

DS Audio DS-W2

Replacing the inaugural DS-W1 while benefiting from a host of trickle-down tech from the brand's flagship Master 1, the new DS-W2 'optical' pick-up is firmly in the limelight
 Review: **Ken Kessler** Lab: **Paul Miller**

When I first heard about DS Audio's optical cartridges, I wrote them off as 'dreamware' unlikely to end up *chez* Kessler. As it turns out, the audio gods smiled on me and I have, to my surprise and delight, managed to review just about all of them, watching the series evolve while using the Master 1 as my reference. Now, with the DS-W2 selling for £9995 with the equaliser/phono stage, the brand is delivering nearly all the performance of its flagship at half the price.

In under five years, DS Audio has revived the optical cartridge – mooted decades ago but only viable now, thanks to LEDs and other developments – and cornered the market for such devices. They are as alien to moving-coils and moving-magnets as are oddities like Londons (*née* Decca), Grados and others that choose a different path, but even those involve magnets and coils. However, optical cartridges, by definition, are free of this iron and copper.

SILENT BACKGROUND

I pondered with editor PM his discovery that 'the response of the cartridge is free of the multitude of small HF resonances that afflict all MM and MC types'. Furthermore, with a DS Audio pick-up in one turntable and any others in another turntable, with the gain turned up full, A/B switching reveals that even the finest combinations of phono stages and MM or MC cartridges exhibit hum. The DSes? *Nada*. Silence. And this means retention of the one hugely desirable element of CD playback that none can deny: the blackest of backgrounds.

Thus the DSes are a tonic for those who are addicted to digital's silence. What it means for vinyl lovers, therefore, is that one gets to hear LPs with a whole layer of low-level *schmutz* banished into the aether. Says PM, 'I dealt with this in my Opinion page [*HFN* Nov '15] but it

RIGHT: The partnering 'phono stage' also includes a substantial low-noise PSU for the DS-W2 itself. It features a fully shielded transformer and 6x56,000µF reservoir caps per channel

could be the single most important factor in determining the "smoothness" and "blackness" of its sound'.

OPTICAL HISTORY

Starting with the debut model, the DS-001, that was released for sale only in Japan, the second model, the DS-W1 [*HFN* Nov '15], was the first to be offered for worldwide distribution. This was followed by the flagship Master 1 [*HFN* Dec '17] and entry-level DS-002 [*HFN* Jun '17] variants. The DS-W2 reviewed here is a direct replacement for the DS-W1, which was certainly no slouch.

