

Loudspeakers for the ears...

The Sennheiser HD800 headphones

by Alan Sircom



Sennheiser is one of the biggest names in headphones. And yet the company's last big move into high-grade headphone design was the Orpheus, and that's at least 10 years old. This has left the top-end of the headphone market open to rivals, at a time when – thanks to the iPod – headphone listening became cool once again.

That's all set to change with the launch of the HD800, the new top of the Sennheiser line. Unlike the Orpheus of the 1990s, this is no electrostatic design and as such does not require the large valve-based, fan-shaped energiser that the previous top of the tree demanded. That also means that the HD800 can shave something like £9,000 off the price tag of its decade-old predecessor.

The HD800 is a circum-aural design (meaning the headphones sit over your ears instead of gently crushing your pinnae) that look substantial, but extensive use of ABS materials instead of wood and metal mean they aren't as heavy as you might expect. Some have criticised this, even before the launch of the product; ABS being not as chic as metal – ABS being not as easy to dent or damage and doesn't vibrate in the audio band, either, of course. The use of ABS extends to the headband, although this is topped off with

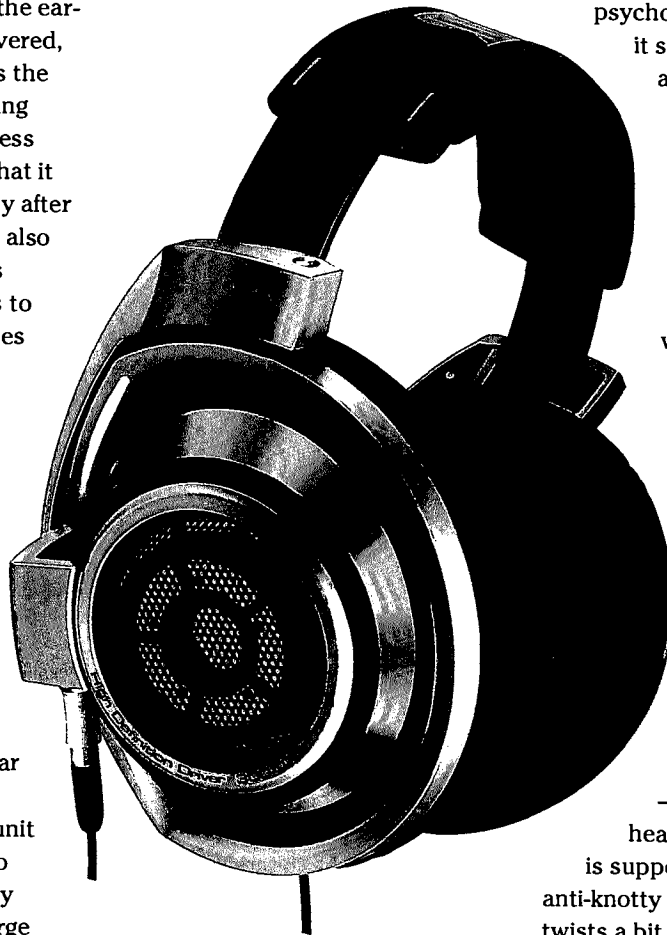
a metal plate with the serial number etched in and a soft fabric headband. The oversized D-shaped surround for the drive unit and rear-mounted attachment to the headband looks austere on paper but doesn't look too intrusive on the head. And it's damn comfortable too; you can sit and listen to these headphones for hours on end with no physical fatigue whatsoever.

Perhaps surprisingly, the ear-cups themselves are uncovered, and the housing that keeps the transducer away from prying fingers is made from stainless steel. Aside from the fact that it keeps your ears less sweaty after long periods listening, this also works for acoustic reasons (less coverings, less things to resonate) and aesthetic ones (sci-fi style). The ear pads that surround these cups are made from a classy microfibre fabric, although not the one originally specified (see below).

The single biggest change that separates the HD800 from all that went before is the unique ring transducer. Most headphones have something not too dissimilar from a tweeter acting as transducer. A single drive unit is problematic though – too small and you get frequency extension problems; too large and the surface of the transducer sets up its own inertial vibration mechanism. At the extremes, this makes the piston action of a drive unit turn chaotic. The way to resolve this in loudspeakers is to introduce a second drive unit (or more) to cope with the other frequencies. Unfortunately, that doesn't work when the drive units are about an inch from your ear,

because you hear the two acoustic centres of the drivers as two distinct entities.

