

# DS Audio DS 002

An 'entry level' cartridge at £4800? For the new baby DS 002 in the DS Audio line of LED/photocell cartridges, that's the cost of the tech – and it includes a phono stage!  
 Review: **Ken Kessler** Lab: **Paul Miller**

On a recent long drive with a fellow audio casualty, our discussion turned to high-end cartridges and how there seemed to be more technical variety 'way back when'. We cited MM, MC, moving-iron, moving-flux, proprietary oddities from Decca, Toshiba and MicroAcoustics and others. Then I remembered that the DS 002, a new £4800 'baby' from DS Audio, was arriving in a few days. And 'normal', it ain't – by any measure.

DS Audio enjoyed instant impact since its birth five years ago for having the sheer guts to release a new (or forgotten) cartridge technology in the post-vinyl era, one that was neither a straightforward MC nor MM design.

## HIGH-TECH SPIN-OFF

Whatever we believe about the scale of the LP revival, it will never again generate the unit sales of cartridges on a scale equal to the time when vinyl was the world's primary musical format. Thus, to deliver in this era of reduced numbers of high-end enthusiasts something as radical as a photocell cartridge, requiring its own phono amp/power source, takes *chutzpah*.

The parent company – Digital Stream Corporation – is a big player in other fields, such as optical mice, so we are not dealing with a tweeky one-man band. This is a high-tech operation that was able to adapt its core technologies into a spin-off, simply because its principal players wanted to do so.

So intrigued was the audio world by the DS-W1 [*HFN* Nov '15] – causing it to burst out of Japan, even though it was originally intended only for the home market – that the range has grown quickly to three models. The DS 002

**RIGHT:** This shot clearly shows DS Audio's crimped alloy cantilever, suspended by a tie-wire, and fitted with a Shibata-profile diamond stylus

is the lowest-priced model by a large sum, as its siblings include the original DS-W1 at £7500 and the extreme DS-Master 1 released last year, at £19,000.

The DS-W1, though still available, followed an earlier, discontinued model that wasn't sold outside of Japan. It is now challenged from below, because the DS 002 employs trickle-down benefits from the DS Master 1. It must be emphasised that the prices include a phono amp (a different model with each), and one can upgrade either phono box or cartridge to the top level since, usefully, both the cartridges and EQ boxes are interchangeable.

Let me remind you that the DS-W1 is fitted with a boron cantilever, tipped with a fine, line-contact stylus. The DS Master 1, in addition to a massively over-engineered phono amp, arrived with a better body, a sapphire cantilever with a micro-ridge stylus, an improved optical system in which the light source and sensor are closer together, a new cantilever suspension and a centring system in the form of a tie-wire.

Another benefit of the DS Master 1 was compatibility with a greater range of tonearms. I've heard it at shows in three different arms, and it audibly betters the DS-W1. What's going to please those intrigued by the photocell technology, but for whom the price of either of the earlier cartridges is prohibitive, will be learning that the DS 002 is closer to the Master 1 than the DS-W1.

## SPACED OUT

While being a direct beneficiary of the advancements seen in the DS Master 1,

the DS 002 uses an aluminium body instead of the 'ultra-duralumin' of the dearest model, albeit of a similar design. Its aluminium cantilever is fitted with a Shibata stylus but it gains the wire suspension system

'Bass sounds as if it might cut loose like a runaway train...'

of the DS Master 1 for greater compatibility with assorted tonearms.

This also contributes to easier set-up, but I was warned by Editor PM to have some spacers ready if I was going to use my 12in SME Series V arm. The DS 002 is almost as shallow as a Decca, and the arm tube of the Series V is tapered, so the 'fat' end nearest the pivot can foul the edge of an LP once the arm height is set. I guesstimated that a 2mm shim would do it, and it worked a treat, but different arms will require different solutions.

Setting-up the DS 002 was much easier than tuning the DS-W1, and not just because the body is as user-friendly as that of a Denon DL-103. VTA was much less fiddly and everything snapped into focus once the sweet spot was reached. I

found that it worked best with the cartridge top perfectly parallel to the surface of the LP.





