Holst's Planet Suite (Colin Davis/LSO, FLAC CD rip) fell easily within the 3510's grasp. I was given insight into the performance, courtesy of its ability to resolve instrumental detail and convey a realistic stereo spread.

In terms of musical flow, the 3510 did not disappoint. Everything in its Right Place (here, quite literally true) and indistinct, from Radiohead's Kid A (FLAC CD rip), were delivered with the necessary attack and urgency.

So too were the insistent rhythms that punctuate the sharp brasses and distinctive sound of Afrobeat pioneer Fela Kuti's keyboard during the lengthy Unknown Soldier.

With the stripped-down bluegrass of Garrett Brennan's Alta Power® Day (2.8MHz DSD64) a natural sense of space, together with the accurate communication of breathing noises and guitar string-chatter, helped to draw me in – whether I was listening through speakers or headphones.

CONCLUSION
Exposure’s 3510 amplifier proves that more traditional solid-state technology can, if executed well, satisfyingly deliver the musical goods. Ours sounded beefy when required, yet was capable of channelling the most delicate subtleties – all in a musical manner. Unless you’re an active tape freak or possess numerous XLR-interfaced source components, the 3510’s connectivity and superb sound quality should ensure it a place at the heart of many a decent hi-fi system.

MEASURED PERFORMANCE
The Exposure 3510 produced 136 Watts into an 8 Ohm load (quoted value), increasing to 225 Watts into a 4 Ohm load. Most loudspeakers are now 6 Ohms, into which output is 185 Watts, so that’s the figure delivered in practice. It’s more than enough to go very loud in all situations.

Output impedance was very low at 0.095Ω giving a high electrical damping factor of 160, which will impose strong speaker cone control.

Frequency response measured flat from 8Hz to 20kHz (-1dB), unaffected by load value and volume control position. As our analysis shows however, output is starting to fall above 10kHz and this is sufficient to lessen any sense of sharpness, giving the smooth analogue balance Exposure favours (like Naim).

Distortion values were very low measuring 0.01% up to near full output (1kHz). At 10kHz the figures changed little, just 0.1% at 1W into 4 Ohms as our analysis shows, and typically 0.02%. Harmonics decreased steadily in level with rising order and did not modulate with changing level, suggesting subjectively distortion free sound.

Our sample came without MM phono stage or DAC.

The Exposure 3510 measured well, having plenty of power and very low distortion. It is a classic analogue power house successfully designed for smooth distortion free sound. NK

**EXPOSURE 3510 INTEGRATED**
£1,250

- **OUTSTANDING** - amongst the best.
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Hi-Fi+, 200th Issue

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A PAIR KEF Q150 LOUDSPEAKERS are on their way to DAVID MANSELL, Letter of the Month winner in our January 2022 issue.

Letter of the Month

SOFTWARE

System set up and placement are clearly very important factors in getting the best out of whatever kit one might be using, whether it be speaker positioning, what your hi-fi components sit on, reducing or eliminating vibration, dealing with reflected sound, etc, but I'm keen to know your opinions on room acoustics, specially the use of sound diffusers / absorbers.

I realise that you have probably covered most aspects of this subject over the many years that I've been a subscriber, soft furnishings being that happy middle-ground where me and my partner can actually agree on, but I'd be interested in your views on sound diffusers / acoustic panels / bass traps, etc., and their use, application and positioning within a domestic hi-fi set-up.

Looking into the costs, it would appear on the face of it that the use of sound diffusers / absorbers represents good value for money for an upgrade that would theoretically improve the sound of any system. Are there any makes and models that hi-fi enthusiasts looking to improve their room acoustics should consider, or is

Large-area lined curtains with deep pleats absorb a lot of sound, creating a quiet room free from reverberation. A great way to improve sound quality and the home at the same time.

Shown: Laura Ashley Josette at John Lewis.
there a DIY route that one could take
to get the same or similar results?
How many do you need, where
should they go, what placement is
most effective – back wall, corners,
side walls? And in what circumstances
should you diffuse and when should
you absorb? Thanking you.

Ian Davies
Thornton-Cleveleys,
Lancs.

Hi Ian. Yes we have covered this
topic many times but it is always
worth repeating for those who
missed our coverage. And this is
an area where improving acoustics
can improve the living environment
– as you and your partner agree.

I’ll go right into that. This
cuts our hard walls and floors,
and a generally minimalist
environment that echoes.
Interestingly it also cuts out
over damped environments that
sound acoustically dead, bit like
an anechoic chamber – a place
that drives a few people mad. See
YouTube videos about this.

Somewhere in-between is the
ideal room from a purely biological
stand point; an observation I
make because this is ultimately
a matter of personal preference. The
observations here are based on
my experiences.

Firstly, consider curtains. When
floor-to-ceiling, full room length
and lined, these are wonderful
variable absorbers, as you will hear
when drawing them. I fitted such
curtains long ago and prefer them
closed; my son promptly opens
them when I leave the room! But
at least it’s a choice you can make.
Drawback is price of course, that
can run into thousands. “Dad,
when are you going to change
those 1980s curtains?” When I can
afford to.

An obvious curtain source is
John Lewis, whose website has a
calculator and all the gruesome
detail you’ll need about pleats,
linings and what have you. Or go
to https://www.direct-fabrics.co.uk/
curtains/acoustic where there is
a lot of information specifically
about acoustic curtains, including
a video. These keep sound out
as well as damping down sound
inside. Google ‘acoustic curtains’
for even more.

On the wall opposite the
curtain should be some absorption
too – and here I use a small 2ft
x 4ft or so) colourful, patterned
rug hung from the picture rail. It
is positioned where sound from
the speaker hitting the wall will
bounce off to meet my ear at the
listening position (see diagram).

When a mirror on the wall shows
an image of the loudspeaker
from the listening position you
have the right spot. A rug here
is usually enough to damp down
reflected energy. Use absorber
panels if you so wish. However,
there’s no need to over do it or
the room will become dead. With
590mmx590mm tiles use four in a
square (£100-£300 total). Or
you can put foam behind a rug.

StudioSparcs have a wide range.

Carpet on the floor will
absorb a lot of acoustical energy
and Ikea even advertised a
thick carpet as suitable for this
purpose that we used in an office;
it worked well. You can use an
underlay also. Again, possibly best
to go too far. But carpets and
underlays also damp down noise
transmission from and to rooms
below, so there are other benefits.

The ceiling is a weird one.
Very high ones are a disaster
I have found, from a rented flat with
ceilings so high a step ladder was
needed to change a bulb. There
was no ceiling reflection; it was
like listening in an open field.
The sound stage existed between
the speakers only. You can hang sound

diffusers to cure this, attached to
a hard wooden board. Use white
diffusers and it will look like a
ceiling – even add some lights. If
the ceiling is low (<8ft) best to use
diffusion panels, since they will
give a feeling of height to the sound
stage by breaking up reflections.

Diffusers or absorbers?
Diffusers will give you a livelier
sounding room, but there will still
be a well focused sound stage
unmuddled by late reflections off
‘room boundaries’ (walls, ceiling, floor). I’ve used
them extensively in the
past and very much
like the result (see
Artnovion Myron E
at StudioSparcs). It’s
better than a heavily
damped room in
some respects, that
some loudspeakers
can struggle to light
up. Diffusers should be
attached to side walls by
those who want a clean,
bright room and the
same sort of sound,
but without the sonic
muddle. They can be covered by
acoustically transparent cloth
dissegue and to deflect dust,
as they are dust traps. Use four
590x590mm tiles in a group
(circa £300) – see our diagram. I’d
strongly recommend floor carpet

An Artnovion Myron E
Diffuser, StudioSparcs,
£79. Scattering Range:
350Hz to 6000Hz. Size
590mmx590mm. These are
very effective.
in these circumstances though, even if just a central rug covering a large area to provide some absorption. Always best to strike a balance.

Absorbers damp things down acoustically, to an end point of a room sounding dead. Just how dead you like a room to sound is up to you. As you stuff it reverberation time will fall until it starts to become nearly quiet. I've worked in a few big anechoic chambers (GEC Hirst Research Centre, National Physical Laboratory) and they are 'interesting'; you can hear yourself think. Although more disconcerting was NPL's echoic chamber (aka reverberation chamber) where sound never died out. It was completely beyond normal experience. Go in there with the missus and she'll never stop talking.

Stuff a room by adding foam filled furniture. I recall listening in my 17ft x 14ft long lounge when empty, then shortly after when a three seat settee, two seat settee and armchair had been added; they radically damped down bass, by acting as foam absorbers. Many settees have space under them and foam can be put there, to add more damping.

Corner absorbers? These are the one item I have never got to work. The reason is, I suspect, they need to be volumetrically large and stretch from floor to ceiling, which is impractical for most of us. But here we are getting into low frequency acoustics and bass quality which is another subject. It is also why I said look for hidden spaces under settees to add more foam, since it will help. Corners are high pressure but low displacement points; you can absorb energy outside them where displacement is higher, using foam in settees instead.

I like to keep to real ways of improving room acoustics because it is relatively easy to do. You can use furniture and furnishings to get a great sound in a room that is good to live in and 'partner harmonious too' - hopefully! NK

CAMBRIDGE R50 SPEAKERS

In the November issue your Opinion section about the Cambridge R50 loudspeakers brought back some of the most enjoyable memories! At that time, the latter part of the 1960s, I had them initially teamed up with the Cambridge P40, soon to be followed by the P60 and then the P100 respective amps, also with my then treasured Revox A77 (which to this day I regret ever selling) The R50s had replaced some elderly Celestions, if my memory serves me correctly.

This all took place in my first old cottage, which due to the interior design arrangements, sported a 20ft plus lounge that was only 11ft wide, great for listening and as far as I was concerned, this was the centre of my universe in the cottage of hi-fi.

I was most interested in your general comments about tall column speakers as I felt that the R50s were simply beautifully constructed and as I remember, weighing 98lbs a piece, costing £98.00 each: a fine example from the Bert Webb stable! I will not bore you with the details, suffice to say, that many, many years down the line I parted
with the R50s in a deal that involved a beautiful walk-in wardrobe being constructed which did make me terrifically popular at that time!

Several other column speaker models later, I fairly recently acquired a pair of Neat SX speakers which I find tremendous in handling all the different genres of music I enjoy, maybe the fact that the designer is a musician accounts for these being such superb speaker units?

Kind regards,
Donald R. McLeod Hawkins, Gloucestershire.

Hi Donald. You had an all-Cambridge system then, including the great R50s – impressive. I bought a Cambridge P50 amplifier that looked lovely. Great styling. It was very “fast” in its sound but I became aware of crossover distortion and, indeed, when measured it had an unlovely 0.3%. Next it went ‘phut’ after being moved. When I looked inside a stray wire clipping had rolled under one of the output transistors bolted to the base plate, shorting it out. Lovely, but not lovely!

The R50 loudspeaker was distinguished by its KEF B139 bass unit loaded by a transmission line and your 20ft long room would have been a good match. A KEF B110 mid-range and T27 tweeter were supplemented by a Coles super-tweeter. It was such a modern-looking loudspeaker at the time, as were your P40 and P100 amplifiers.

Anyone interested in recreating an R50 should take a look at a set of drive units made available by Falcon Acoustics, price £1051 for eight drivers in total. They allude to Chris Rogers who produced basic plans that I rewrote and compiled for publication in Hi-Fi Answers (August 1975) when editor. It was massively popular as a reprint back then, when transmission lines were the stuff of dreams and DIY a popular topic. The R50 was a product of those times. NK

LISTENING TO JONI

“The poor sound quality of early Joni CDs is often down to conversion to HDCD encoding” says David Pearce.

Hi David. Thanks for that insight, which is fascinating. Seems like you are an expert in the business. So readers understand what this is all about, the letter you refer to was from Peter Sherwood and printed in our October 2021 issue. It said of Joni Mitchell –

“Being a lifelong fan of the Divine Joni I could hardly wait to acquire the new boxed set of her first four albums on CD. I have the whole cannon of her output in the form of both CD and vinyl, but always have found her earlier work on CD to be full of digital nasties making listening painful at times. No doubt due to the poor quality of many “early” analogue to digital masters, an issue frequently addressed by Neil K.