Sennheiser spent many years thinking about this, and ended up with a toroidal – or ring – transducer. This manages to deliver the large wavefront sound desired by listeners (bigger, clearer sound that is more extended into treble and



bass) but without the aftershocks of transducer chaos. This in itself was only possible thanks to several years of materials science developments, to make a transducer material that was strong and rigid enough to cope with the job, but didn't sound like a scrunched-up packet of Kettle Chips in the process.

With a wide-bandwidth, high performance driver in tow, the way the headphone interacts with ears suddenly became possible to explore. Smaller transducers effectively point at your ear canals, but the HD800 drivers are angled, to give the appearance of sound hitting the ears as it would when listening to a pair of loudspeakers set in optimal position. This gives you a series of psychoacoustic clues to make it seem like there really are loudspeakers (more realistically, musicians) out in front of you, because sounds arrive at nerve endings in the middle ear slightly earlier than others.

The HD800 comes with three metres of cloth-wrapped, Kevlar-strengthened OFC balanced cable, featuring four individually Teflon-coated insulated wires, for connection to a headphone amplifier. It includes the standard ¼" jack, but no mini-jack – this ain't no iPod headphone. The cable is supposedly anti-twist, anti-knotty stuff – yeah, right. It twists a bit less than most plastic headphone cables (which seem intent on turning into a Gordian Knot three seconds after you rip open the box) and untangles easier than most, but there is no magic deknottifying technology here.

Of course, the HD800 is a truly hand-built affair. It will take time to get a pair, they are back ordered and each one takes several man-hours to build. No wonder the

▶ company put the serial number on the top of your head.

There was a two-fold aspect to this test. The first was an invite out to the Sennheiser factory, just outside of Hanover in Germany. The next was the test itself. The two were supposed to follow on relatively quickly, but a last-minute change in the ear surround material (the previous ultra-rare Japanese material was more prone to tearing than initially anticipated) and this meant a brief hiatus. This sent headphone fans on internet forums into complete apoplexy and started the conspiracy theories rolling. The boring truth is that no one died. No companies collapsed. No alien biowar interrupted the manufacturer. And no, the headbands do not cause giant pandas to suffer a loss of libido.

The HD800 is a serious piece of headphone gear. It demands use with a good headphone amplifier. Actually, make that a very good headphone amplifier... simply 'good' is not 'good enough' for this design. And no, that does not mean it's headphone amp fussy, just that when you hear how good the HD800 is, you get fussy instead. You will start demanding the best possible headphone amplifier, the best sources and everything else, because it's clearly and audibly rewarded.

Hi-fi writing is often filled with hyperbole, but sometimes that hyperbole reads like understatement to the reviewer, because the product is so damn good. That's how good the HD800 is – I could wax lyrical to life-threatening levels, with sickening prose about how wonderful this

product is, and not even scratch the surface. These products don't come along that often; the Focal Grande Utopia EM loudspeaker, the Berning Quadrature Z power amps and now add the Sennheiser HD800 headphones to the list.

Why? Because it tells you stuff about your discs that you never knew before. Even discs that might have been used time and again to ascertain the performance of products start to divulge secret bits of information lost in the back of the mix. One of the tests conducted at Sennheiser



was to compare the sound from headphones, near-field and full-tilt studio monitors, with a recording made a few minutes earlier and taken off the mixing desk. In particular, the engineer demonstrated the difference between two Lexicon reverb units – the PCM91 and latest PCM96. In listening through both speaker systems, the sound of the two reverbs were identical, but moving to the HD800, you could hear a slight 'pull' to the PCM91. It was as if the older reverb moved the singer fractionally to the side as the notes decayed. Of course, the only people who are likely to notice such subtlety are fellow HD800 users. The rest of the world

will be in blissful ignorance of the make and model of Lexicon used to mix vocals.

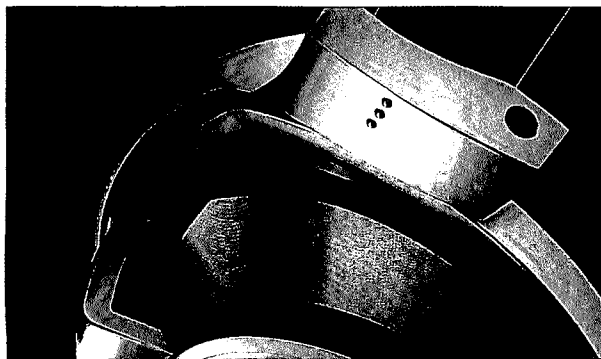
Whether it's stereo separation, detail, coherence, dynamic range or flat as a pancake frequency response, the HD800 has it in spades. In fact, it does these things so well, you'll struggle to find a pair of loudspeakers that does as good a job. Forget the money aspect – you will struggle to find any pair of loudspeakers that can do all of the things the HD800 can do. Granted a pair of headphones will not give you that

gut-punching bass that a pair of really big, really good loudspeakers can produce (on the other hand, with the £30,000+ you might save by not buying a pair of big loudspeakers, you can pay someone to come round and punch you in the stomach if you like that kind of thing). But for everything else there's the HD800.

