

## HiFiMAN HE1000 planar magnetic headphone

by Chris Martens

**T**he Chinese firm HiFiMAN has been developing high-performance headphones for many years. Over time, HiFiMAN headphones have won a reputation for methodically pushing the limits of planar magnetic technology both in technical and sonic terms, and nowhere is this trend more apparent than in HiFiMAN's eagerly awaited new flagship, the HE1000 headphone (£2,549).

Through conversations with HiFiMAN founder Dr Fang Bian over the years, I have discovered the man possesses a certain restlessness of imagination, which leads him always to think of ways to revise, re-imagine, improve, and enhance even his most accomplished products. More importantly, Dr Bian cares deeply about the various elements that together comprise sound quality, so that he regards design not purely as a technical exercise but as a means of expressing a sincere passion for music. HiFiMAN's intent in creating the HE1000, then, was not just to offer a worthy new flagship, but also to build the finest headphone in the world.

With those lofty goals in mind, the HE1000 incorporates a number of groundbreaking technical advancements and design refinements. Perhaps the area where this is most evident is in the HE1000's planar magnetic driver.

The HE1000 driver is said to be the first in the world to use a diaphragm made of 'nanometre thickness' material (a material so thin, says HiFiMAN, that if turned on edge it would "be invisible to the naked eye"). The idea, of course, is that this ultra-thin diaphragm reduces the driver's moving mass, thus allowing greater transient speed, superior resolution of low-level details, and lower overall distortion. So important is this new diaphragm material that HiFiMAN considers it the "cornerstone of (the HE1000's) remarkable sound."

But the driver's advancements go further still. For example, the HE1000 driver assembly is now oblong rather than circular in shape, a design choice that I suspect helps to spread out and minimise the effects of any resonant modes that might be present. Moreover, the driver uses a new double-sided, asymmetrical magnetic circuit said to offer "the optimum balance between high driver efficiency and

high sound quality." As proof of this, the HE1000 carries an efficiency rating of 90dB/mW—much higher than that of past HiFiMAN flagship models.

To further increase openness and transparency, HiFiMAN has given the HE1000's open-back ear cup enclosures a new, patented 'Window Shade' system to protect the drivers. The 'Window Shade' system consists of a metal grille plate that provides a set of strong, but extremely widely spaced protective ribs that guard the drivers while offering an absolute minimum of resistance to back wave radiation from the diaphragms. HiFiMAN claims this grille system, "keeps the sound waves from second refraction(s) to avoid unwanted vibration and distortion," thus improving sound staging and imaging and increasing overall clarity.

In my experience, the system proved very effective at creating a free-flowing, non-restrictive operating environment for the HE1000's drivers. In fact, when I put the headphones on, the 'Window Shade' grilles offered so little restriction that the sensation was nearly that of wearing a set of empty headphone shells with no drivers inside—meaning I could hear virtually everything going on in the room outside (HVAC noises, household sounds, etc.). As an experiment I tried partially blocking the 'Window Shade' grilles with my hand and immediately detected a sharp drop-off in clarity and sound quality. In short, the 'Window Shade' system is an important, integral part of the HE1000's high-definition sound.

In a welcome step forward, the HE1000 now features easy-to-use, plug-in-type signal cables as opposed to cables equipped with tricky screw-on-type fittings, as provided in past models. The HE1000 comes with three sets of high-quality signal cables that feature crystalline silver and crystalline copper conductors. Two sets of cables are meant for use with single-ended amplifiers, one terminated with a 6.35mm headphone plug, and the other with a 3.5mm mini-jack-type plug, plus one cable with a 4-pin XLR connector that is intended for use with balanced output amps.

The HE-1000 sports ergonomic touches galore, including oblong, ear-shaped ear cups said to provide a more natural, comfortable, and less confining fit, plus a set of bevelled ear



pads that are thicker toward their rear edges for superior comfort. The headphone also incorporates an all-new ergonomic industrial design developed by the firm Catalano Design, elements of which first appeared in HiFiMAN's recent HE560 and HE400i models, taken to the extreme. All visible metal parts receive brushed silver surface treatments, while the ear cups are wrapped in oiled-wood veneers; the headband strap is fashioned from a rich, brown suede-like material. In sum, the HE1000 is the most polished, refined looking, and comfortable headphone the firm has yet produced.