My appetite being thoroughly excited by the positive editorial in the Music Press prior to release I rushed out and bought the package. The presentation of which is super, well printed, mat card, pleasing essay and a satisfying tactile feel. Getting home – straight to the high-fi.

Oh dear! Am I hearing this properly? “Blue” sounds exactly the same as my original CD complete with the familiar wince points! Check the others: “Clouds” as my original, “Ladies of the Canyon” as my original, “Song to a Seagull” much improved.

So what’s going on? I check very carefully the recording notes on the packaging and can only find any reference to remastering/ mixing on “Seagull”. Is it my ears?

A streamer like the Cambridge CXN (V2) £799 shown here is easier to use than a laptop and may suit Nick Miller-Jones.
No! Second opinions confirm my perception.

Needless to say a return journey to HMV ensued, who I know sell their goods in good faith, even though manufacturers are sometimes guilty of the opposite”.

HDCD (High Definition CD) was, as you describe, a product of its time where 16bit resolution could be enhanced to 20bit to give a smoother sound free from grunanchy quantisation noise.

Wikipedia has a lot more detail on its history and the technology. Great shame when it affects a good artist who was – ironically – trying to improve CD sound quality. **NK**

**WHICH MAC?**

A quick question (I hope): I am replacing my ailing 2010 MacBook Pro with another Mac laptop. I want to play Tidal, Spotify, Radio 3 etc out to a DAC. Which is best for audio, MacBook Air or Pro, and what features should I look for?

Or should I be looking at a streamer?

Many thanks in advance,  
**Nick Miller-Jones.**

Hi Nick. I use a MacBook Pro when interfacing via USB (to play DSD) and run it on battery to avoid earth currents that can badly degrade the dynamic range of external DACs or Rohde&Schwarz UPY analyser shows. The mains charging supply must not be connected in order to “float” the Mac for this purpose. It’s an idealised review set-up, not an especially convenient way to play music.

A streamer would be easier to use in the lounge I feel; sitting with a laptop picking through huge lists of music data is not my idea of relaxation or fun. I use the MacBook as I like to hear DSD in addition to PCM when reviewing. You will likely use it connected via Wi-Fi to receive the internet and then feed CD quality PCM (Tidal) out to a DAC (by cable!). It’s all a bit awkward – but then a laptop will do so much more than act as a music source and this is perhaps what you also want from it.

I am unaware of any differences in audio between these Macs. As you know, Mac audio can handle PCM at sample rates up to 768kHz or perhaps higher so no problems with Tidal, Spotify etc. Remember that output sample rate is set in

**Ortofon Verismo removable stylus guard. Getting it wrong is an expensive mistake.**

the peculiar Audio Midi control panel that lurks in Utilities, within the Applications folder – and you should select 44.1kHz for CD.

To warn you, streamers commonly rely on control from an app, run on iOS (not macOS), meaning an iPhone or iPad, connected into the local router through Wi-Fi. So if you go down this route you’ll need one or the other too. I hope this helps. **NK**

**REVIEWING CABLES**

In Alan Scott’s letter **Reviewing Reviews** in the December issue he refers to Martin Pipe’s review of a £2k mains cable Alan quotes Martin as saying “if you hear no difference don’t buy them”. I would have said “if you hear no improvement over your existing mains cable commensurate with an outlay of £2k, do not buy them”. The word difference may not be an improvement as I’m sure many people can testify.

Regards,

**Mike Bickley.**

**ON GUARDS**

For several decades now I’ve been an avid hi-fi fan and owned a good variety of hi-fi, starting in the 1970s with Amstrad 8000 amplifier / Garrard SP25 turntable and Solovox speakers. For anyone who can remember, these offered a basic and, in the case of Amstrad, sometimes unreliable nod to hi-fi. But you could listen to music quite cheaply which is what mattered at the time.

Over the ensuing years I moved upwards through better quality hi-fi culminating in Quad 34 / 405 amplifier set-up / Thorens TD160 with Audio Technica AT31 moving coil cartridge and Quad Electrostatic speakers (radiators as people commented on more than one occasion). The sound was brilliant and I lived with this system until mortgage and marriage priorities put such hi-fi on the back burner.

I had to move back down the scale, which felt like starting all over again, but family commitments ruined. Now in my 70th year my love of hi-fi / music hasn’t diminished. Only the limitations of age affect my enjoyment with slight hearing loss and slightly arthritic fingers, the latter making tweaks to the system a bit more daunting or simply the operation of placing the stylus on a record.

My system at the moment consists of Yamaha AST01 amplifier / Thorens TD160 / SME 3009 arm (saved from oblivion) / Audio Technica ATW45E and Elac Debut 6.2 speakers which I enjoy but the urge to improve things is never far from my thoughts.

However, through all these changes and hi-fi ups and downs there remains the one weak link that only a handful of manufacturers have tackled and that is the stylus guard. An item that costs next to nothing that can wreak havoc on any system of any price as I’ve found out to my cost. A piece of plastic

A safe and easy solution: the high quality flip down guard used by Audio Technica in their VM740/50/60 series of quality MM cartridges.

that has to slide on to the cartridge body in the hope that it will protect the stylus but on occasion does the opposite.

This simple nerve wracking manoeuvre has resulted in expensive stylus replacements as it catches the cantilever going on. Now I simply leave the guard off, defeating the whole point of it, but at least it’s cheaper than a new stylus.

Shure and maybe one or two others solved this problem and, despite purists saying it degraded the sound,
the fact that it did the job well of protecting a delicate and expensive item was, in my opinion, worth the trade-off. If only more manufacturers could resurrect this system it would save mine and maybe others nerves and wallets.

Which brings me round the long way of saying how much I agreed with NK’s comments in December’s issue which prompted me to write. Thanks for a great magazine that deals with the real, affordable world of hi-fi that I can relate to.

Julian Little.

Hi Julian. Thanks for your response to my querulous comment. I felt certain that others must be irritated by clunky styli guards, but no one talks about it. Am I the only one scared by them?

I almost feel guilty at complaining, long ago, that flip-down styli guards degrade sound quality. As you say, it is worth it just to avoid the threat a slide-on guard poses. As a reviewer of expensive moving coil cartridges I’m faced with a bizarre array of slide-on guards that frighten me, since most will destroy the cantilever if I make one false move.

Happily, an Audio Technica VM750SH MM I use has a lovely flip down guard. Trouble here is the cartridge is difficult to attach and the styli assembly very difficult to insert until you learn how to get it correctly aligned. Great sound quality though and a good upgrade for your AT95E, if more expensive at £365.

No doubt in my mind that Shure’s drop-down guard that cleaned the groove, eliminated surface static, damped the arm and protected the styli was ingenious and the best guard ever. NK

GO LOW

Reading Chris Frankland’s article on subwoofers in the September 2021 edition I can say that I had a very similar experience, although my discovery was more a case of curiosity.

A few months ago I had repositioned my whole system and had it sounding great, except moving the speakers (a set of floorstanding ELAC FS247s) into the room robbed them of some of their bass. My amp is a NAD Masters M3 and all the controls have to be operated by the remote. I decided to tweak the bass to see if that helped. Not as easy as I thought!

Browsing through the manual (after trying everything else) I was surprised to see it had the ability to add a Subwoofer. Why would anyone want to add a subwoofer to a stereo set up I wondered?

That got me curious so after reading up on the subject the consensus was that a subwoofer could have a really positive effect on the sound. In our back room I have a Paradigm S.1 speaker set up which has a subwoofer. This was relocated and connected and Holy Toledo Batman, I was stunned by how the music had taken on a richer more fuller sound soundstage and added clarity as well. Bass was not overdone.

Hi Geoff. Subwoofers seem to have gone out of fashion a bit lately and I think few people truly appreciate quite how fundamental and wide-ranging an improvement they can make to a system. Of course they will give extra bass weight, and that was your main reason for trying that route, but as you discovered the improvements they bring to the whole soundstage and throughout the frequency range is an unexpected bonus. I am glad it worked for you. CF

WAD 308B MONOBLOCKS

I enjoyed your piece “... mish-mash one that worked brilliantly” (Jan 22 HFW) and had a similar experience this week. I have been playing vinyl via a step-up transformer into my “room-heater” pre-amp with built in MM phono stage (Audio Note M6). In the evenings I’ve connected the speaker-out to Stax headphones as there is no line out on the M6.

I considered buying a separate MM phono stage to enable me to bypass the M6 And then. I remembered that about 30 years ago I had built the WAD 3-box kit (phone, preamp and their power supply). It took me a few hours to find in my overcrowded (hi-fi kit museum) of an attic. But once the Phono stage was connected to the step-up and then to the Stax energiser [valve Kinic modded] the music was absolutely magical I couldn’t believe just how good the WAD phono stage was!

But... another find, hiding under old suitcases in my attic, was a pair of the WAD Push-Pull 308B monoblocks that I remember building at about the same time to go with the pre-phone combination. Also a shoe box full of valves plus 10 x 308s I used to like valve-rolling. I stopped using them, I recall, because of a loud pop from the speakers whenever I switched them off. The caps had been upgraded to Black Gates and I made a number of other mods and, more worryingly, “improved” the design [my apologies to Andy Grove] But after 30 years of gently ageing grey-matter, I can’t remember what I did or why.

I’d really like to refurbish the P-P Monoblocks and bring them back into use and maybe upgrade some components and use some silver hook-up wire, also found lurking in a box under the bed. Seems like a fun
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But what I can’t find are the build instructions and circuit diagrams of the WAD monoblocks. I’d very much like to get back to the original design spec. and try and figure out what I changed. Also, what valves go where the shoe box has about 50 of varying types (I bought a lot of NOS Cryo versions).

And so I would be really grateful if you can point me in the right direction to get the original paperwork and circuit diagrams.

Best regards,
Edward Martin.

Hi Ted. As your amps are monoblocks I presume you are alluding to 300B PSE (parallel single-ended) published in the October 2000 Hi-Fi World DIY Supplement (we also had a 300B push-pull amplifier, but it was a stereo chassis, not a monoblock). These are scans from a Supplement; we do not now have instructions. World Designs (http://www.world-designs.co.uk) may be able to help here, including their forum and technical expert John Caswell.

The “pops” are worrying since they should not be there. Possibly an upgrade capacitor you installed is under-rated and failing. Check all voltages of course, and take great care because of the very high voltages. Wear the safety gloves supplied if you still have them; high voltage gloves are available on the ‘net.

I’m a bit surprised to see no fuses in this amplifier since they are needed to protect the output transformers should a valve fail. Some designers leave them out, feeling they compromise sound quality but I always wanted protective fuses to avoid the extensive damage a valve failure can cause. You may be able to install in-line fuses; use an ac/dc clamp meter to measure currents. The 425V feed to the output transformers needs fusing at least, in my view. With 40V across each 470Ω cathode resistor each 300B is running at 85mA so the two are drawing 170mA through the primary and around 200-250mA (fast blow) fuse appears about right.

I hope this helps you make sense of those mono blocks, since with ten 300Bs to try out you’ve got some rolling and great sounds ahead of you. NK
Material Difference

Focal release an Aria 906 loudspeaker with K2 sandwich cone. Noel Keywood checks it out.

Focal like using different loudspeaker cone materials – I recall both flax (Kanta) and slate-fibre (Chora) in their loudspeakers – and they sounded good. By this I mean “neutral”, unlike the bright sound of a metal cone for example, or the quacky sound of Bextrene. Their Aria K2 906 I’m reviewing here (£900) uses yet another material that comes from a range of K2 car speakers that have multi-layer ‘sandwich’ cones, an idea Leak introduced long ago using polystyrene with an aluminium foil skin. I should note that the Aria range
Focal’s own-design 25mm inverted dome tweeter using aluminium/magnesium for light weight and stiffness. It fires into a shallow waveguide to aid dispersion and improve sensitivity.

