

KLH Ultimate One

Beryllium drivers, sustainable hardwood, real leathers, price – these debut open-back 'phones tick all the boxes. But do they offer the ultimate in sound quality?

Review: **Keith Howard & Christopher Breunig** Lab: **Keith Howard**

Mention beryllium and digit counters begin to whorl in the imagination. Unquestionably the very best metal from which to construct a headphone or loudspeaker diaphragm – because the speed of sound through it is over twice that of aluminium, magnesium or titanium – its use has historically been constrained for two reasons. First, beryllium is dangerous stuff to use in a manufacturing environment; and second, it's expensive. For proof of the latter look around you at, say, TAD's loudspeakers or Focal's Utopia [HFN Feb '17] and Stellia [HFN May '19] headphones. The Focals, both equipped with drivers having beryllium diaphragms, cost about £3500 and £2800 respectively.

So the arrival of the KLH Ultimate One is an eyebrow raiser for two reasons. One, it marks the unexpected renaissance of a famous audiophile name, albeit one best known for electrostatic speakers. And two, it uses 50mm 'pure beryllium' drivers while asking just £300 of you – not as a first payment on the never-never, but as the full cost of ownership.

SILVER SERVICE

Beryllium isn't the only costly feature that the Ultimate One boasts, either – its cable uses silver Litz conductors, with individually insulated silver strands. How does KLH do it at the price? Part of the answer must lie with the Ultimate One being made in China, although that is hardly unusual.

Construction of the Ultimate One is otherwise pretty conventional, with circular capsules having deep circular earpads with lambskin on the inner surfaces for comfort and cowhide externally for durability. The real wood earcups are

RIGHT: A mix of lambskin and cowhide for the earcups and headband, machined and polished ebony and black metalwork are all finished to a very high standard

available in either ebony, which KLH says is sustainable, or zebra wood. The latter costs extra and is available as a special order.

Comfort is pretty good. The headset weighs 349g (measured, 340g specified) which isn't featherweight but less than that of many audiophile headphones, planar magnetics in particular. The clamping force is low at 4.1N for a 150mm head width and the headband is sufficiently well padded not to chafe on the pate. What lets the side down a little – although the same can be said of countless other headphones – is the circular earpads that, although thick and squishy, are sufficiently small not just to

'As I listened to the piano sonata I uttered a silent "yes!"'

press against the earlobes: the tips of mine poked outside them. Having experienced a number of headphones recently that have ovoid earpads to accommodate the outer ear more naturally, I find this pinna assault increasingly annoying.

On the face of it the Ultimate One might appear quite well adapted to use on the move. As well as being fairly light, it has capsules that rotate sufficiently for it to lie flat within the supplied zip-up hardshell case. A cloth drawstring carry bag is also provided should the case be too bulky. But this is another headphone that appears rather schizoid in this regard because its 2m cable, terminated in TRS mini-jack plugs at both ends, is manifestly too long for use on the hoof, just as it's shorter than ideal for use with a conventional hi-fi system (for which a screw-on sleeve adapter is provided to convert the input connector to a ¼in jack). Also, there's no mic or in-line remote control to enhance convenience when the headphones are used with a smartphone.

WELL DAMPED

Expecting all this and beryllium diaphragms for £300 may be a case of asking too much, of course, but I suspect many Ultimate One owners will swap out the supplied cable in frustration for something of more convenient length – either shorter or longer – but not with the standard cable's silver Litz conductors, which seems a shame.

One positive about the cable is that – despite a braided sheath – it does not generate high levels of capsule noise when it rubs against clothing or furniture. This may well have something to do with the Ultimate One's structure being well damped at high frequencies but there is evidence – subjective and objective – of headband



LEFT: Swivel yokes and ample ratchet lock headband adjustment is provided. A 2m silver litz cable with ¼in adapter attaches to left earcup. Not shown is compact zipped carry case

substantially unaffected by a compromised earpad seal, and those that are sensitive to it. Of recently measured open-backs the Quad ERA-1 [HFN Aug '18], Meze Empyrean [HFN Dec '18] and HiFiMan Arya [HFN Aug '19] are all in the first group, whereas the MrSpeakers Ether 2 [HFN Jul '19] and the Ultimate One fall into the latter. The Ultimate One is a good deal less sensitive to leakage past spectacles or though hair than the Ether 2, but its bass/lower-mid tonal balance may nonetheless change from user to user.