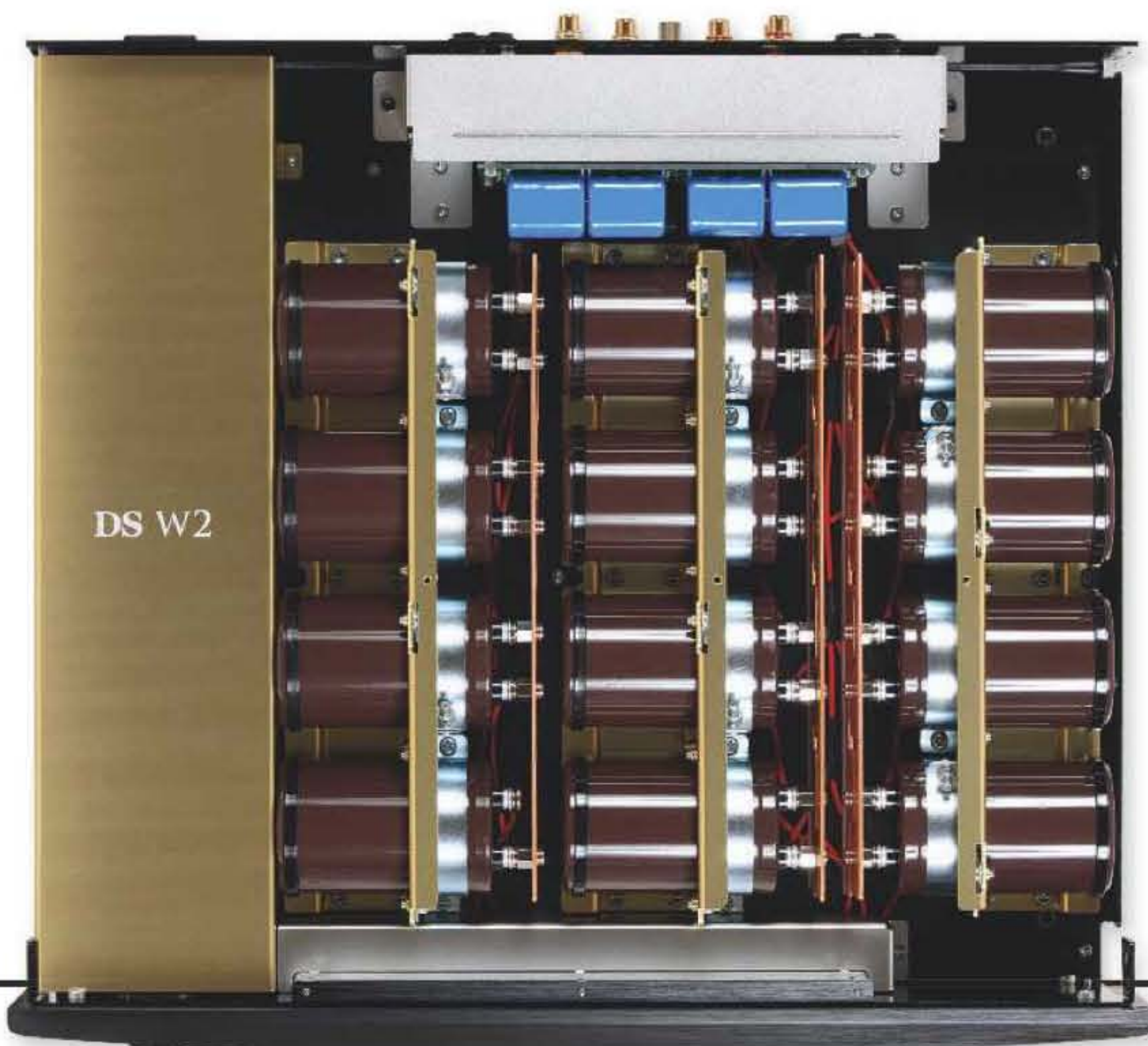
With the scarily-priced Master 1, the company incorporated an advanced optical-mechanical system which positions the micro-optic sensor closer to the stylus, extracting a more accurate

and detailed level of information from an LP. This has found its way into the DS-W2, along with the Master 1's wire-suspended cantilever, designed to lower the compliance and therefore enhance the DS-W2's compatibility with a wider range of tonearms. This compares to the DS-W1 needing a low-mass arm.

'The DS-W2 is a tonic for all who are addicted to digital's silence'

My only complaint in practical terms involves the body height of the aluminium shell. So while the boron cantilever with 'Micro Ridge' stylus is clearly visible and the rear pins are

colour-coded and well-spaced, the shallow profile of the DS-W2 causes problems with tapered arms and mildly-warped LPs. I'm devoted to the SME Series V, but its fatter back-end barely cleared 200g LPs with even the slightest of warps. I'd rather not stick a spacer between cartridge and





LEFT: The alloy body and top plate with threaded lugs ensures the DS-W2 can be bolted tight, though its shallow profile requires care in adjusting rear arm height. The Master 1's sapphire cantilever is replaced by a boron rod in this model

headshell, so a plea to DS Audio: can you please make the next models you produce 1mm or 2mm taller?

All DS Audio cartridges have lozenge-shaped bodies, differing in colour. This one is blackish, with a rose quartz LED indicator to show that it's on and operating. As with all of DS Audio's designs, the DS-W2 will not function with a conventional phono stage, but instead requires a separate, dedicated box that contains the light's power supply, and bespoke phono stage/equaliser. It is important when contemplating the cost of any DS Audio cartridge to keep reminding oneself that the sticker price also covers the massive 'black box' needed to run an optical cartridge.

While the DS cartridges can use any of the company's power supplies, the one included with the DS-W2 sounds so close

to the dearer unit that's provided with the Master 1 that it would take long sessions in the wee hours to hear the differences.

TURNING ON THE LIGHTS

It soon dawned on me, switching from the flagship Master 1 to the DS-W2 and using the Master 1's power supply, that DS Audio has made its life much harder by delivering so much at a lower price point. The basic character of both pick-ups is nearly identical, the performance as genetically similar as near-twins ought to be, and only audibly separated by their lower octaves.