**LEFT:** A pressed alloy body and top plate with threaded lugs ensures the DS 002 can be bolted tight, though its very shallow profile means a shim may be required to prevent the back of the arm fouling on its lift. SME owners take note

Once you switch on the EQ/phono stage unit, the cartridge lights up with a blue stripe across the front, which the infantile toy lover in me found both mesmerising and reassuring. OK, so it's not necessary, but it looks pretty cool, especially if you're the sort who turns out the lights when listening to music.

### SOUNDSTAGE MAGIC

It was a blast from the (recent) past, the DS 002 providing the same 'blackness' in the silences as the DS-W1, as well as bass that sounds as if it might cut loose like a runaway train... but never does. Again, it was not apparent with either LS3/5As or KEF LS50s [HFN Jul '12], manifesting itself as added richness rather than the harbinger of woofer Tourette's. Crucially, too, my reference Wilson

Alexia loudspeakers [HFN Mar '13] do not encourage ill-mannered bass, whatever the source, as their coherence and control will rein in the worst offences.

The audible gains offered by the DS 002 were foreshadowed in the DS-W1, which Editor PM posited might be due to 'the response of the cartridge being free of the multitude of small HF resonances that afflict all MM and MC types. It could be the single most important factor in determining the "smoothness" and "blackness" of its sound'. Whatever the reasons, this cartridge certainly exploits speakers with tight focus and a 'hot seat', like Wilsons or others with a regime involving positioning to the millimetre, or small monitors that act like point sources.

With this level of soundstage magic

on offer, I turned to my recently-established roster of LPs that includes the Mobile Fidelity 'One-Step Process' edition of Santana's *Abraxas* [Mobile Fidelity UD1S 2-001], Johnny Winter's *The Progressive Blues Experiment* [Imperial LP12431] as representative of a normal release, and the 45rpm double LP of Bob Dylan's *Highway 61 Revisited* [Mobile Fidelity MFSL 2-463] in mono for contrast.

### ONE-STEP TOO FAR?

It is not, of course, all about soundstage or imaging, and I appreciate fully that there are those for whom such matters are secondary because they are 1) usually artificial, 2) a product of stereo with no bearing on mono and 3) have nothing to do with sound quality *per se*, only with spatial concerns.

Many of the industry's sages – starting with Arnie Nudell, then of Infinity, and the late Jason Bloom of Apogee – impressed upon me that you cannot have one without the other. Tonal accuracy/neutrality versus imaging/soundstage – I believe them, as I have found that few monumental systems do one without the other (mono aside). Great imaging and poor tonal quality? Great sound but dire soundstage? Why choose between them?

Recently, I was taken to task for using the One-Step album because it gives an 'unfair advantage' to any component

being reviewed [see p117]. I see it in exactly the other way: analogous to test-driving a Ferrari on a perfect road rather than on cobblestones. But I did not want to start with the Santana release, which would set the

tone of the session by spoiling me. Instead, I turned to the Johnny Winter album, which is simply 'normal' in that it is a circa late-'60s standard pressing, recorded with no added privileges such as a legendary producer or monumental studio. If anything, the sound has been described as 'grungy', perfect fodder for those who think a good system can cut through murk. Or, more accurately, not add to it. ↻



### THE LIGHT FANTASTIC

Inside the DS 002 light from an LED shines on a photocell, generating an electrical current that's modulated by the (rear) of the vibrating cantilever interrupting its path. It's a derivative of the technology used in optical guitar pick-ups and optical mice. In this case, power is fed to the LED via the cartridge's R- and L- pins while the audio-modulated output is returned via R+ and L+. Matching the wavelength of the internal LED to the sensitivity of the photocell was key to maximising the efficiency of the 'photo generator' and it's here, along with minimising the moving mass of the pick-up while optimising the suspension of the cantilever, that much of the 'tweaking' of the design has been directed.