TRAIN OF THOUGHT

The first thing I discovered when donning the Ultimate Ones [writes CB] was, due to their low clamping force, they tended to slide forwards (or off) if I looked down – eg, standing up to change a disc. No means a deal-breaker, but something to remember. But on to the listening! For high-res files I used a Mytek Brooklyn DAC/amp [HFN Aug '17] with my Macbook Pro running Audirvana 3.5 software, while for analogue tests a Beyerdynamic A2 headphone amp [HFN Sep '17] was pressed into service.

Prompted by letters in last month's Sound Off pages from our railway enthusiast readers, I dug out my old ASV Transacord LP, *Rhythms Of Steam* [ATR 7033], made by Peter Handford in the late '50s. Night-time freight trains recorded near Newark trundled through my head from right to left, the first of them presented in such a way that I almost felt I could stretch out an arm and touch it. Then a struggling second passed in the other direction, closer and taking its time, sounding very much 'in the head'.

From bygone realities to even earlier fiction, and Alan Bennett reading from AA Milne's *House At Pooh Corner* [BBC Records' REC 493; mono]. The voice was rather thickened with the Ultimate Ones and expressive nuances in the narration consequently dulled a little, although diction was clear enough. With stereo and Kate Bush's track 'Hounds Of Love' [*The Whole Story*; EMIKBTV 1] the Ultimate Ones darkened the vocal colour for which Bush opts and the low register accompaniments had more of a thump, but the overall presentation was musical and engaging.

The Schubert *Impromptus* which András Schiff plays on his c.1820 fortepiano [ECM 4817252; 96kHz/24-bit – see p94], with its extraordinary 'as new' quality, unfolded

resonance at lower frequencies. This is at sufficiently low level that there's no obvious coloration of pink noise played over one capsule only, but some carry-over of sound towards the inactive capsule can still be heard. Measurement confirms that the headband does resonate at low frequencies, most obviously when it is lifted off the artificial head. The dip in response

at 60Hz appears to be associated with one of these resonances, as does the response glitch just above 1kHz.

Arguably more serious in practice is that the Ultimate One is slightly sensitive to the integrity of its earpad seal [see Lab Report, p71]. This is normal for closed-back designs but open-backs like the KLH tend to form two distinct groups: those that are

KLOSS AND KLIPSCH

Audio engineer and entrepreneur Henry Kloss joined forces with Malcolm S Low and Josef Anton Hoffmann to form the Cambridge, Massachusetts, company KLH Research & Development in 1957. With a 500-strong workforce it was soon shipping 30,000 speakers a year across six continents. Key models were the Model Eight 'high-selectivity' radio, Model Nine full-range electrostatic speaker – developed in conjunction with Arthur Janszen – a solid-state portable record player and the first reel-to-reel recorder to feature Dolby noise reduction. KLH was purchased in 2017 by Klipsch/Vox executive David P Kelley and relocated to Indiana. Following Kloss's original concept, CEO Kelley's aim is to build world-class loudspeakers and electronics at affordable prices, starting with a range of bookshelf and home theatre designs and Model Eight and Nine updates. The Ultimate One headphones were launched at the 2019 MTV Movie & TV Awards, Santa Monica, alongside a Bluetooth in-ear wireless version, the Ultimate Two. CB

LAB REPORT

KLH ULTIMATE ONE



ABOVE: While soft and comfortable for most users, some may find those earcups a little too limited in internal volume. Overall this is not a heavy headset

with a combination of simplicity and sophistication which the Ultimate Ones' revealing qualities served handsomely. The rippling start to D899 No 2 certainly grabs attention with these headphones.

My one reservation concerning Steven Osborne's Hyperion recording of Beethoven's last piano sonata, Op. 111 [CDA68219; review next month], is about the metallic timbre of his close-mic'd Steinway. The Ultimate Ones did this no favours and it was a relief to turn instead to the Till Fellner live version on ECM [481 6837]. The lucidity of his counterpoint playing is an absolute joy and with the Ultimate Ones I just sat through the complete performance uttering a silent 'yes!' along the way at what he did.

ORCHESTRAL COLOUR

In 1982, producer John McClure made a lush-sounding programme *Aisle Seat – Great Film Music* with John Williams conducting the Boston Pops Orchestra [Philips 65 14 328; digital LP]. As the music segued from the climax of the *E.T.* 'Flying Theme' into the main theme by Vangelis for *Chariots Of Fire* you could hear where everything was coming from, and the track's rhythmic appeal was well presented by the Ultimate Ones. Again the soundstage was contained within the head, a likeable characteristic of these 'phones.

DG's producer for Seiji Ozawa's Ravel series from the mid '70s was the great Thomas Mowray. Rifling through my box set [2740 120], I selected the atmospheric *Alborada del Gracioso* orchestration, and while there was some thickening

of textures at full level, this didn't prevent my marvelling at Ravel's use of orchestral colour. Cymbals possessed a sheen, there was a mournful solo bassoon in the middle section, a soaring of woodwinds like birds in flight, and castanets... Moreover, low strings and percussion confirmed the Ultimate Ones' adroitness with subtle dynamic and spatial detail, while showing off a bright, clean treble.