"the Focals had good projection, Johannette Zomer soaring out wonderfully singing Lascia chi’io Pianga from Handel’s Love and Madness"

also use flax, and there’s an Aria 906 with flax cone, but I’m looking at a K2 coned variant here.

Doubtless, Focal’s modern cones are slimmer, lighter and altogether more technologically sleek than that used by Leak long ago, but the idea remains: a light but stiff composite cone that doesn’t colour the sound. To achieve this in the 906 it has a dual-layer 16.5cm (6.5in) diameter bass/midrange driver. Focal’s spec sheet saying this is a “single skin” K2 cone with Aramid fibre layer on a “very light foam layer” for a “precise sound free from colouration”.

This bass/midrange unit works up to 2.8kHz they say, crossing over to Focal’s ‘TNF tweeter’ that has an inverted aluminium/magnesium dome said to give better dispersion than conventional domes. It has a smaller diameter, lighter rear drive (voice) coil for improved speed. The inverted dome is a 5in (25mm) diameter unit like most, equipped with Poron memory foam suspension. This driver fires into a shallow Urethane covered waveguide for improved dispersion. Measuring 390mm high, 225mm wide and 280mm deep the K2 906 is a large bookshelf / standmount design, coming in at a manageable weight of 8.5kgs. Focal provide it in Ash Grey finish only with an artificial leather front panel – and ours looked smart. There’s a lightweight front grille frame with acoustically transparent cloth that made no difference to performance on or off, measurement showed.

The rear carries mono-wire terminals only.

SOUND QUALITY

I drove the Aria K2 906s from our Creek Voyage i20 and alternatively from a PrimaLuna EVO 300 Hybrid amplifier. Sources were an Oppo BDP205D CD player with its ESS ES9038Pro convertor, and Bluetooth from the i20 to provide DSD and hi-res from an iPhone 11X, with 24bit resolution via an Onkyo HF player app. This was fed from the Creek’s pre-out into the PrimaLuna.

As expected from measurement, the Arias were clinically correct in tonal balance and just about colour free. Did I get to hear the forward firing port? Yes, but only when running them loud with heavy Rock having strong bass, like the strong metronomic synth beat from Safri Duo’s Samb Adagio. Then I heard boxiness and complaint, but at normal-loud levels they were clean enough.

Also as measurement predicted there was no sense of general warmth or fullness, instead a dry neutrality that was in its own way impressive. An academically correct sound I felt.

Running my torture tracks
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picked out a few characteristics that measurement had predicted. Squeaking Niels Lofgren's Keith Don't Go (CD) I got to hear rising treble above 6kHz from the tweeter as a sharp, thin hiss from the furiously strummed strings when volume was cranked up but for the most part – meaning with most music – this was not apparent. Higher guitar strings in tracks like Dreams from Fleetwood Mac's Rumours (24/96) were picked out strongly though, making the tweeter's contribution obvious.

When pushed right against the rear wall of my 17ft long lounge there was fast bass, but not deep bass, even when pushed hard with Lady GaGa's Bad Romance that has big energy around 30Hz. They were refined and teased out the essence - but walls remained steady and neighbours happy. So not ground shakers.

When I moved from torture tracks to more everyday material, especially vocals, the Focals had good projection, Johanneke Zomer soaring out wonderfully singing Lascia ch'io Pianga from Handel's Love and Madness (DSD). With Rock there was a fine sense of dynamic contrast, especially with the powerful sounding PrimA陇 that sympathetically energised these Focals, but this is an expensive amplifier unlikely to be used with a sub-£1k loudspeaker.

Running through a gamut of classical, strings were clearly lit and well differentiated – as Bach's Concerto for Flute, Violin and Harpsichord (DSD) made obvious.

A small sense of midrange push brought the elaborate harpsichord work to the fore, underlining that the Focal is a revealing loudspeaker, in an understated fashion. It delivers massive detail within such complexity that I could sit and enjoy, without moving to the edge of the seat. Well lit, not over lit.

CONCLUSION

The Aria K2 906 was clean, clear and light on its feet. It teased out a wealth of information and projected it strongly. Not a big, warm sound so much as a dryly analytical one. They need an amplifier with bass punch to liven the cones and with this I found them impressively capable.

**Measured Performance**

Focal consistently engineer their loudspeakers for flat response, avoiding the use of treble lift for artificial enhancement. And that approach can be seen in the Aria K2 906 where the bass/midrange unit reaches up to 3kHz before crossing over to the inverted dome tweeter that extends smoothly up to 20kHz. If anything there is a slight roll down up to 5kHz, enough to ensure treble does not get hard or fierce with poor quality CD. Upper treble above 6kHz does start to lift however, the tweeter rising to +2dB at 20kHz.

Output continues down smoothly to 60Hz before rolling away fast. The port (red trace) is tuned to 50Hz, also shown by the dip in the impedance trace, and this helps out a little with low bass. On balance though, whilst the 'speaker reaches low Focal don’t lift lower frequencies to add warmth or body to the sound. As a result it will sound dry.

Lack of peaks and dips suggests low colouration. There is little higher frequency output (box noise) from the forward firing port (red trace), so box honk should not be obvious.

Overall impedance measured a high 8 Ohms with pink noise, the 4.4 Ohm minimum set by d.c. resistance, as our impedance trace shows. This gives lower current draw than usual, but also restrains sensitivity to 87.5dB from one nominal Watt (2.8V) of input. It's still a good figure though, amplifiers of 60W or more being suitable for high volume.

The Aria K2 906 is a well engineered, accurately balanced loudspeaker for near wall use where it will give detailed, dry sound. **NK**

**Frequency Response**

Green - driver output
Red - port output

**Impedance**

**Verdict**

Clean and fast, but light bass.

**For**
- reasonably even balance
- detailed
- clean

**Against**
- lack warmth
- lack low bass
- hard character

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Ground Levelling

Martin Pipe's curiosity is piqued by Chord's GroundARAY noise-reduction device.

Some intriguing Gizmos recently came my way. My first reaction was to return this set of five vape-like aluminium tubes, with a ‘thank-you’ note to the effect that they were unnecessary as I haven’t smoked a cigarette for more than a decade! Then I noticed, at the end of each elegantly-machined cylinder, a different connector — USB type-A, male XLR, BNC, RJ-45 (i.e. Ethernet) or RCA/phono. Evidently, these must be rather specialised ‘e-cigs’...or something else altogether! Closer examination of one revealed an embossed legend: “CHORD GroundARAY”. Near the opposite end of the device, which is capped by a ‘C’ logo, are embossed ‘ribs’. These presumably help the user to grip its body, when attaching or detaching the GroundARAY to or from the appropriate socket.

A little delving later, and it turns out that the GroundARAY is actually an innovative hi-fi accessory manufactured by The Chord Company of interconnect and speaker cable fame. It’s billed as a “next-generation high-frequency noise-reduction device”. My first thought is that it’s a high-tech shorting plug, of the sort that Chord already sells for some Naim products. The job of a shorting plug is essentially to ‘ground’ an input, and in doing so help to reduce noise. Indeed, I have found shorting plugs on the unused inputs of vintage equipment I’ve bought in the past. Fine for phono sockets — but potentially-disastrous for USB and network ports.

In any case, I measured the resistance between the phono model’s central pin and barrel. This was infinite i.e. ‘open circuit’. I also noted that the BNC version didn’t have a central pin. I contacted Chord about this, just in case the sample was damaged. This is apparently deliberate. I was told, because “it doesn’t connect to the signal”. Evidently, then, the GroundARAY works along completely-different lines to those of a shorting plug. Chord’s units are sealed, and cannot easily be taken apart for examination. The Ethernet variant does however have a grub screw. The plug was loosened after its removal but could not be removed from the body, some kind of tough but not completely-inflexible resin holding it in place. The plot thickens!

Pressing Chord further, I was given the following explanation: “GroundARays, which have been developed over years, can be thought of as RFI absorbers or exchangers”. Derived from the proprietary TunedARAY mechanical-tuning system (as used in Chord’s flagship interconnects), they work by “reducing residual noise on the earth, and are not designed to ‘fix’ noise but further reduce its effect...they’re connected in parallel, not series, and do not enter the circuit. They connect only to earth, and provide a potential gradient”. The “carefully-chosen materials inside each GroundARAY cylinder are set in resin”, which explains why they cannot be opened/inspected. I then looked in vain for patents that could provide
me with further information.

Clearly, the GroundARAY isn’t going to yield its secrets to me without a fight. Disassembly of a GroundARay, which is “made in Wiltshire, using UK labour”, would be destructive. Given that they’re not particularly cheap – £550 a pop – I doubt that Chord would appreciate such terminally-intrusive investigation. And in any case, I have a deadline to meet! As well as the five demonstration units I was sent for review, there are GroundARAYs terminated with female XLR, HDMI and 5-pin DIN plugs. The availability of an HDMI version demonstrates that Chord is gunning for the AV market, as well as hi-fi. Indeed, Chord states that the GroundARay concept is suitable for DVD/Blu-ray players, TVs and projectors as well as computers, amplifiers, subwoofers, CD players, DACs and (presumably active) speakers.

Basically, you plug them into spare connectors. Experiment with different sockets, and settle on the one that gives the best results – a ‘quieter’ picture onscreen, or ‘blacker’ silences in the gaps between your music. Given that the GroundARay is quite heavy and long (10cm or so), you’re advised to install it where accidental ‘knocking’ is unlikely – a rear-panel connector, most obviously. I can imagine serious damage being caused to your equipment if you’re not careful. GroundARAYs, Chord explains, are “most effective when used across several devices” in your system. They can be used “individually, or in multiples such as...left and right outputs. Chord also advises plugging GroundARAYs into the unused digital inputs of DACs and streamers.

I tried different GroundARAYs with a wide array of hi-fi equipment, among them the Naim Uniti Headphone Edition (here driving Focal Utopia headphones) and Exposure 3510 integrated amp. Reviewed this issue, the Cambridge Edge streamer and power amp. I’ve been using for a good while now. Quadral Aural Wotan VIII speakers, a Prism Callia DAC and an Arcam A49 amp. A Technics SL-1210 Mk3, AT440MLb MM cartridge and Pro-ject S2 Ultra phono stage took care of vinyl. Through this equipment I played a wide variety of music, varying from chamber, choral and fully-blown orchestral works to pounding synth-driven dance music – hi-res, CD-derived and streamed radio. I was expecting to hear subtle improvements, as can be experienced after changing cables or flipping between the different digital filters of a DAC. To be honest, though, I couldn’t hear any appreciable difference – regardless of the specific sockets I plugged the device into.

Is it hokum, then? In all fairness, some have reported transformational performance improvements; I should point out that GroundARAY won Chord a prestigious ‘Grand Prix’ in Japan last year (bit.ly/3DHOxvX). So maybe there is something in it. It should be noted that I hold Chord in high regard, and indeed I awarded one of its products ‘Cable of the Year’ in the last issue of HFW. Perhaps valve equipment, which is more prone to microphony than solid-state gear, will benefit more from GroundARAY.

My advice is, as is Esoteric, to arrange a home trial with your dealer. If these unusual cylinders give you more of the music and less of the noise, then keep them in your system (if not in circuit). If not, send ’em back for a refund. Simple as.

**CONCLUSION**

Although the equipment I partnered them with is hardly in the super-fi category, these beautifully-made accessories didn’t make any significant difference to the enjoyment of my music – despite several weeks of experimentation. However, some ‘super-fi’ users have reported worthwhile results from the GroundARAY – my advice is to try before buying. Be careful how you install them, though – 10cm protrusions from front panel sockets are accidents waiting to happen!

---

**CHORD GROUNDARAY £550**

**VERSIONS WITH USB TYPE-A, RCA PHONO, 5-PIN DIN, XLR MALE, XLR FEMALE, BNC, RJ45 AND HDMI CONNECTORS AVAILABLE**

**GOOD - worth auditioning**

**VERDICT**

GroundARAY might prove worthwhile with esoteric. It did not work for me.