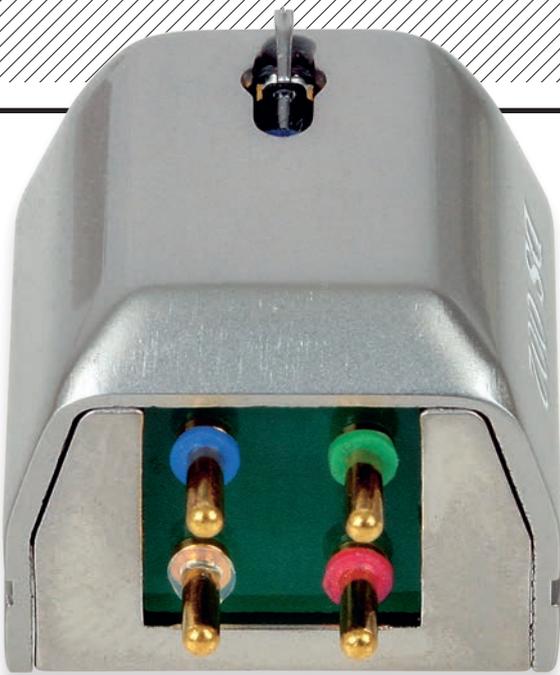
In contrast to velocity-sensitive MM/MC pick-ups, where the output increases with groove excursion and frequency, DS Audio's photo-electric conversion is sensitive only to the *amplitude* of the stylus' movement. However, as LPs are cut with the RIAA replay characteristic then the DS 002's output still requires phono equalisation before being passed to a line-level pre or integrated amplifier. PM

## DS AUDIO DS 002

With a recommended downforce range of 1.6-1.8g and tested at 1.7g, the DS 002's Shibata stylus requires a slightly heavier hand than the line-contact type fitted to the DS-W1 [HFN Nov '15]. It's a good tracker but not quite as secure as the DS-W1 which surmounted the maximum 80µm groove pitch and cleared both channels at +18dB (315Hz lateral cut, re. 11.2µm at 0.5% THD). By contrast the DS 002 is secure to +15dB but 'lets go' at the maximum +18dB groove modulation. The VTA is better adjusted in the DS 002, however, down from 29° to 22°.

The DS 002's bodyweight is some 1.6g heavier at 8.1g but its dynamic compliance is even lower at 15/20cu, so it still delivers a low 8-9Hz subsonic resonance in medium mass arms. Once again, this is emphasised by the DS 002's strong sub-100Hz bass that amounts to +5dB/20Hz, so this breed of pick-up is still not ideally suited to big, reflex-loaded loudspeakers! By way of proof that DS Audio is aware of this excessive bass 'punch', it offers a filtered output, bringing the response down to +2.8dB/20Hz [see dashed blue trace, Graph 1].

Output is 0.84V via the equaliser (re. 1kHz/5cm/sec) and while the DS 002 still shares the DS-W1's bright upper treble there's now a marked improvement in L+R and L-R response symmetry [see Graph 1], indicating a more uniform soundstage (left-to-right and front-to-back). Distortion is higher at 0.5-9% (-8dB re. 5cm/sec) but, once again, more uniform between phases [Graph 2]. The final indication of DS Audio's improved generator design lies in its stereo separation – now 25dB (mid) to 10dB (high treble) where the DS-W1 was almost 'mono'. PM



**LEFT:** Another view of DS Audio's alloy cantilever and fulcrum/suspension arrangement. The cartridge pins are gold-plated and well spaced to accommodate most tonearm leads/tags – power for the internal LED is supplied via the green and blue pins

Indeed it does, for the DS 002's sonic cleanliness meant that nothing unsavoury was being added to the playback. It is pristine almost in the manner of a Shure V15Vx, but without sounding sterile. It's particularly beneficial if, like me, you're drawn to the Winter release because of a passion for bottleneck guitar. The ringing and jangling elements enjoy a clarity and twang that adds to the presence while diminishing the artifice of it being a recording, not reality.