To bring the listening to a stirring, if sinister, orchestral conclusion I turned to Sir Andrew Davis's new Chandos recording of Berlioz's *Symphonie Fantastique* with his Toronto SO [CHSA5239; 96kHz/24-bit], where the church bells in the finale are evidently real.

The Ultimate Ones exactly pinpointed their position in the soundstage, while the low-register rhythmic patterns and bass drum near the ending (also in sharp focus) had a vivid insistence – in contrast to the shimmering upper strings opening with harps in 'Le Bal'. These were rendered with exquisite transparency, along with real weight to the double-basses – superb! 🎧

HI-FI NEWS VERDICT

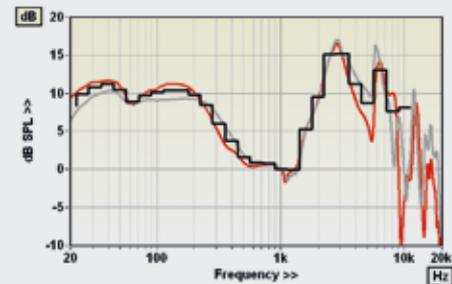
These debut headphones offer excellent value for money. Finish is superb, the styling familiar and not all listeners will be bothered by that low head clamping effect that can cause the 'phones to slide forwards. Sonically they offer a detailed treble and consistent 'in the head' presentation. Bass may be influenced by the user's hair or spectacles but the One's insightful and engaging sound will surely win out.

Sound Quality: 85%

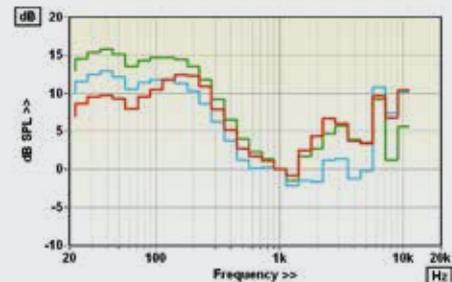


Inevitably the central question for the Ultimate One is: does it really behave like an upmarket beryllium-diaphragm headphone when it costs a tenth the price? Starting with sensitivity, it's a little below average. KLH claims 97dB for 1mW, which corresponds to 111.9dB for 1V across the nominal 32ohm impedance. We measured a little less than this – 109.4dB at 1kHz, averaged for the two capsules – which is roughly 6dB lower than typical for a modern moving-coil 'phone. However, impedance is a little higher than specified, the left capsule having a minimum of 33.8ohm and a maximum of 38.7ohm across the audible range – a variation sufficient to cause only small changes in frequency response of 0.25dB for a preamp with a 10ohm source impedance, or 0.53dB via a 30ohm source.

Uncorrected frequency responses for the two capsules [see Graph 1, below] indicate an obviously shelved-up but well extended bass, and more energy than typically seen immediately above the familiar 3kHz peak. In the diffuse-field corrected response [green trace, Graph 2], which more closely matches perceived frequency response, these features result in a distinctly shelved-up bass and upper treble. Normally this could be expected to result in something of a 'boom and tizz' tonal balance but the fact that the Ultimate One is sensitive to the quality of its earpad seal, losing a chunk of bass output if the seal is compromised by, for example, hair or spectacles [see Investigation, *HFN* Aug '19], suggests that many users will experience less bass emphasis than the graphs suggest. But this will be hit or miss, varying between users. The point of using a beryllium diaphragm, of course, is that its superior stiffness should render it much less prone to breakup resonances. And indeed, the Ultimate One's CSD waterfall (not shown) is unusually clean except for a high-Q mode at around 6kHz. KH



ABOVE: The Ultimate One's unequalised responses (L/R, grey/red; averaged 3rd-octave, black) show a strong bass [see below] and presence band output



ABOVE: Third-octave freq. resp. (red = Harman corrected; cyan = FF corrected; green = DF corrected)

HI-FI NEWS SPECIFICATIONS

Sensitivity (SPL at 1kHz for 1Vrms input)	109.4dB
Impedance modulus min/max (20Hz-20kHz)	33.8ohm @ 1.0kHz 38.7ohm @ 39Hz
Capsule matching (40Hz-10kHz)	±12.6dB
LF extension (-6dB ref. 200Hz)	<20Hz
Distortion 100Hz/1kHz (for 90dB SPL)	0.4% / <0.1%
Weight (headset only)	349g