**FOR**
- construction
- many different connectors catered for
- far too neutral - neither adds, nor takes away

**AGAINST**
- Expensive!
- I couldn’t hear any noticeable difference
- very long design restricts positioning

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WORLD STANDARDS

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trad warmth that should appeal to many.

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cance (30 Ohm – 300 Ohm) headphones the little
Creek has a marvelously well-judged sound.

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sound.

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much bigger than they look.

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trad warmth that should appeal to many.

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PP3 battery-powered portable gives great sound
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Hi-Fi fan.

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criticism. Devoid of its own character but has a
flawless presentation.

EXPOSURE 101 £395
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be an automatic entry on any demo list at this
price.

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WORLD STANDARDS

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

OPPO BDP-1050 £1,200
Universal player and DAC that makes CD and Blu-ray (± DVD) sound deep, spacious and full bodied. Reference quality that’s affordable.

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

TUNERS

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

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

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

DACs

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

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**BLACK RHODIUM TWIST**  
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**AUDEZE LCD-3**  
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A planar magnetic phone that offers monitor quality. Strong sound with silky, dark quality that others struggle to match.

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

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Tremendously fast with a strong, focussed, lower-frequency range and a firm bass punch.

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**ASTELL&KERN AK100 MKII**  
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**FID X3**  
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Fabulous value player with nice easy sound and full range of abilities. Small and light. For review.

**LOTOO PAW GOLD**  
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Reference quality sound; it’s like carrying your hi-fi in your pocket. Equally large too, but stunning headphones quality.

**NAIM HDX**  
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“A master craftswoman at work, her songs as evocative as ever” —The Irish Post

“Naked Music is an excellent album from one of our finest performers” ★★★★
—R2 magazine

“Nothing short of a classic” ★★★★
—Maverick magazine

“Eleanor McEvoy is one of those artists who can do no wrong... what a voice!”
—Alex Lester, BBC Radio 2

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"you don’t want to know how professionals assess sound quality either"

I am not the only one at it. There are companies and organisations around the world that must also judge sound quality - and if they get it wrong it affects us all. So how do "professionals" judge sound quality? Get your hanky out and he prepared to cry.

I first got a hint of the problem when reading about the development of MP3 in a lecture by the assertive Karl Heinz Brandenberg of the German Fraunhofer Institute. How - I asked myself - did you decide MP3 has no affect upon sound quality? Simple they listened to it. And came to the conclusion - forcefully stated - that around 90% of musical information could be thrown away without anyone noticing. Hmm...

By what method and with what equipment did they reach this conclusion? What were the test conditions and where the tests conducted by an independent audience that had no commercial interest in a system that Fraunhofer today explain became a "worldwide audio standard that had a positive effect on the German economy". Nothing.

As Philos once told us CD was perfect and "all else galstive", Fraunhofer told us MP3 was equally perfect with no mention of how they reached this conclusion. And since then MP3 has become the whipping boy of digital compression systems - and rightly so it strips music of organic form.

Leaving me interested in how professionals conduct listening tests. I was to find out.

Digital compression schemes must be assessed subjectively for their impact on sound quality. And boy are there a lot, not just from Fraunhofer and the Motion Picture Expert Group, but Microsoft, Apple, Dolby, Sony and many more. That's a lot of listening tests going on around the world. How are they being carried out and with what equipment? All these companies must be using high quality audio systems surely?

Researching Bluetooth for a column in the October 2021 issue, which uses aptX compression, I hit a gem - a paper about the 'subjective assessment of small impairments in audio systems' from the International Telecommunications Union, BS 1116-3 from the BS series they say;-) Sadly, that's the only funny bit: it otherwise made gib reading.

Such papers consistently repeat a mantra, the main being blind A/B/C comparisons and statistical analysis techniques - pointless when the basic tests are inept, producing worthless data.

And that's what I read here.

They say twenty people are needed for a useful result perhaps, but not all in the same room at once. I've organised and participated in many such trials and no more than five is tolerable. Otherwise no one has an ideal listening position and their ears are shielded by others. There must be silence and no opinion signaling. No lunch breaks at the pub either.

A ways best for one person to listen under no pressure, in control of music selection and able to choose length of exposure. But this is very difficult to do in practice, especially if twenty people have to pass through in sequence. It means around ten days of listening with problems of non-arrival, lateness and much more. In other words, such testing is very difficult to execute - and expensive. Doing this many times - as you have to - is impracticable.

The real breaker in this report was that of programme material. It is vital to choose programme that is able to "break the code" in the case of digital compression systems that the ITU appear to be talking about here (they don't say!). The older schemes like MP2 and MP3 went to pieces with massed strings, that became a blurred mess. They possess high frequency energy in a complex pattern the ear is able to interpret and understand.

Programme material has to be selected for listening tests yet there's no appreciatory in this paper of programme spectral content, dynamic range, nor human sensitivity to speech, vocals or musical instruments.

In fact, the human side is totally missing. And without suitable programme material that is both realistic yet challenging, there's no point in continuing. Differences will not be revealed, leading to the conclusion the compression scheme is perfect. Is that what happened with MP3?

The paper is hugely detailed in areas known about, such as listening room acoustics, and statistical techniques, but bareilly even says about central issues such as the replay system itself (hardware) and the listening conditions.

This look at a 25 page technical document on "how to assess sound quality" neatly illustrates the difficulties by its creaked incoherence. Too much virtue signalling, not enough understanding. But this is what goes on in the background where conditions audiosophes expect to work under, such as a nice peaceful lounge not populated by twenty people, and music more challenging than that from Engelbert Humperdinck is used. You don't want to know what the neighbours get up to and you don't want to know how 'professionals' assess sound quality either!

How would I do it? Simples. I'll cover this next month.
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"So, when your favourite group splits, you know who to blame"

One of the principle reasons that bands split up is down to 'musical differences', which, as you and I both know, can mean just about anything.

It can, of course, mean just that, which is often the most surprising thing of all. It can also, now I come to think of it, come down to girl-friends imposing themselves upon the rest of the band and sleeping on a mattress while the rest of the guys are trying to get some work done in the studio. Thank you very much indeed. Actually. If that's all right with you, John.

But many of the reasons that culminate in the eventual disintegration of any one band falls to this one word: money.

There's nothing that makes a musician feel as unloved as not getting a fair shake.

It's all about credit. It's about the 'and grab', isn't it? Once those starry young fools, the same sly sads who can't do enough for everyone involved at the beginning and "we're just glad you be here".

When those selfsame kids wise up and realise that they're being taken for a ride by the record labels and suddenly understand that it's the song writer who makes all the money and they're subsisting on pocket money and they're all getting older and "Am I destined to be a homeless derelict with a few memories and ten ex-wives?" Then the conversations become serious.

This increasingly nagging subject. This talk about the source of monetary wealth for the lucky few song writers attached to successful bands. This growingly important matter. It has caused more arguments and court cases and the fracturing of bands and personal relationships than just about anything else.

Isn't that right, Pink Floyd? And to some extent The Beatles? The Smiths? The Jam?

Is this why the members of Queen always looked so calm, collected, happy and content? Because they split the cash four ways? I would wager that yes, that was the case. Actually. I don't know the exact details of the cash split. I do know that the likes of Blur, REM and U2 had the sense to look around them before they jumped into the murky world of rock music management and rock music contracts.

All three, so I'm given to understand, give 20% of the takings to the song writer. After all, that, the remaining 80% of the income is evenly split between the band (including the song writer who is now seen as a musician in the same band). This means that everyone is getting a fair slice of the pie.

And why not? Writing the song is incredibly important but so is the arrangement of that song and its final composition which often features incredibly important contributions by the rest of the band. Shouldn't they feel valued and part of a team in such circumstances? I think so.

Let me ask you this. I wonder how Herbie Flowers feels. Herbie Flowers, the long-standing, much respected and highly talented guitar player who has appeared on his own records and many others. An industry legend is Herbie. How does he feel when his iconic bass line on Lou Reed's 'Walk on the Wild Side' is quoted in exactly zero monetary-based credit? Reed is quoted as the song writer but surely, where would that song be without Flower's bass line? Hmm?

If Herbie had said, "OK, Lou. I'll just sit here, shall I? You record that song with your acoustic and I'll wait. No rush ol' son. That song would have been a shadow. Flowers deserved a formal credit for his part in the arrangement. And I don't know, did he have anything creative to say in songwriting terms relating to that bass line, perhaps?

How about 'Come Together' from the Beatles? Where would that song be without Ringo's drums? A much aligned musician is Ringo but he's critical on that song, Critical.

And this is all down to tradition and a pre-group way of thinking. It's a Tin Pan Alley mindset. A Brill Building way of doing business. That is: "My friend and I are the song writers. We've just finished it. Here it is. Now, would you like to sing our song? Mr Singer? OK, you get paid for doing whatever you do, we get paid for writing that song. For selling the sheet music."

That's and then their structure never changed when the revolutionary popular group/band became a dominant form. When band members began to write their own songs in and around the early sixties.

At that time, a hit record was suddenly more than 'just' the song. The song was bespoken to a particular set of musicians at that time and no other. And that group contributed the house sound that turned the song into something unique.

Trouble was, the trad way of writing songs was never changed or updated.

So, when your favourite group splits, you know who to blame. A conservative music industry who, when faced with change, rather than innovate, runs screaming back to a secure template that they know works...and pays.
**ROMA 96DC+**

The Synthesis Roma 96DC+ is a 25W Class A stereo integrated amplifier, utilising four high-quality EL34 and two ECC82 valves in the design. Featuring a variety of digital and analogue inputs, including a moving magnet phono stage; it is both a high-end performer and a wholly convenient solution for music lovers.
"the film uncovered other early British electronic-music composers, Brian Eno and Daedvid Allen, for example"

During WWII the Nazis used magnetic tape recording to disseminate Hitler’s speeches via German radio. Captured ‘Magnetophon’ found their way to the US and Britain after the war, forming the basis of a burgeoning new industry that peacetime Germany also benefited from. In 1961 Grundig announced that it had sold 100,000 of its TK20, an affordable single-speed (9.5cm/s) half-track mono machine for family use or budding musicians. Indeed, a TK20 was used by the Quarrymen...and we all know what became of them.

Long-distance and international phone calls were prohibitively expensive in the early 1960s, but tape provided an alternative. ‘Tapesponding’ relied on the exchange of reels via post. You would record your contribution onto tape – usually a small spool of the stuff, suitably-packaged by manufacturers like Scotch, to keep postage costs down. Tapesponding allowed recorder owners to stay in touch with distant relatives – but subsequently the concept expanded to strangers.

The British Recording Club was affiliated to ‘local’ tape-recording and cine societies in towns and cities around the country. Every month, the BRC published long lists of tapespondents in its magazine ATR (Amateur Tape Recording). Each entry would contain the name, occupation and (unimaginably today!) address of the tapespondent - together with a description of the recorders at their disposal (to ensure tape compatibility; TK20s, I note, were popular), musical tastes, languages spoken and a tally of hobbies, to get the ball rolling.

Tapespondents were usually UK-based and male. However, most directories contained a smattering of would-be correspondents in countries like the USA, Australia, South Africa and Ireland.

ATR published much more than tapesponding lists. In addition to the staple magazine fare of news, reviews, columns, interviews with celebrated tapists (January 1961’s ATR featured Russ Conway) and advertising were short plays, written for tape-recording clubs, and technical features. From the latter, avid readers could build mixers, grasp the fundamentals of magnetic recording, learn how to edit and develop microphone technique.

A prominent name here was Fred Judd who was ATR’s technical editor. Some of his articles explored pre-synthesiser electronic composition, sound-processing like tape loops and musique concrete. The latter, which manipulated ‘found sounds’ to creative effect, could have been made for tape recorders. Exponents of this ‘electroacoustic tape music’ included Stockhausen and Schaeffer. Judd won at least one major prize for his compositions, some of which were used by TV (most famously, Space Patrol and The Tomorrow People). He had a primitive synthesiser operational by 1963.

