

# DS Audio DS-W3

Updating the DS-W2 with a host of trickle-down technology from the brand's flagship 'dual mono' Grand Master, the new DS-W3 'optical' pick-up looks to steal the limelight  
 Review: **Ken Kessler** Lab: **Paul Miller**

**A**n object lesson in how to create a monopoly: make something no-one else can copy. As tricky to manufacture as CD players, electric cars, digital cameras and quartz watches might have been at the outset, competitors soon emerged for each. Not so DS Audio's 'optical' cartridges, which have captivated the high-end since arriving in 2015. Imitators have yet to emerge.

At £4995 for the new DS-W3 cartridge, £9495 for the matching energiser/equaliser, or £12,995 if purchased together for a £1495 saving, it's not like the rewards aren't there to inspire other manufacturers. The package, it must be remembered, also obviates the need for a phono stage as DS cartridges do not work with RIAA circuitry [see PM's boxout, p69].

## A HEAD START

As for the dearth of opposition, cynics would argue that rewards are limited because the high-end pick-up market isn't that large. But R&D costs would be high, and DS Audio has the very real advantage of being in the wing of a company with long experience in related optical devices.

The Japanese company has been prolific – I think this is its 11th or 12th new cartridge – but while each model

has sounded slightly different they have all borne an evolving family resemblance. The third generation was launched in 2020 with the flagship Grand Master [HFN Feb '21], and the technology has trickled down to the 'W' model, to create the DS-W3 tested here, as a replacement for the DS-W2 [HFN Jan '19]. Visually, this new cartridge looks like its siblings until you switch on the energiser. An LED strip glows a fiery red, in place of the less bold colours – such as lavender, green or blue – we've seen before. This hue, not dissimilar to that of a Ferrari, promises performance, and it's matched by the red tell-tale on DS Audio's matching energiser.

## SPLIT MECHANISM

Inside, the optical system benefits from 'Gen 3' gains including independent LEDs and photo-detectors for the L/R channels, resulting in increased output voltage (from the cartridge, not the equaliser), which is now 70mV versus the earlier models' 40mV. The manufacturer also attributes improved left and right channel separation and S/N ratio to the split optical mechanism.

Keeping with the look of extant models, the DS-W3's body is still unusually shallow. DS Audio produces lightweight plates to insert between the

**LEFT:** The boron cantilever and lightweight beryllium 'shading plate' are visible here in front of a thin-film screen designed to limit dust particles accumulating on the two photocells beneath

**INSET:** Although the DS-W3 benefits from much of the Grand Master's updates, the pick-up still uses a boron cantilever. The clean line-contact stylus, seen here at x30, is cemented into a hole at the tip of the boron rod

cartridge and headshell if arm height becomes an issue, particularly with some tonearms – SME specifically – that widen towards the rear, at the LP's edge. As the DS-W3 weighs only 7.9g, use of these plates should not add substantially to the mass.

Also part of the third generation improvements is a thinner, lighter shading plate, reduced from 1.56mg to 0.74mg by using 99.9% pure beryllium in place of the previous aluminium. The cartridge body is aluminium, and the wiring 1.6 times thicker than that of the previous generation, lowering its internal impedance. The cantilever is boron, the stylus a line contact type [see inset pic, above] and the DS-W3 tracks at 1.9g, 0.2g higher than typical of the Gen 2 models, if I remember correctly.

## QUICK CHANGE

For once in my on-going relationship with DS Audio cartridges, I auditioned the energiser before the cartridge, rather than cartridge first or both at the same time. This was a simple substitution that took all of two minutes as I keep a DS Audio cartridge in operation at all times on one of my record decks; the model in question being the DS-003 [HFN Oct '21], an earlier Gen 3 design costing a modest £4995 with energiser, or the same as the DS-W3 cartridge on its own.

Wow! The new energiser utterly transformed the performance to another level, especially for bass solidity, an even quieter background (quite an achievement as the DS Audio cartridges have always been ghostly in that area), and greater 'speed'. Also indicative of the energiser improvements, eg, greater reservoir

**RIGHT:** The DS-W3's alloy body and top plate ensures it can be bolted tight to the headshell. The decorative LED strip is a very useful cueing aid but is separate from the internal LEDs that form the photo-electric mechanism

capacitance, is that it takes longer for the charge to dissipate, the lights staying on far longer than with previous models.