Fearful as I am of appearing in Pseud's Corner, one analogy kept coming to mind, and I don't mean that hoary old example of Porsche 911 versus Cayman – a vivid case of the less-expensive sibling threatening its

elder. Instead, it made me think of two Barbera wines from the same house, Braida: Bricco della Bigotta and Bricco dell'Uccellone. Even though the prices are not as widely spaced between them, both are among the finest wines to use those grapes, both are clearly from the same winery, but they behave like two siblings with just enough personality quirks to render them *not* mutually exclusive.

Simply put, the DS-W2 is arguably the bigger, bolder of the two, while the Master 1 shows more restraint down below. It's as if the latter had a flatter response, with better overall tonal balance, while the extension seemed the same – more a question of fullness or richness versus something exhibiting greater control. In either case, the weight of the music, the feeling of mass, was convincing with the slams in 'The Boxer' from Simon And Garfunkel's *Bridge Over Troubled Water* [Mobile Fidelity UD1S 2-004 One-Step].

NOT SO DRY

Curiously, though the DS-W2 creates a sense of 'more bass', the same track had marginally more *impact* via the Master 1. I almost feel guilty reporting it, because the differences are truly minimal, and I had to try other titles to confirm it.

The entire gig saved for posterity on Twisted Sister's *Live At The Marquee 1983* [Atlantic 603497861378] has a solid, crowd-pleasing bottom end, the younger DS-W2 sounding fatter and more 'live', the Master 1 drier.

These are not deal-breakers but deal-makers, and your speakers may end up making the choice for you. So controlled are the Wilson Yvettes [HFN Feb '17], so commanding the bass, that it proved the perfect tool for assessing the variations, while never being overly excited by the DS-W2's excess. If you're having a demo, try to hear it through speakers with well-controlled woofers.

As for the rest of the spectrum, again, it's a close call. Doug MacLeod's *Break The Chain* [Reference RM-2519] offers both twangy guitars and textured vocals, the ↪