Experimentation with musique concrete and electronics took place in broadcasting studios, notably those of the ORTF. Such techniques were also the stock-in-trade of the BBC’s Radiophonic Workshop, which – as electronic musical experimenter and film-maker Ian Helliwell reminds us, in the newly-published second edition of his absorbing book Tape Leaders – was a “closed shop, geared towards servicing BBC productions”. Although some experimenters (among them female pioneers Daphne Oram and Delia Derbyshire) were at some point employed by the BBC, most British work in this field was undertaken in private self-funded facilities.

The idea for the book came in 2011, when Helliwell made Practical Electronica – a feature-length film about Judd. He visited Judd’s widow, who gave him access to archives and tape recordings. Research for the film uncovered other early British electronic-music composers. Some of them (Brian Eno and Daedvid Allen, for example) would become more familiar names. They, along with Oram and Delia Derbyshire, are biographed in Tape Leaders.

Tape Leaders also covers early British synthesiser studio and manufacturer EMS (Electronic Music Studios) and the men behind it – Peter Zinovieff, David Cockerell and Tristram Cary. This groundbreaking organisation explored the musical potential of DEC’s PDP8 minicomputer, as well as producing iconic synthesizers like the VCS3 and Synthi models (used by performers like Pink Floyd and Jean Michel Jarre, as well as the Radiophonic Workshop). There is excellent use of nostalgic imagery from the 1960s and 1970s and Helliwell has also assembled a CD of early electronic pieces by some of the authors in his compendium. This CD accompanies the £25 book, which is published by Velocity Press (bit.ly/3p8AaD). Essential reading and listening, if you’re interested in electronic music.●
A n Anthology you say? So then, that means that albums have been combed, hit singles collected, tours have had their live gems picked and prodded and a gamut of rarities have been found amongst the dust bunnies under that speaker stack...the one in the corner. Over there by the bucket of water and Dettol.

Well no, not really. This band only ever released five tracks. And they were scattered like Dandelion seeds in the wind, as it were, over singles and compilations.

London based and ‘alive’ from 1996 to 2004, this rock, 4-piece band reminds me of Lou Reed in some ways. Lou Reed’s brain, that is. So not necessarily in sound terms but in terms of mind set. Reed and the Brazen Hussies shared a similar playful disrespect for the song form, a fascination with discordance and a city sound that smacks of too much traffic, too many people, bright lights, broken lights, dim alleyways, threat, danger and edge. Whether that be the mugger’s knife or the decaying urbane.

There’s also a fresh and playful element here that mixes rock with an appealing harmonic integration so you end up with a sort of punk rock meets soul meets disco effect. The aggressive with the gentle. The melodic with the jarring. The tuneful with the chaotic.

I see this album for sale on the Internet and I see it under tags like punk and hair rock and prog and I don’t recognise any of these things. This music is serious. Really. It’s experimental. It reflects deep thought. Meticulous preparation. Don’t dismiss it. Give it the respect it deserves.

Oh, incidentally, the CD and LP versions have a different track order. So, if the music doesn’t confuse you, the sleeves will.

Emerging from the beat era and then the R&B and psychedelic scenes, the British-based Pretty Things were never the stars they probably should have been. Then again though, I’m not sure their music or even demeanour would have suited that status. Their rather shabby appearance sign-posted their ‘don’t care’ attitude and a sense of the dangerous and the brutal that just wouldn’t have washed in the finer halls of stardom.

Even fans of The Rolling Stones who delighted in that band’s dark and roughish presentation would have thought twice about meeting a Pretty Thing down a dark alley.

Saying that, guitarist Dick Taylor was part of the early Stones line up before he and Phil May started the Pretty Things as a going concern. Their work moved through the core rock structures yet they found time to experiment producing what is arguably the first rock opera in S.F. Sorrow (1968) with Parachute (1970) their rock/psyche/pop masterpiece.

The band would split and fracture but always return, finding creditable comeback LPs in the nineties, naughties and beyond with reissues relinking their oeuvre.

The band have become rock fixtures. Famous for not being famous. Oozing street cred by the plastic cup full.

This six-disc compilation tracks their rocking progress from 1964 to 2018 within three gatefold sleeves plus a packed, forty-three page book that sits within a slipcase outer.

Shows featured include the Saturday Club in 1964, Top Gear in 1968, Sounds of the 70s in 1970, Radio 1 Session in 1972, John Peel’s Show in 1974, In Concert in 1975, Mark Riley’s show in 2018 and a whole lot more besides.
Ventura was active during the forties and fifties as an alto saxophone player and then, later on the tenor sax on which he settled upon for the duration. His entry into music came one day while working at the Philadelphia Navy Yard when he received an invitation to join the Gene Krupa band. An event that was just a little uncommon. Because he valued his regular weekly pay cheque he – and let this one sink in – turned them down. Krupa, to his credit, didn’t mutter obscenities and move on but actually called him again for another go. This time Ventura accepted and became a soloist, along with Roy Eldridge and singer Anita O’Day.

I find Ventura an enigma because this was a guy who tried to deliver bop to a wider audience. He even ultimately ran a band called Bop for the People. But surely Ventura was a swing artist! Was the notion of bop a jazz style that he could capitalise upon? Realising that maybe swing had had its day as a mass consumer music medium? Perhaps – and the move would certainly bring him into contact with some of the greats including Bennie Green, Charlie Parker and Buddy Rich.

Ventura’s work was down to earth but never shoddy. His solos were clean. You can hear that on ‘Adventure With Charlie’, initially produced by King in 1957 with John Coates, Jr on keys, Billy Bean on guitar, Gus Nemeth on bass and Tony DeNicola on drums. The players contrast but also complement, the music blends ballads with mid tempo movers.

On this CD, you also get ‘Gene Krupa: Jazz Trio Live at the Band Box’ from January 1953, recorded live at New York’s old Birdland which is a useful bonus for fans.

The first of two newly released albums.
‘Voices in my Head’ is a new double album gatefold, limited to just 100 copies, and exclusive to CD! That put a smile on my face. I’m happy to see a bit of love come CD’s way. Vocals are included via Ditsea Yella, Eireann Musique and Lara Dennis. Apparently, included with this CD is a download of 112c’s previous album, ‘Special X’. Although I didn’t see that extra within my review sample. This album is 112c’s determination to do a vocal-orientated album and, well, I have to say that I disliked it intensely. I was actually annoyed. I felt the lyrics and vocals – shipped in by 112c’s collaborators – diluted the power of 112c’s music which I normally find affecting, moving and powerful on its own. The voices and lyric work on this release moved this 112c album to the Me Too pile or, worse, the ‘Yoof’ circuit. I found them superfluous.

Yes, there are instrumental versions of a lot of the vocal version on Disc 2 but I feel that these are compromised because they are made with vocals in mind which skews their inherent structure in the first place. There are spotted highlights here but not enough.

‘10 Chords’ is intriguing because I feel this notes a progression of the 112c direction from a largely Tangerine Dream-esque signature style to one that is infused with anger. A more industrial feeling speaking more of angles, resistance, energy, force and a sense of the harsh, the unyielding and the fractious. Whether this reflects commercial considerations or reactions to personal events I’m not sure. It’s an intriguing move, however and one to keep an eye on.

Voices in My Head/10 Chords
Pink Dolphin/112c
Mini Marvel

Martin Pipe’s ears host Sennheiser’s midrange wireless IEM contenders.

Bluetooth IEMs – in-ear monitors – never cease to amaze me, and not just because they’re so effective at freeing the listener from tangle-prone cabling. Into each tiny bud must be crammed not only the transducer (and associated acoustic chamber) but a Bluetooth wireless receiver, digital signal processing, DAC, amplifier, control system and the battery needed to power it all! Some also build in microphones, and all that accompany them. Not only are there space constraints, but these marvels of micro-engineered sound technology must be low in weight to ensure comfort, and prevent gravity from doing its worst. Sennheiser has managed to produce not one, but three such ‘True Wireless’ devices. Midway between the ‘entry-level’ CX (£99) and ‘high-end sound-tuned’ Momentum 2 (£189) sits the £129 CX Plus featured here. 

Weighing a mere 6 grams each, the CX Plus will deliver 8 hours on a single charge. When not in use the two buds are stored in a special hinged case, magnets snapping them into position. This case has enough internal battery capacity to provide a total 24 hours of use, and keep the buds...
They stayed in position, thanks not only to their shape and lightness but the lack of wires. I easily partnered them with two Bluetooth ‘sources’ – a Sony Nexperia 10 Android phone, loaded with the VLC app, and an Astell&Kern SR25 personal music player. A female voice confirmed pairing and other operational parameters.

Both of my devices were remembered, although when switching between them I had to shut the buds away in their case thereby effecting a crude ‘reset’. Using a mobile device, it’s possible to draw on the features of Sennheiser’s free ‘Smart Control’ App (Android/iOS). This acts as a ‘usage guide’, enables firmware updates and allows you to configure the buds – noise-canceling behaviour, equalisation, ‘Transparent Hearing’ (ambient pickup, akin to the ‘talk-line’ function of early Walkmen) and (it turns out!) managing the devices to which the CX Plus is paired.

I found that, as delivered, the midrange sounded rather sharp, imparting a rather nasal character to speech although rock guitar seemed to benefit. After several hours of ‘burning-in’, the tonal balance shifted. The presentation had by this time settled on a crisp and incisive upper-midrange and treble, with plenty of attack and a well-defined stereo image. Such forwardness does aid subjective clarity – this was particularly noticeable with Radiohead’s ‘Idioteque’, the complex machine-driven rhythms that lurk in the background being easily discernible. Various house music cuts, and Talking Heads’ ‘Born Under Punches’, demonstrate that bass isn’t particularly impactful.

However, what you do get is fluid and punchy; it’s definitely a case of quality over quantity here. There was alas an annoying tendency for the Bluetooth connection to drop out randomly. One channel, and then the other, would ‘blip’ before audio was restored; this happened with both the Sony and the A&K. The noise-canceling feature isn’t the most effective I’ve heard, but it doesn’t mangle the music as badly as some.

Even with Bluetooth, the CX Plus is a damn sight more musical than the sonic joke that is the average smartphone headphone amplifier.

**CONCLUSION**

On the whole, the CX Plus is a well thought-out package. Its wireless circuitry introduces lossy compression, and so to minimise sonic impairment it’s a good idea to store music losslessly on your playback device. Although a system like this is never going to be as transparent as a direct wire link between player and transducers, the CX Plus nevertheless does a worthwhile job – for many listeners, the marginal subjective impairment and occasional dropouts will be more than outweighed by the convenience and practicality offered.

**As well as the CX Plus earbuds themselves, £129 buys this neatly-curved ‘charging case’, a USB charging cable and four different sizes of ear-tip.**

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**REVIEW**

*Sennheiser CX PLUS, £129*

**EXCELLENT** - extremely capable.

**VERDICT**

Sennheiser has spent time on the design of the CX Plus. In performance terms, it’s more than acceptable although some rivals fare better.

**FOR**

- decent overall package
- punchy and detailed presentation
- upgrades most smartphone audio systems

**AGAINST**

- occasional dropouts
- rather subdued bass

Sennheiser bt:ly/3TSyRM

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To ensure the earbud contacts always make contact with the sprung pins of the charger, fairly powerful magnets are used. As can be seen, they are mounted in the case.

‘topped up’ when you’re not listening to them. The case is itself charged via a USB-C connection. No mains unit is supplied, but you get a USB-A cable for charging via a PC. To accommodate all that sophisticated electronics, the IPX4 moisture-resistant bodies of each bud are noticeably larger than the average budget ‘wireless’ IEM but sculpted to comfortably fit your pinnae and ear canals.

To their nozzles, which direct the output of the 7mm ‘TrueResponse’ moving-coil transducers towards your ears, are attached your choice of tip – four different sizes are included. Into the opposite ends of each CX Plus bud are set buttons that – depending on how they’re pressed, and the equipment you’re partnering with them – sequence through tracks in either direction, pause playback, change noise-cancellation mode and adjust volume. The Bluetooth 5.2 radio link to your device supports the AAC, aptX, aptX Adaptive and SBC codecs meaning the CX Plus should give decent sound quality in a majority of scenarios.