For my listening tests I drove the HE1000s with two superb headphone amplifiers (the AURALiC TAURUS MkII and the Moon 430HAD) and three excellent DACs (the AURALiC VEGA, the PS Audio DirectStream DAC, and the DAC section of the Moon). For comparison purposes, I listened to the HE1000 alongside three other flagship-class planar magnetic headphones: the Abyss AB-1266, the Audeze LCD-3, and the Oppo PM-1 with updated ear pads. My tests revealed several things.

First, the HE1000 sounds superb straight out of the box, but improves further still with additional run-in time (HiFiMAN recommends about 150 hours of run-in, which I provided). Though the before/after differences were fairly subtle, the run-in process takes an already excellent headphone and gives it a smidgeon more smoothness, nuance, and delicacy, plus the ability to dig even deeper into fine low-level sonic details (something at which the HE1000 excels from the outset).

Second, the HE1000 offers a smooth, even, and neutrally balanced frequency response curve—one that places it on a par with such acknowledged masters of accuracy as the critically acclaimed Sennheiser HD800 (but without the German headphone's tendency to sound stiff and analytical at times). In practice, this means the HE1000 treats music in an honest, even-handed, and accurate way, but without sounding clinical or austere in the process. As a result, this headphone draws out the naturally rich and vibrant tonal colours of fine recordings, while refraining from adding its own embellishments or euphonic colourations. ▶

▶ Listeners seeking distinctively flavoured headphones that tend to over-emphasise certain frequency bands or downplay others might initially be frustrated by the HE1000, because it's simply too honest to provide the variety of intentional colourations those customers might crave. On the other hand, listeners who approach recordings with open and enquiring minds—seeking only to hear a clear, complete, and candid rendition of the contents within—might find, as I did, that the HE1000 is their dream machine.

This headphone is as honest as the day is long, but it is not, as a general rule, 'brutally' honest. In other words, it will tell you in no uncertain terms what's going on in the recordings you choose, but it tends not to punish you should you decide to explore less than audiophile-grade material. For obvious reasons, this 'forthright-but-not-obnoxious' characteristic entails one of the most delicate balancing acts in all of high-end audio, and it is one of the HE1000's most desirable qualities.

Third, the HE1000 offers terrific openness, transparency, and very high levels of resolution, effortlessly capturing fine, low-level textural, transient, and ambient details in the music. Together, these qualities add up to a heightened quality of three-dimensionality—in several different senses of that term.

Where some headphones render individual musical notes in a stiff, mechanical, 'colour-by-numbers' way, the HE1000 instead presents them in a far more fluid, expressive, and sculpted manner. Through the HE1000, sounds and voices exhibit continually varying qualities of pitch, timbre, attack, sustain, and decay, in the process conveying their vitality, movement, directionality, and shape. This is one sense in which resolution makes the HE1000 a more three-dimensional performer.

But the HE1000 is also three-dimensional in the more traditional

sense of providing superb imaging and sound staging. While headphones handle imaging and sound staging differently than fine loudspeakers do, they can nevertheless produce soundstages of remarkable depth and width, complete with precise placement of human and instrumental voices upon those stages. So it is with the HE1000. Its sound stages stretch well beyond the confines of the listener's head, extending from the far right to the far left and covering every point in between. When you hear instruments through the HE1000, their sounds emanate from very specific locations and convey an almost uncanny sense of immediacy and presence, not to mention a believable sense of place. The HE1000 treats listeners to rare qualities of vividness, palpability, and musical intimacy that few other transducers can so effectively convey. When switching from the HE1000 to other headphones, I found it common to experience a brief burst of disappointment, as the switchover usually meant that the sound had 'gone flat'.