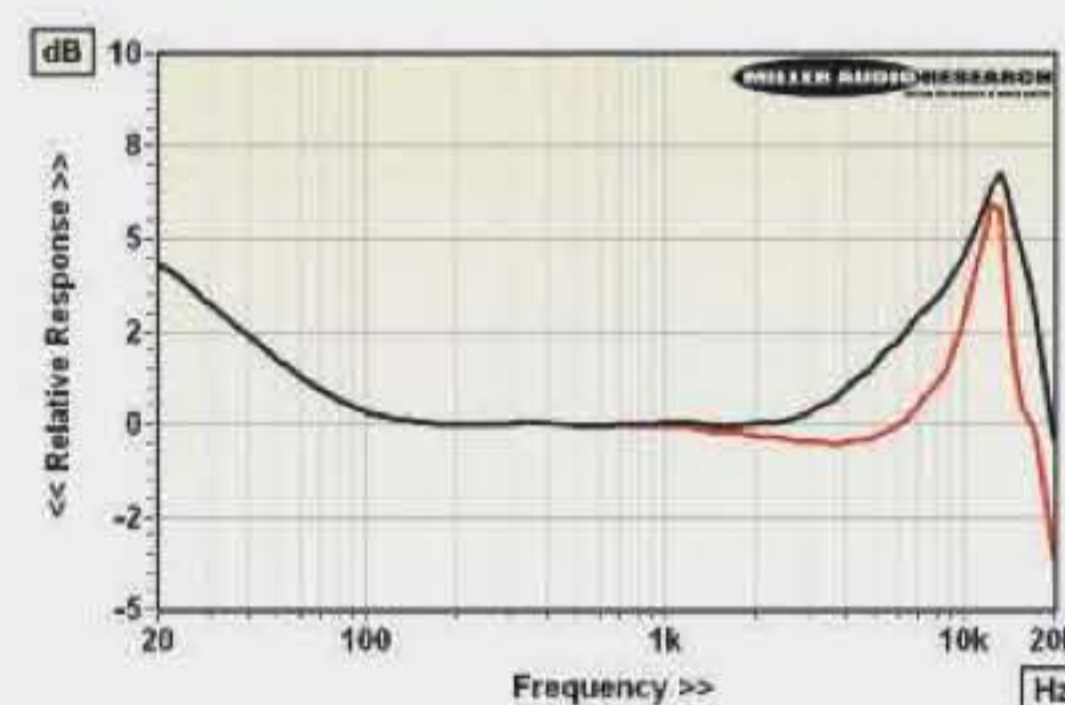
MAKING LIGHT OF LPS

The DS-W2 employs a derivative of the technology used in optical guitar pick-ups and computer mice, for inside the cartridge body light from an LED shines on a photocell which generates an electrical current. This output is modulated by the rear of the moving cantilever interrupting the light beam, directly reflecting the passage of the stylus through the analogue groove. Traditional pick-ups are velocity-sensitive devices whose voltage output increases with both groove excursion and frequency (as the stylus moves more quickly). By contrast, DS Audio's photo-electric conversion is sensitive only to the *amplitude* of the movement of the stylus. Hence the DS-W2 requires a proprietary phono stage, the DS-W2 EQ, to correctly compensate for the LP's RIAA replay characteristic. Meanwhile, refinements to the DS-W2's inner workings include better optimising the LED wavelength/photocell sensitivity, reducing suspension compliance with a tie-wire design, and reducing the moving mass by shortening the path length of the LED/cantilever/photocell mechanism. **PM**

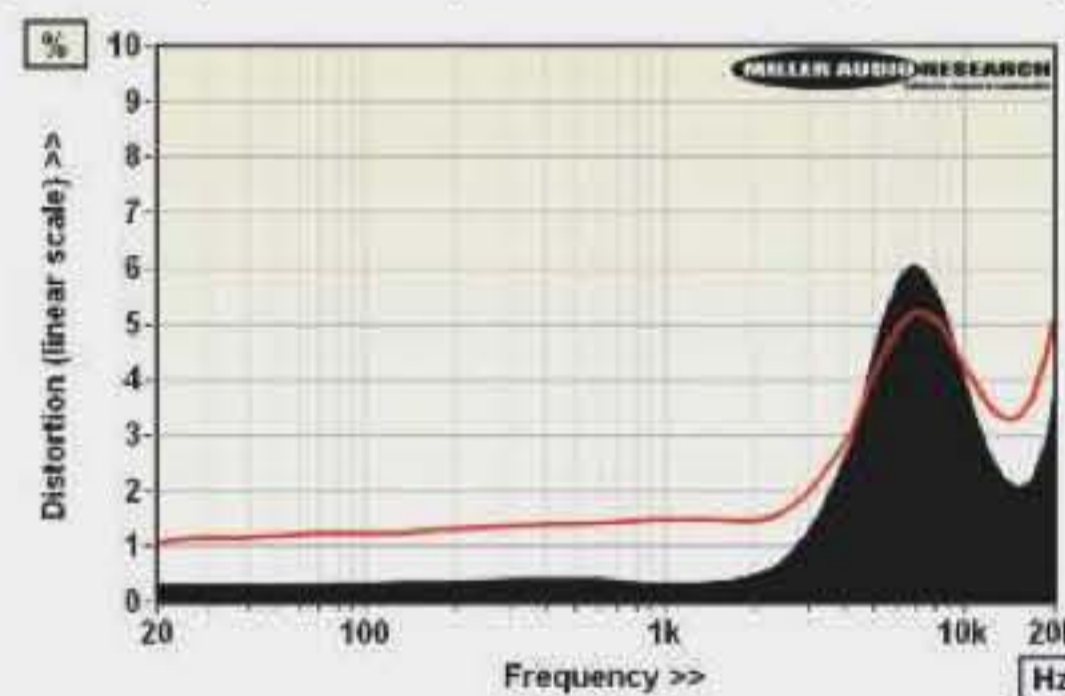
DS AUDIO DS-W2

According to DS Audio, its flagship Master 1 [HFN Dec '17] was used to derive both the DS-002 [HFN Jun '17] and now this DS-W2, so all three 'optical pick-ups' are a generation on from the older DS-W1 [HFN Nov '15]. However, with a recommended downforce range of 1.6-1.8g and tested at 1.7g, none of this trio are quite as secure trackers as the outgoing DS-W1. While the latter cleared the maximum 80µm groove pitch and the most severe +18dB modulation (315Hz lateral cut, re. 11.2µm) at <1% THD, the Master 1, DS-002 and DS-W2 are secure to +15dB but mistrack at the maximum +18dB groove modulation. This is a perfectly acceptable trade-off for the reduced dynamic compliance of the DS-W2's 'tie-wire' suspension. In practice then, its 8.1g bodyweight is offset by a low-ish 15/20cu dynamic compliance, conferring a low ~9Hz subsonic resonance in medium-to-high effective mass tonearms.