Active noise-cancellation is supported, and the beamforming MEMS (micro-electromechanical system) ‘chips’ microphones – two in each bud – that make such cancellation possible are also used for hands-free phone calls. The CX Plus buds, which are marked to identify the specific ears into which they should be inserted, fit very nicely and are comfortable to wear for extended periods. The eartips fit to the nozzle of each CX Plus, behind which lurks a 7mm moving-coil driver. Also visible are apertures for the microphones that make hands-free calls and noise-cancellation possible.
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Cheap as chips

Martin Pipe gets under the bonnet of a 1988-vintage Hitachi DA-7000, a machine intended to bring CDs within reach of more people than ever before.

By the late 1980s, CD players were gaining popularity. The silvery digital discs that listeners respectfully placed on their motorised trays had revolutionised the music industry, paving the way for the next decade – one that would prove extremely lucrative, not least because extensive back-catalogues could be ‘repackaged’ for consumers who had already bought the vinyl albums or cassettes! There was also the newly-introduced CD-ROM, offering computer-data storage capacities of a magnitude that must have seemed unfathomable at the time.

However, it was music that drove public demand for the format in 1988. CD was resilient, convenient and sounded good. But back then it was a new and expensive technology. In packaged hi-fi systems the electronics was in one enclosure. In these cases an expensive matching CD player, designed for stacking underneath, was sold separately. That way the customer wouldn’t have to shell out for CD if it wasn’t immediately-required, but could upgrade afterwards. But such a budget optional CD player wasn’t much cheaper than the rest of the equipment put together! This was, after all, high-tech stuff back in ‘88... Super low cost CD players were needed to reach the budget market.

And so to the Hitachi DA-7000 featured here. Hitachi was once a serious contender in specialist hi-fi. It made some decent tuners, receivers, turntables and cassette decks. This enormous Japanese corporation also helped to popularise MOSFETs, came up with Class G amplification (‘Dynaharmony’) decades before anybody else and invented a cog-free ‘Unitorque’ direct-drive motor. By the time the DA-7000 was available though, Hitachi was in the process of strategically withdrawing from a declining ‘genuine’ hi-fi market. This mid-width CD player was designed to match mass-market Hitachi audio like the HRD-MD03 – a single box containing a twin cassette deck (with Dolby B), three-band analogue tuner and 30W per channel amplifier.

However, the DA-7000 – then the most affordable CD player in Hitachi’s line-up – could also be used to upgrade ‘pre-CD’ audio systems that featured an auxiliary stereo input, such as earlier rack systems and music centres,
It may not be the world’s most sophisticated CD player, but there’s nevertheless plenty going on inside the DA-7000. In the thirty or so years since its availability, much of that circuitry has been crammed into a chip or two.

whether or not they were made by Hitachi. It is as basic as CD players can be, with an analogue output on phono sockets (no S/PDIF here!) and little in the way of programmability. Back then, connections were all analogue, external digital cabling, interfacing with digital inputs and outputs being for the high-end only.

No provision was made for remote-control, the user having to press buttons on the front panel instead (one thinks of old tellies here). The function legends printed on the buttons of our specimen, found inside the VCR compartment of a TV stand abandoned by a local auction room, are rather faded as a result!

There was evidence of the disc tray having been forced open, the loading belt – sticky black gunk by the time this DA-7000 came my way – had probably started slipping at some time in the player’s history. After I replaced the belt the machine worked perfectly – pretty good for a complex piece of consumer electronics that’s more than 30 years old! Two seven-segment LEDs visually-confirm the track currently being played.

An upgraded version, the DA-7200, was supplied with a handset, and featured a more informative fluorescent display with timing as well as track number. In other respects, the players are identical and share the same service manual.

A closer look at the circuitry described in this document reveals that a single (mono) DAC – an obscure Hitachi-made chip known as the HA12096 – is shared between the left and right channels. In the 1980s, 16-bit DACs were expensive devices. If you can get away with one, instead of two, then you’ve saved money. This is important for manufacturers of budget gear; where costs must be shaved in order to remain competitive in a price-driven market. Hi-fi designers could only afford to allocate one DAC per channel even in their more upmarket CD players; the number of DACs was often proudly-disclosed in catalogues.

This ‘single-DAC’ process may seem strange today, but was common at the time – especially in Japanese players. Basically, the

Reliant on 1980s technology, the DA-7000’s main circuit board is rather busy. The DAC section occupies the top left of the board – its 22-pin Hitachi chip and output filters (the green lumps) are clearly visible. You can also see the microcontroller and two dedicated LSI chips.

Like every other CD player, from the Sony CDP-101 to the latest models reviewed in this magazine, the DA-7000 relies on an optical pickup with semiconductor laser. This one still works; appropriately enough, a 1980s Hitachi slogan was ‘in a word, reliability’!

DAC’s conversion duties alternate between the left and right channels at high speed (microsecond timing!). When one channel is being converted, the other of course isn’t. To fill in the gaps, which would be audible as glitches, an analogue-memory technique called sample-and-hold is applied. Basically, the voltage of the channel being decoded is stored in a capacitor and, using fast electronic switching, fed to the audio output during the instant when the DAC’s attention is on the other channel. There are two of these circuits, one for each channel, known as ‘deglichers’.
Not much to see here – only a captive mains lead and phono sockets yielding an analogue line-level signal of 2V maximum, CD’s Red Book standard. In the 1980s, digital outputs were rare – even on high-end CD players, let alone this one.

In the DA-7000, such arrangements add no fewer than four extra chips – albeit cheap op-amps and CMOS switches – to the player’s bill of materials. However, the outputs require relatively-complex filters to remove any residual switching noise. These can, alas, introduce frequency-dependent phase problems. With the associated passive components and circuit-board ‘real estate’, the DA-7000’s arrangement can’t have been particularly cheap to implement. It says something about the expense of early consumer DACs, and the ingenuity of engineers when faced with a challenge. Later variations of the approach use additional digital processing and faster single-channel DACs. Here, the data coming off the disc is ‘upsampled’ to 88.2kHz before conversion, enabling the use of simpler (and kinder) output filters.

Even decent DAC chips are inexpensive nowadays, and so there’s no need for such cheeseparing – even in the cheapest and nastiest of digital audio players.

In Europe, things were rather different – with two-channel DACs even at the bee-money end of the market. Amstrad’s CDX400 mid-range system included turntable, tuner; twin tape, 3-band equaliser; 2x10W amp, 2-way speakers and CD player. In 1988, Argos sold this lot for £199 – in contrast, the DA-7000 alone retailed for around £150. The CD player behind the CDX400’s front panel was a Philips-made transport…with TDA1541 stereo DAC. Not that you’d be able to hear the difference between this respected DAC and Hitachi’s ‘multiplexed’ mono-DAC arrangement, through the Amstrad’s mediocre amp and speakers.

To put it kindly, the DA-7000 is not one of the best-sounding CD players out there. It’s gritty, bright to the point of harshness and bereft of the subtleties that bring you closer to the music. Through a Marantz PM66-SE Ki amp and TDL RL72 speakers, I found listening to this one was guilt-free, all the way up to maximum. To be fair, the DA-7000 is more efficient than the DA-7000; indeed, I found its laid-back character to be a refreshing change to the Hitachi’s. The remotely-controllable SL-P550 sold for £300 – twice the money that would have changed hands for a DA-7000. You get what you pay for...

Indeed the chance of partnering a DA-7000 with even upper-budget hi-fi like that listed above would, in all fairness, have been negligible. To the owner of a cheap rack, ghetto blaster or mid-fi,...

"our specimen was found inside the VCR compartment of a TV stand abandoned by a local auction room"

Today, switch-mode power supplies are the rule as they’re cheaper and more efficient. In contrast the DA-7000 relies on a conventional (and easier to repair) ‘linear’ supply, fed by a frame transformer at left.

Only the most basic functionality graces the DA-7000. No provision has been made for remote-control, the user having to press front-panel buttons instead. Two seven-segment LEDs visually-confirm the track currently being played.
Salisbury not-so-plain

Martin Pipe falls in love with the gem that is Naim’s Uniti Atom ‘Headphone Edition’

Way back in the mists of time (OK then, 2009) Naim launched its original Uniti ‘all-in-one’. A ‘music centre’ for the 2010s, it combined FM/DAB/Internet radio, DLNA/uPnP-ready streaming client, USB playback, an interface for the-then de rigeur iPod, amplifier and CD.

Today’s Unity ‘family’ – four models, plus a CD transport, look very different.

Streaming is now the Uniti’s raison d’etre. Tuners and phono stages have gone the way of the iPod interface. Bluetooth is now fitted and only one current Uniti – the full-width Star – has slot-loading CD built in.

It’s assumed that Atom buyers, including those choosing the Headphone Edition I am reviewing here, will be getting their music from streaming services – Tidal, Spotify Connect and Internet radio (including Naim Radio, craftily stored as a ‘preset’ on the review sample). Google’s Chromecast is built-in, for app-based access to services like Deezer, Qobuz, Plex, Tuneln, Soundcloud and Pandora.
The top panel contains the specially-made volume control unit – a backlit rotary-encoder. Naim built the Atom HE’s power supply around the large toroidal transformer that dominates the main enclosure. No switch-mode supply here.

via a smartphone or tablet. Airplay is supported for iTunes and Apple devices, while the Bluetooth section supports aptX HD for “high definition quality” from compatible devices.

Like the original Unity, the Atoms offer uPnP/DLNA-ready networked-audio clients, albeit more responsive and capable ones, as befits ten years of technical progress. I, along with many others, use uPnP technology to facilitate NAS (Network Attached Storage) music libraries that can be accessed from multiple players around the house. I have for a long time been a fan of this concept, as it makes your entire music collection speedily-accessible – no more records or CDs to track down! Use programs like Exact Audio Copy to ‘rip’ CDs for upload to your NAS, and you’ll get by without a Core.

All Unity models will handle hi-res in lossless FLAC/ALAC, WAV or DSD (64/128) form. In addition to lossless CD-resolution material (I use FLAC), lossy codecs like MP3, AAC and WMA can be played – indeed, these are essential for the Internet radio feature. Roon is supported if you’re using compatible gear, for a neater music-browsing experience.

Both Atoms are supplied with an RF (not infra-red) remote. This elegant black slab lets you select sources, sequence through favourite preset radio stations, control volume (complete with white-LED level indication), skip tracks in either direction and adjust display brightness. There’s also a multiroom feature, should you be fortunate to have other Uniti hardware around the house. To make the most of Naim’s platform, though, you’ll need the app. It’s needed to, for example, choose uPnP tracks for playback at other racenac stations as ‘favourites’ for speedy access.

As well as streamed sources are Internal USB playback (up to 20,000 tracks per storage device, Naim tells us!), a single line-level analogue input (an external phono stage is needed for vinyl) and three digital inputs, two of which are optical. To one of these could be attached an existing CD player.

The first Atom variant, launched in 2018, was designed for use with speakers, incorporating a 40 Watts per channel amplifier. The second model, featured here, is the £2,699 ‘Headphone Edition’ (HE). Although the original Atom has a simple headphone amp with 3.5mm socket, the HE goes to town when it comes to ‘canned listening’. At the expense of the speaker-level amps and HDMI connectivity, you get the ability to drive rca fewer than three pairs of headphones – simultaneously, if need be.

On the front are 6.3mm (unbalanced) and 4.4mm (balanced) Pentaconn sockets, augmented by a rear-panel 4-pair XLR for balanced phones. However, Naim also allow the Atom HE to be used with active speakers and power amps – cr as a source for existing systems. In addition to ‘preamp output’ phono sockets with ground-lift switch, as also found on the ‘ampex’ model, is a pair of balanced XLRs. In other regards, though, the two Atoms are tc all intents
and purposes identical. Indeed, the same brief ‘Quick Start Guide’ seems to serve both models.