Last but not least, we come the matter of the HE1000's dynamics, which are spectacular in several different ways. First, the HIFIMAN makes child's play of large scale shifts in dynamic emphasis, as became apparent when I listened to violinist Mark O'Connor's *Fanfare for the Volunteer* [O'Connor/Mercurio/London Philharmonic Orchestra, Sony Classics]. In this piece, one often experiences passages where an orchestra is heard at full song in contrast to lighter, sprightlier ▶



*"This headphone is as honest as the day is long."*



▶ passages where O'Connor's violin becomes the centre of attention. The HE1000 easily takes these shifts in stride, powerfully gearing up for the big moments, but then sensitively throttling back down for the more intimate passages.

I also discovered, by listening to the raucous 'Black the Sky' from King's X's *Dogman* [Atlantic] at full-tilt volume levels, that the HE1000 can rock out with the best of them (while gleefully reproducing the thunderous power and depth of Doug Pinnick's 12-string bass guitar).

But the HE1000 can also tease out extremely subtle dynamic shifts in individual instrumental or vocal lines, thus encouraging listeners to follow multiple lines at once. On 'Book's Bossa' from The Jimmy Cobb Quartet's *Cobb's Corner* [Chesky, 96/24], for instance, the HiFiMAN showed a wealth of dynamic information in trumpeter Roy Hargrove's brilliant solos. As a result, I was treated to an up-close view as Hargrove deftly adjusted his embouchures to shape notes, or subtly used breath control to create delicate crescendos or decrescendos on the fly. The HE1000 tempted me to get lost in the sound of Hargrove's horn, but in fact it handled each of the instruments in the quartet with similar attention to dynamic expression—meaning that each musical line led a full and independent life of its own. When recordings are up to the task, the HE1000 offers intensely revealing views of dynamic interplays in the music.

Comparisons between the HE1000 and its top planar magnetic competitors showed all to be admirable performers, though the HE1000 unquestionably stood as 'first among equals' at the end of the day. Here's why. The HiFiMAN narrowly edged out the Abyss AB-1266 in terms of detailing and dynamics, while providing more evenly balanced frequency response and superior ergonomics. In those same areas, the HE1000 also handily outperformed the Audeze

LCD-3, while offering plainly superior transient speeds and agility, plus a lighter and more comfortable fit. Interestingly, the Oppo PM-1 sounded like a 'HE1000 Junior', but ultimately the HiFiMAN headphone prevailed through its superior speed, detailing, three-dimensionality, and bass extension.

But can the HE1000 also compete with the mighty Stax SR-009 electrostatic headphones? In a word, yes. My sense is that the HE1000 is on a par with the Stax in terms of speed, detailing, and transparency, but without—and this is important—the Stax's occasional tendency to overlay the music with a subtle touch of treble 'sheen' that makes small details stand out in almost exaggeratedly sharp relief. Add to this the fact that the HE1000 offers arguably superior dynamics, better and more incisive bass, and can be driven by conventional (rather than purpose-built electrostatic) headphone amplifiers, and I think we have a winner.

Overall, HiFiMAN's HE1000 does more musically significant things well than any other top-tier headphone I've yet heard, regardless of the driver technologies used. While the HE1000 is expensive, I would argue that it is fairly priced and worth every penny, given that best-of-breed products never come cheaply. Whether you are in the market or not, I encourage you to hear the HE1000, if only to learn what a top-class headphone can do for you and the music you love. +

## TECHNICAL SPECIFICATIONS

**Type:** Open-back, circumaural, planar magnetic driver

**Driver complement:** Planar magnetic driver with 'nanometre'-thickness diaphragm and double-sided asymmetrical magnet assembly.

**Accessories:** Presentation case, user-replaceable signal cable sets featuring crystalline copper and crystalline silver conductors (one cable set with a 4-pin XLR connector for use with balanced output amplifiers, one set with a 6.35mm headphone plug, and one set with a 3.5mm 'mini-jack' plug)

**Frequency response:** 8Hz – 65kHz

**Impedance:** 35 Ohms ± 3 Ohms

**Sensitivity:** 90dB

**Weight:** 480g

**Price:** £2,549, or \$2,999

**Manufacturer Information:** HiFiMAN

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