Of course, things like soundstaging and imagery are harder to get right in a headphone, because it always sounds like the sounds are inside your head. Except for the HD800 that is. Thanks to those big, offset transducers, this headphone gives a passable sense of there being a group of instruments standing in space in front of your head, just like a good loudspeaker can. It's not as seamless as a pair of electrostatics or as pin-point precise and powerful as a pair of Wilsons or Magicos, but it comes surprisingly close.

But perhaps the big thing about these headphones is the sense of effortlessness they have. You can put almost any piece of music through them and nothing

▶ will cause them distress. Granted, some recordings prove to be not as good as you first thought – Gillian Welsh's *Time (The Revelator)* turns out to have a hardness and closed in presentation that you'd really struggle to hear elsewhere – but even this is due to the fact that the headphones always sound like they are cruising rather than panicking. Rodrigo Y Gabriela's percussive *palmas* opening to 'Tamacun' is a case in point – it's expressed so dynamically on the disc and through the HD800 it'll take your ears off if played at a fair lick, and yet the HD800 deals with the onslaught like it was nothing. Excellent stuff.



There's a significant limitation to the HD800. Two in fact... One either side of your head. The headroom of the Sennheiser HD800 is so wide that you will break your ears before you break the headphones. This is no small consideration, because a transducer so clean and so free from break up at high levels will make you push the envelope. It's almost irresistible, the "let's see what this baby can do" mind-set that gets Porsche owners their first speeding ticket within a mile of the showroom. In this case, you keep turning up the volume control until something starts to clip. That something is usually

the headphone amplifier. By which time you are in the world of potentially serious hearing damage at the very next transient. Fortunately, in most cases good sense prevails, but at the aforementioned German trip to the Sennheiser factory, there were a number of otherwise sober, dour and professional international audio journalists blissfully wiggling out to Pink Floyd at some quite ear-threatening levels.

There's only one last comparison to be made. We were fortunate enough to have a sample of the Sennheiser Orpheus on hand when comparing samples at the initial listening test in

Germany. The HD800 gets surprisingly close, but lacks the smoothness and even-handedness of the electrostatic design. That said, I'd happily trade the Orpheus'

smoothness for the level of information the HD800 gives you. As the HD800 is destined to be the start of a new high-end line for Sennheiser, perhaps there will be an even more up-scale version of this headphone with all the trimmings. Cor!

As it stands though, the Sennheiser HD800 leaves us with a very bold claim to make. This £1,000 headphone could be your next £25,000 loudspeaker. By that, I mean it has the sonic qualities of the very best loudspeakers, but without the footprint and the need to barricade yourself away from angry mobs if you plan on some late-night AC/DC at full blast.

In reality, most people who own a pair of £25,000+ loudspeakers would never contemplate going without them and moving to headphones, but where the HD800 score is that they do the other thing; they give you high-end loudspeaker sound for times when you can't play loudspeakers. And for that reason, the HD800 (and a good headphone amp) should be your next loudspeaker purchase. ▶

TECHNICAL SPECIFICATIONS

Sennheiser HD800

Type: Open, Dynamic headphones
Ear coupling: circum-aural
Transducer type: ring radiator
Frequency response:
 14Hz-44.1kHz (-3 dB)
Nominal impedance: 300 Ohms
Sound pressure level at 1 kHz: ...
 102dB (1kHz, 1 Vrms)
Max. nominal long-term input power: 500 mW
 (in acc. with EN 60-268-7)
Harmonic distortion: < 0.02%
 (1 kHz, 1 Vrms)
Contact pressure: ... c 3.4 N ± 0.3 N
Jack plug: 1/4" (6.3 mm) stereo
Connecting cable: 3m silver-plated,
 oxygen free (OFC) copper cable,
 symmetrical design
Operating temperature:
 -10 °C to + 55 °C
Approx. dimensions (WxHxD): ..
 273 x 348 x 149mm
Weight (without cable): ... 330 g
Price:£1,000

Manufacturer:
 Sennheiser
 Net: www.sennheiser.com

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