**USE AND PERFORMANCE**

For all its inner complexity, the Atom HE is easy to set up. Plug in, and let it ‘pair’ with the remote. A firmware update may be required. While this is proceeding, install the Naim app. This ‘seeks out’ compatible players on your network (as supplied, Uniti products automatically-adapt themselves to work with the latter). Once the Atom HE has been found, it can be configured to suit individual circumstances. There’s Bluetooth and the Chromecast feature allows compatible apps to route audio, without lossy compression, to the Atom HE via the network. Just as simple to select are the various external inputs, or the streaming services directly-supported by the unit.

It’s also easy to go through folders on a network (or USB devices) for tracks to play. Entering the folder and clicking on a track plays it; however, it’s also possible to highlight the folder and play its entire contents in sequence. Artwork and track information is displayed on the highly-readable 5in. colour screen.

I used the Atom HE with a pair of Focal Utopia headphones – quite apt, given that the French firm is owned by Naim’s parent company and Focal’s transducers are recommenced by Naim. The unit also happily drove Meze Audio’s Empyrean, another superb example of high-end headwear that happens to share the Atom HE’s price tag.

The balanced line output was used to feed a pair of professional-use Adam Audio AS6, active rearfield monitors with revealing ribbon tweeters. After plugging in headphones, the external output is automatically-muted and the volume charged to the last-used ‘headphone’ level. Unplug them, and it reverts to the previously-set line-level. Naim has also provided a front-panel headphone ‘override’ button, for manually-toggleing between the two mocs.

**SOUND QUALITY**

With the Utopias, the first thing I noticed was exquisite levels of detailing that helped draw me into the music. This worked with well-reconciled orchestral music, such as my hi-res LSO/Noseda recording of Britten’s complex War Requiem, as it becomes easier to pick out individual performers. The tonal colour of their instruments (or, in this case, choral voices) was easier to distinguish within the mix. Analytical, yes, but musically-convincing too.

The Naim also proved to be effective with layered rock music. With Fitter Happier, from Radiohead’s OK Computer? this atmospheric musique concrète-ish piece consists of an Apple Mac-generated voice accompanied by treated piano, effects and other weirdness. Also in there is some spoken word; such was the resolving power of the Atom HE/Utopia combo that it was intelligible, instead of blurring with the other elements.

Historically, Naim products (notably amplification) are famous for their musicality, and their timing. And so it was with the Atom HE. Percussive material like electronic and carce music – Kraftwerk’s Tour de France Soundtracks, for instance – was
Due to lack of space, Naim put the 4-pin XLR balanced headphone output on the rear panel, alongside the unbalanced and balanced pre-amp outputs, provision for a single unbalanced line-level source and three digital inputs. There's also another USB, and an Ethernet alternative to the onboard Wi-Fi.

Carried with rhythmic snap and immediacy. You get the excitement as was intended by the artists, but in no way is it exaggerated — something that can lead to listening fatigue. Percussive dexterity can be confused with a mid treble boost, which emphasises snares and hi-hats, but the Atom HE is tonally-neutral.

At the other end of the scale bass lines, whether strung or electronic, were satisfyingly deep yet correctly proportioned. The latter weren't particularly evident with the smallish Adam A5 active speakers, which are best used with a subwoofer, but the musicality and impeccable timing were.

**CONCLUSION**

There are minor gripes — you can't kill the lighting for late-night listening, and more attention should be paid to front-panel usage (a touch-screen, for example) — but on the whole, the Uniti Atom Headphone Edition is quite an achievement. With headphones, or a power amp and speakers of suitable quality, it offers an enjoyable yet clutter-free listening experience from today's digital media.

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**MEASURED PERFORMANCE**

The Uniti Atom Headphone Edition is at heart a digital device with digital inputs that feed the analogue headphone and line outputs through an internal DAC. That means the analogue line inputs go through an additional conversion process, via an ADC (analogue-to-digital converter).

Fed a 192kHz sample rate digital signal via the electrical S/PDIF input, frequency response extended to 22kHz only, as our analysis shows, where 96kHz is possible. Naim are band-limited at around 22kHz in any case so this is consistent with their design approach, and also CD quality commercial music servers. Whilst the S/PDIF electrical input worked to 192kHz sample rate the optical did not, managing 96kHz; this input will fall silent if fed 192kHz sample rate PCM.

With distortion from a digital input of 0.09% at -60dB and EIAJ Dynamic Range of 106dB (both 24bit) results from the DAC are slightly better than CD, but not comparable with current top quality DACs. These results apply to all digital inputs except Bluetooth that has a different signal path and processing. Here distortion was high at around 0.28%, affected by noise, a dynamic range 100dB and frequency response curtailed to 1kHz. Again, Bluetooth can give better results than this.

With the analogue inputs frequency response reached 22kHz and distortion was low at 0.014% at high level, but with ADC and DAC in the path, distortion at -60dB rose to a high value of 0.35%.

Gain from analogue inputs to outputs (phone & XLR) was low at x1.7, with output max at 5V. Gain to the headphone output was x4 and the headphone socket (6.3mm) could swing a high 7V, enough for insensitive Planar Magnetic phones. The Uniti Atom Headphone Edition gives CD quality, matching CD quality from commercial music sources (Tidal etc). It does not offer hi-res. performance.

**NK**

**DIGITAL IN**

- Frequency response: 6Hz-22kHz
- Distortion (-60dB): 0.09%
- Separation: 91dB
- Output (headphone): 7V
- Noise: -103dB
- Dynamic Range (EIAJ): 106dB

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**Naim Audio**

Contact: 01722 426 600
Email: info@naimaudio.com
VINYL NEWS

VINYL NEWS

vinyl section

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FEBRUARY 2022  www.hi-fiworld.co.uk

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The Drifters' 'Under the Boardwalk' reviewed by Paul Rigby.

EFTERKLANG
The band's latest album, 'Windflowers' (City Slang; citysling.com) arrives on limited clear vinyl and includes a lyric sheet. Been a while since I listened to this band and maybe I'm off base here but their style seems to have evolved a fair bit – in a good way. 'Alien Arms' is a beautiful, pastoral ballad. 'Beautiful Eclipse' is a musing, day dream and 'Lady of the Rocks' is an electronica diary entry. Lovely stuff.

SOUP
Limited to 100 copies 'Visions' from Norwegian band Soup is presented on marble blue vinyl and within a shiny "Holographic rainbow laminate" gatefold sleeve. Adding a 16-page photo booklet and single-piece art work, this is a concept piece of Norwegian prog. It's grand approach, uplifting set pieces are never afraid to hang off an epic hook for a long, long time. Nor is this album afraid to hit either side of the dynamic range. There's ballads, there's grandeur; there's complexity. I love it.

PIXIES
Thirty years? Blimey, time do fly. The 30th anniversary of 1991's Pixies' 'Trompe Le Monde' (4AD; 4ad.com), is essentially a Black Francis solo work that combines many of the best facets of the group's earlier works and adds some useful ballads to boot. Kim Deal's increasing song-writing chops were rewarded by the good lady being wholly marginalised by Francis here. Nice. The band would split after this one. Sacked by Frances by fax. Still, brilliant album.

P.O.D.
And don't forget the full stops. 'Satellite' (Atlantic) combines that metal, punk, rap et al, nu-metal mixture. Originally released in 2001 and reissued on two discs. This was and remains an album of inspiration and hope and an excuse for living. Something Tool and Korn were not delivering at the time.
**FIRST BOY ON THE MOON**
The self-titled album from this Swedish rock/pop combo (<firstboyonthemoon.bandcamp.com>) offers plenty of jaunty, mid to high-tempo, hook-laden, bouncy, arm-waving, skippy rock that will put a smile on your face. You’ll end up making your coffee to the rhythm of this album, you mark my words.

**HOO**
...release ‘We Shall Never Speak’ (<https://hoporatomrecords.bandcamp.com/album/we-shall-never-speak>). I’m sure I heard these tracks the last time I drove in the fog...a place where you see shadows of ghosts and echoes of your imagination. The band call it space rock or krautrock but it’s too woozy for either. This is the music you hear when you’ve been doped by that person you’ve just met, as they riffl through your pockets for your credit cards.

**GOV’T MULE**
This bluesy, hard rockin’, grizzled jam band is back. We’re going blues covers and blues originals on this one. ‘Heavy Load Blues’ arrives as a double album gatefold (Fantasy; <fantasysterecordings.com>) looks back to Elmore James, Junior Wells, Howlin’ Wolf and more. This is blues, weighed heavy with emotion, with slow application, scratchy guitars and smoky Hammond organs. It’s packed with emotion, the sort that accumulates like mud on an old tyre.

**JARVIS COCKER**
‘Chansons d’Ennui Tip-Top’ is the man’s first solo LP in twelve years. Using the Wes Anderson film, ‘The French Dispatch’ as inspiration, it offers covers of a dozen French classics. Cocker is well suited to the melodrama emanating from much of this material. I’m not sure if I can take Cocker’s breathy, faux French seriously, though. Because I’m not convinced he is. Oh, Stereolab fans, look out for Laetitia Sadier on ‘Paroles Paroles’.

**SCHOOL OF ROCK**

**WATERBOYS**
A reissue of the 1990 album, ‘Room to Roam’, and spread over two discs within a gatefold. This release has had the full treatment, though. Abbey Road has been all over this one, giving it the half-speed treatment. You need to play it at 45rpm too. The upshot is a boost in sound quality.
As for the album itself... It takes a step back from the magnificence and Big Music of the likes of ‘The Whole of the Moon’ and comes over all introspective, introverted and self-absorbed with a scoop of the Celtic in approach. There’s a folkish atmosphere on this one.

**POPpy ACKROYD**
Ackroyd messes with instrument’s heads. Sure she plays violin and piano but this London-born, Brighton-based composer, throws in the odd drumstick with them, attacked them with picks, scrapes them with her fingers... She plays instruments like some people do gardening. On ‘Pause’ (One Little Independent; <www.olirecords.com>), a neo-classical outing, Ackroyd is gentle, caring, attentive, sometimes hesitant, always loving towards the music itself.

**MANDOKI SOULMATES**
László “Leslie” Mándoki, a German-Hungarian musician, has a new double album out called ‘Utopia for Realists’ (Inside Out). As a producer, the man is connected. It looks like he’s called in some favours here too because this jazz-rock album features names. Lots of names: Ian Anderson, Jack Bruce, Midge Ure, Nik Kershaw (!), Al Di Meola, Eric Burdon and many more.
The music wanders from soft rock to harder jazz to jazz-prog. It’s a night of journey. More so as many musicians had to phone in their music from remote locations.
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Entry issue

Will the £135 Lenco LS-55 turntable give you a decent entry to vinyl replay? Noel Keywood thinks not.

So you have CD or a streamer, or hundreds of music files on the phone. You are a thoroughly modern listener, not at all interested – even wary of – the vinyl LP. All that religion and a stylus that will self destruct at glass of wine No 3. Would a turntable like the Lenco LS-55 I’m looking at here, price just £135, be a good entry point? The answer is “no”. Here are the reasons why, so you know what to expect at this end of the market and what you should buy instead, for yourself or others.

Down to the nitty gritty. Read the literature as we did and no tracking force for the cartridge is stated. Our limit, for the safety of
our LPs, is 3gms: the Lenco came in at 4.5gms when measured. That ruled out the use of valuable test discs, as well as our high quality review LPs, to avoid damaging their grooves. We used sacrificial LPs instead.

What the literature carefully avoids mentioning is that a ceramic cartridge is fitted, not a hi-fi moving magnet (MM) type. It clips into the arm and cannot be upgraded to something better with standard 1/2in fixing centres. And since there is no way of adjusting down force of the arm, there’s no point in any case!

A little bit of time spent on the ‘net showed a wide range of budget turntables using this non-adjustable arm and cartridge combination. Looks like it is coming from one source, the Dongguan Ang Chung Electronic Technology Co (China) is quoted.