### SANTANA'S VIBRANCY

This places the instruments in the room with unmistakable actuality. The lower registers possess plenty of mass, with the DS 002's plump bottom proving beneficial – for this LP can sound slightly thin with certain cartridges, especially MM types. While pedants and purists would say the DS 002 is adding its own colour to the music, I prefer to think of it as serving the purpose of the bump in an LS3/5A's lower registers, which *suggests* bass that the small monitor just doesn't have.

Here, there's plenty of stage width and depth for the DS 002 to exploit, particularly on the leaner tracks, like 'Bad Luck And Trouble'. This is effectively a guitar versus blues harp battle, spread across the room. Each element was located with utter precision, while the Bob Dylan 45rpm mono had perfect central positioning. The whizz-bang dexterity of the DS 002 in three dimensions was of no concern here, and one could focus on sound quality. Every vocal tick and musical

lick was as natural as I've ever heard it. The DS 002 showed why many enthusiasts are declaring the MoFi Dylan monos *better* than the 1960s pressings, as 'visceral' doesn't begin to convey how real it sounds.

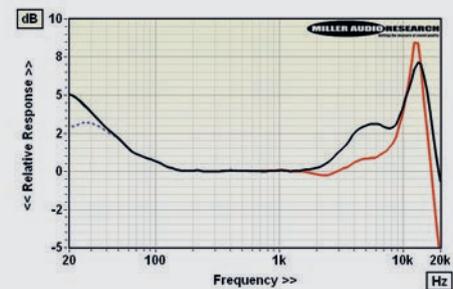
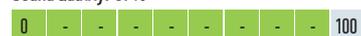
Then we come to the vibrancy and shimmer of the One-Step release. With this LP, we witness the panoply of the DS 002's talents, and the results are spectacular. There is more warmth to be found in classic MCs, chiefly old-school Koetsus or Ortofans, while Deccas are yet to be beaten for upper-frequency sparkle, but this cartridge struck me as a dream mash-up of all that I love from those disparate types.

Dazzling details, the faultless interplay of the Latin rhythms that define Santana's oeuvre, powerful percussion – all exist on this LP and the DS 002 revealed the lot. You'll soon forget the blue lights, the optical tech. You'll simply listen. 🎧

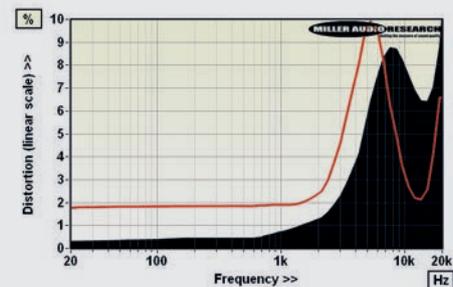
### HI-FI NEWS VERDICT

Charmed by the DS-W1, I am staggered to find its 'budget' sibling is even more enchanting. Any reservations about the surfeit of bass are easily addressed by system tuning, and should never undermine the pick-up's unique virtues – especially the openness and transparency – that must be attributed to the photocell tech. This is clean, yet sweet, precise in imaging and grand in scale. It's another triumph, for sure.

Sound Quality: 89%



ABOVE: Frequency response curves (-8dB re. 5cm/sec) lateral (L+R, black; subsonic filter, blue dashed) 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	Optical / 8.1g
Recommended tracking force	1.6-1.8mN (1.7mN)
Sensitivity/balance (re. 5cm/sec)	838mV / 0.56dB (from Eq unit)
Compliance (vertical/lateral)	15cu / 20cu
Vertical tracking angle	22 degrees
L/R Tracking ability	75µm / 70µm
L/R Distortion (-8dB, 20Hz-20kHz)	0.3-9.1% / 0.5-8.1%
L/R Frequency resp. (20Hz-20kHz)	+7.8 to -0.8dB / +5.0 to -3.7dB
Stereo separation (1kHz / 20kHz)	25dB / 10dB