Output is a high 1.28V via the equaliser (re. 1kHz/5cm/sec) – more than sufficient for standard preamp line inputs – while the 'eq' itself yields DS Audio's customary bass boost that begins below 100Hz and reaches +4.0dB/20Hz [see Graph 1]. Once again big, reflex-loaded speakers are best avoided! The mid/presence response of the DS-W2 is slightly more uniform than either the Master 1 or DS-002 and while the 13kHz treble peak is less exaggerated it's still going to add some pizzazz at +6.5dB. This 'loudness contour' shows excellent symmetry between lateral and vertical cuts, promising a very uniform colour across the soundstage. As does the uniform trend of THD versus frequency [Graph 2] which shows any very high frequency distortion tamed by the pick-up's post-15kHz treble roll-off. PM



ABOVE: Frequency response curves (-8dB re. 5cm/sec) lateral (L+R, black) versus vertical (L-R, red)



ABOVE: Lateral (L+R, black infill) and vertical (L-R, red) tracing and generator distortion (2nd-4th harmonics) vs. frequency from 20Hz-20kHz (-8dB re. 5cm/sec)

HI-FI NEWS SPECIFICATIONS

Generator type/weight	Photo-optical / 8.1g
Recommended tracking force	1.6-1.8mN (1.7mN)
Sensitivity/balance (re. 5cm/sec)	1280mV / 0.50dB (from Eq unit)
Compliance (vertical/lateral)	15cu / 20cu
Vertical tracking angle	25 degrees
L/R Tracking ability	65µm / 70µm
L/R Distortion (-8dB, 20Hz-20kHz)	0.35-10% / 0.40-5.8%
L/R Frequency resp. (20Hz-20kHz)	+3.7 to -5.3dB / +5.9 to -0.5dB
Stereo separation (1kHz / 20kHz)	26dB / 6dB



ABOVE: Rear view of the 'DS-W2 EQ' PSU/equaliser. The pick-up's internal LED is powered via the R- and L- pins while the output is returned via R+ and L+, all via the 'Input' RCAs seen here. The equalised output is on pairs of RCAs and balanced XLRs

DS-W2's midband being detailed and open, with a slightly greater show of warmth than the more analytical Master 1. Transient attack and dynamic contrasts, too, were within sight of the Master 1's, again revealing a flipside nature to that of the dearer design. Which reminded me of a clearer analogy.

If I had to do a 'high concept' explanation (that's when someone pitches a film idea, in four words, eg, 'Godzilla meets Forrest Gump') then I would say it's 'valves versus solid-state'. While those of you who have stuck with me these past 35 years know that I am firmly of the tube persuasion, I also know it's possible to have too much of a good thing. And it's also the logic behind using solid-state amps with valve preamplifiers, or vice versa, to balance these two technologies.

In my all-valve system, the Master 1 has found a home capable of exploiting its strengths while accommodating its artefact-free, naked, open sound. The hint of richness that distinguishes the DS-W2 suggests that it might prove ideal for a solid-state set-up in need of a few degrees of heat.

With 'Sad Memory' from the Buffalo Springfield *What's That*

Sound? box set [Atco/Rhino 03497 86066], a lone voice and a couple of guitars play in a wide open space, with distance between them. The DS-W2 portrayed this with all the air I heard 50 years ago over my modest 'first system' and which convinced me that stereo was more involving than mono.

LASER-LIKE FOCUS

Image placement was precise, solid, with an atmospheric three-dimensionality that made the speakers disappear. The soundstage was as wide and deep as the Master 1's, extending beyond the speaker's sides and with chilling amounts of depth. Here, too, Richie Furay's crystal-clear vocals were delivered with nary a hint of coloration.

On the difficult, inner-groove 'Broken Arrow' the cartridge tracked it perfectly, while the transitions from crowd noise to guitars, to whatever else Neil Young threw into his opus, could be appreciated in a wall of sound, of near-Spectorian grandeur, but could be singled out with laser-like focus. The DS-W2 has no problem handling all of the details in even the most cluttered of tracks. This is a reference-grade cartridge, and blessed relief for those hankering after a Master 1, at double the price. ⚡

HI-FI NEWS VERDICT

Probably the best way to put it is this: if someone suddenly stole the Master 1 in my system and replaced it with the DS-W2, the only thing that would convince me it had been changed is the colour of the light it emits. Forgive any suggestions of great disparities between this and the Master 1, possibly overstated for review purposes. In practice, it's like trying to tell the difference between Phil and Don Everly.

Sound Quality: 88%



ABOVE: The pick-up's pins are clearly marked and separated. Just visible is the boron cantilever, tie-wire suspension and micro-ridge stylus [see also p65]