Replacement styli for the cartridge come from many suppliers it seems, two costing £14.69 on Amazon for example. Styli are sapphire, downforce is 5gm, with a range of 4-6gms, but you will rarely see this quoted. You get what you’re given here. There are no options for improvement. See our box-out on Ceramic Cartridges for more detail.

Alternatives? For £279 Lenco offer the L-3808 Direct Drive that is far above the LS-55 in ability. The LS-55 has an impressive range of features and ability at a ridiculously low price. Moreover, it looks and feels good in the flesh, even if the arm and platter don’t bear close inspection. It is a three-speed (33, 45, 78rpm) belt drive with auto-start at arm lift and optional auto-stop (but not lift). There’s an onboard stereo amplifier rated at 5W per channel, with small loudspeakers on the plinth’s underside. With a well built wooden plinth sitting on solid legs, the volume control is easy to use and it does not upset play, the plinth and arm sitting on a spring isolation system. Nice hinged dust cover too.

At rear lies an Aux input (3.5mm socket) to plug in other

"There are many other low cost turntable packages out there that use the same arm/cartridge assembly: beware of them all".

A light aluminium arm tube with flexible plastic headshell, carrying a clip-on ceramic cartridge. Tracking force nominally 5gm and not adjustable. Upgrade is not possible.
devices. Also, there is an input socket for the external 9V power supply, making this turntable safe for children as there are no high voltages.

The “phonograph” will record to a USB memory stick (flash drive) in MP3/WMA compressed formats, and recordings can be played from USB too. There is a Bluetooth transmitter to send LP sound to outside devices, like similarly equipped headphones. Also, there are audio output phone sockets.

Spinning Everybody Hold Still from the delightful Grace Jones (Living My Life) brought forth a very tinny sound with strong high treble but little bass. Measurement showed bass was -20dB below the small loudspeakers, showing just how unbalanced the sound was. It’s not a cost issue since getting equalisation right (it’s not RIAA) would simply be a matter of altering a few component values (there was plenty of spare gain); the amplifier stages are just poorly designed.

Speed accuracy was good, but speed stability mediocre, warbling and drunkeness being obvious on a test tone (W&F=0.4%).

So there you are. This budget turntable offers a lot and looks good. It even has auto-power off with a spoken warning that took me by surprise; there’s a woman in the house, where’s the hiding? Under the turntable!

But sound quality was poor; poorer than it need be even at the price. A bit of EQ would have helped put some body in the sound. And 4.5gm downforce from the cartridge is going to wear out LPs.

This makes the LS-55 not a good way to enter the realm of vinyl replay. There are many other low cost turntable packages out there that use the same arm/cartridge assembly, possibly all made by the same company. So beware of them all. This is not hi-fi, it is budget audio – and differences are large our measurements show.

Such turntables, including the LS-55, are a poor choice as entry to LP for the old or the young. Don’t buy grandad one of these to remind him of old times, nor your young daughter to hear Taylor Swift. Far better is available for little more, in Lenco’s own wide range and from others. As a rule of thumb, if it costs less than £200 you have not got a bargain, but something with poor sound that will mistrack and damage LPs.

**CERAMIC CARTRIDGE**

The ceramic cartridge is a nightmare from the past, that isn’t hi-fi, so much as basic audio. And that was its status back in the 1960s when fitted to record players. Not a lot has changed.

This type of cartridge uses two small piezo-electric transducers to produce relatively high output. Trouble is they are incompetent so prevent the stylus moving easily in the groove. To stop it jumping out high tracking force is required, around 5gm, and even then tracking is poor, meaning these things damage and wear out LPs.

Ceramic cartridges can be recognised by the small plastic bridge that cradles the cantilever, connecting it to the piezo-electric sensors. Higher quality moving-magnet (MM) cartridges lack this. Back in the 1960s the popular Acos ceramic cartridge had a distinctive flip-over microgroove/78 tip option, but today’s ceramics lack this, probably because 78s are not in common use. A microgroove stylus is too small for 78s.

Because ceramic cartridges don’t use a magnet and a coil of wire to produce a signal their output does not match that of the cutting lathe used to produce an LP, meaning the sound balance is incorrect. They do not suit RIAA equalisation of phono stages and their high output can overload them, so are commonly run straight into an amplifier. But they still need equalisation, without it giving a thin, bright sound from LP by approximately reproducing its RIAA pre-equalised sound balance that boosts treble and cuts bass. All a bit of an ad-hoc mess in engineering terms but this is what to expect from a ceramic cartridge. You get sound – but that’s about all.

**LENCO LS-55**

£135

**VALUE** - keenly priced

**VERDICT**

Bright thin sound, due to lack of electrical equalisation. Unpleasant.

**FOR**

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- facilities
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**AGAINST**

- scratchy sound
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*Reviews of the original Nucleus, which has the same technical performance of the 2019 revision but with a different look.
Back Tracks

Three books that look back — at Folk, at Madness, at The Police. All great reads, thinks Paul Rigby.

**THE ELECTRIC MUSE REVISITED**

When this book was initially published back in 1975 it chronicled just how folk had been modded, tweaked and thoroughly messed about with. To the enhancement of the genre as a whole, I reckon. That essential book remains here. The important chapters remain.

What you’ve got now is an updated form with Robin Denslow adding more text to bring the story up to date. And that is a story all on its own. The tale of folk hitting the skids, then rising again and then doing what most musical genres have tended to do during the more recent years, mixing with everything else to form a melange.

That is squeezed into around an additional 100 pages or so. So you get a précis of sorts but the essentials are there.

There’s a nice blend of ‘in the moment’ critique (Part I) together with ‘hindsight’ editorial giving two flavours within the same book. I’m glad Part I hasn’t been changed or updated. It offers a unique historical take on the genre at that important time. This book might not offer an ultimate history of folk but it’s an important reflection and opinion on the genre in all its forms and times.

**GROWING OUT OF IT**

Saxophonist and co-founder of the band Madness, Thompson’s book reminds me of Will Sergeant’s (Echo & The Bunnymen) first biography ‘Bunnyman’. Both linger on the early days. Sergeant’s ends in the late seventies. This volume ends in 1980.

Thompson extracts direct quotes from the other people involved in his reminiscences who often add valuable perspective. This is a delightful addition. It adds meat to the story.

We hear of Thompson’s traumatic time at the ‘Approved’ school in Chafford. Pupils (inmates) were taught in army barracks huts. Trust issues followed that experience.

We hear of early musical influences. Thompson living with his Uncle or in a convenient squat and socialising in youth clubs. The Madness roots kick in somewhere after page 100. Then we’re off into the madness of Madness.

Thompson does wonder if the band’s long life in the industry has been helped because Madness are never overly political. As many other groups were at the time. An intriguing thought.

This is a revealing, deeply personal book but also an excellent band memoir. Recommended.

**THE POLICE**

A sort of warts’n’all account of the band’s history. The ups and downs, the relationship breakdowns and the splits. But there’s plenty of core information for the fan here.

Big breath: I never knew Sting arrived to the band with a whopping great book of lyrics — just ready to go; the lads also pondered whether the group’s reggae outings demanded that Sting should affect a Jamaican accent (imagine); the drum part on the hit single “Message in a Bottle” was assembled from six different parts; organised by manager Miles Copeland, a New York prison photo-op was interrupted by a NY detective asking the prison staff “How does it feel locking up a bunch of white guys for a change?”; during a concert in Argentina an over-eager cop tried to grab and assault a female fan only to be kicked in the face by Andy Summers. The crowd went wild; the time Bill Oddie’s daughter scared the life out of her dad by opening the front door and declaring “Dad! It’s the Police!” It was only Andy looking to buy Oddie’s house.

So, yea. That kind of thing. Full of stories, full of events, full of being in a band like The Police. A cracking read.

**Title:** The Electric Muse Revisited: The Story of Folk into Rock and Beyond
**Authors:** Robert Shelton, Dave Laing, Karl Dallas and Robin Denslow
**Publisher:** Omnibus
**Price:** £18.99
**Pages:** 301

**Title:** Growing Out of It: Machinations Before Madness
**Author:** Lee Thompson
**Publisher:** Omnibus
**Price:** £16.99
**Pages:** 273

**Title:** The Police: The Adventures of Sting, Stewart and Andy
**Author:** Caroline & David Stafford
**Publisher:** Omnibus
**Price:** £20
**Pages:** 280
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**FREE READER CLASSIFIED ADVERT COPY DEADLINE**
**FOR FEBRUARY 2022 ISSUE 14TH JANUARY 2022**
There are few R&B groups out there that have had the impact on music and, by association, the pop charts as the Drifters. There are also few groups that have experienced so many ructions and changes.

When Dominoes lead singer, Clyde McPhatter left that group in the late forties, it was dedicated music fan and record collector Ahmet Ertegun who pursued and signed him up to his newly formed little publishing project that he liked to call Atlantic.

Ertegun encouraged McPhatter to start a group all of his own which McPhatter did — he called his new outfit, the Drifters... because apparently, the group’s members ‘drifted’ in to the new group from other collectives. And drift they did. McPhatter riffled though over a dozen friends before he settled on his chosen few.

When that first group was found, they released a single which didn’t do a lot. So that group was summarily dumped and a new outfit was created in its place under McPhatter. This one hit the spot and also No.1 in the charts with the song, ‘Money Honey’, a candidate (one of many) for the ‘first ever rock’n’roll record’.

The line ups continued to change, though. Then McPhatter himself left in 1954 for a solo career. David Baughn followed, then Bobby Hendricks, Johnny Moore, Charlie Thomas, Benjamin Earl Nelson who then changed his name to the more familiar Ben E. King, and Johnny Williams. Then the sixties hit and Rudy Lewis entered the fray. In addition to that, line up changes and management changes were happening with some gusto behind the scenes.

Nothing stayed the same when it came to being associated with the Drifters, it seemed.

This album, ‘Under the Boardwalk’, would be released after the ‘Our Biggest Hits’ release that also appeared in the same year, 1964. In fact, the two albums shared a track listing and a basic sleeve art design until the single ‘Under The Boardwalk’ hit the charts. This would be the band’s final Top 10 hit. So, in album terms, that track was in, the earlier song ‘Drip Drop’ was out and the sleeve art changed to note that tweak.

The release of this album remained a little muted though because the group had lost their lead singer of four years, Rudy Lewis. A marathon time for any group member, never mind a lead singer. It has been reported that Lewis was a gay man when the social mores of the time meant being gay was particularly tough on the individual. Hence, Lewis kept his sexual orientation to himself. He also reportedly suffered from an eating disorder and had issues with Heroin. Although the latter has been contested.

With the tragic loss of Lewis, Johnny Moore stepped back into the fray once more, as lead tenor. He would be the group’s longest lasting lead singer.

So what you get with this album is a strange mixture of tracks cut when Lewis was in the chair but Moore sang lead and other songs that were successful for the Lewis-lead group, such as ‘Up on the Roof’ and ‘On Broadway’.

Both singers share the spotlight spoils here and both do superbly well. Even the producer, Bert Berns did a magnificent job behind the desk, guiding the band through their final recording successes.

After this release, the group would suffer. Their own smooth, gentle soul sound would be trampled upon by a newer, harder brand of soul emanating from the likes of Otis Redding and Wilson Pickett. The Drifters found it hard to adjust.

They even suffered in the UK during the height of their US success because their own hit singles were covered by other UK artists which tended to take the glory away from the Drifters.

It wasn’t until the new breed of rock bands hit the charts in the mid sixties that the Drifters found a new swathe of recognition and respect. Drifters songs were covered by the Rolling Stones, the Moody Blues and Cliff Bennett, for example.

You can check out this album in a unique form via the new box set from Strawberry called ‘We Gotta Sing! The Soul Years 1962-1971’. A 3CD set found in a clamshell box, the collection presents a chronological list of all of the recording sessions the group recorded for the Atlantic label between 28 June 1962 and 5 January 1971. The set includes hours of interesting background information plus live up charges, credit information and more. PR
Introducing the XP-12 & XP-17

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