All of this suggests – and I hope retailers won't hate me for saying this – that while each DS Audio cartridge has a matching PSU/equaliser which is its natural partner, the upgrade path isn't necessarily buy-the-next-model-up-cartridge. Instead, some might opt for a less expensive cartridge with a dearer energiser/equaliser, or vice versa, because occasionally the better energiser may be a wiser solution, especially for perennial upgraders.

To understand this, I contacted Tetsuaki Aoyagi, DS Audio president, who told me: 'The basic configuration of the DS-W3 equaliser has not changed, but we have optimised the components to match the third-generation cartridge'. What this simply confirmed was that the DS Audio system, which allows any of its cartridges to be used with any of the energisers, needs to be auditioned both as a package, and in mix 'n' match mode. Depending on your responses, you might end up saving money... or spending more.

It is also important to note that this energiser, like the Master models, allows

you to choose between balanced XLR and single-ended RCA outputs, with a choice of 30Hz and 50Hz filters. I certainly preferred the balanced output, while the filters came into play when I switched loudspeakers

from Quad ESL63s [HFN Sep/Oct '81] to Falcon Acoustics LS3/5As [HFN Dec '18], and then to Wilson Sasha DAWs [HFN Mar '19]. And these settings can be easily determined by ear, because the DS-W3's delivery is as revealing as any you will

hear, especially at the frequency extremes [see PM's Lab Report, p71].

Another issue to consider is how the DS Audio DS-W3 – indeed, all DS cartridges – seems immune to tonearm influence.

*'Like a Denon DL-103 on steroids? Yes, it's that huge'*

## LIGHT SPEED

Strictly speaking, while all DS Audio's phono cartridges use photo-electric technology – derived from the guitar pick-ups and computer mice of the Digital Stream 'optical device development' company – they still 'pick-up' from the groove using a mechanical stylus and cantilever. However, the stereo current that's output via the DS-W3's L+ and R+ terminal pins is derived from the light of two fixed, narrow-beam 5V LEDs (one per channel) shining on a pair of photocells. This output directly reflects the passage of the stylus through the analogue groove because the LED light paths are partially interrupted by what DS Audio calls a 'shading plate' – a lightweight beryllium film that's connected to the moving cantilever. The LEDs, meanwhile, are powered via the DS-W3's L– and R– pins using a proprietary PSU and equaliser [inset picture].

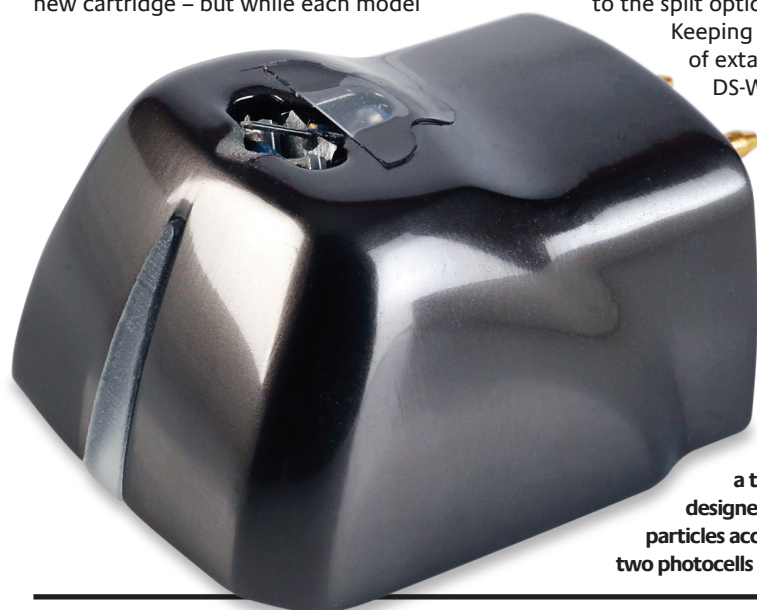
Because DS Audio's photo-electric conversion is sensitive only to the amplitude of the movement of the stylus, unlike velocity-sensitive MC/MMs whose output increases with both groove excursion and frequency, the DS-W3 requires only a relatively subtle HF boost to realise a 'flat' response with all RIAA pre-equalised LPs [see Lab Report, p71]. So while DS Audio's various 'optical' pick-ups can be mixed-and-matched with its range of PSU/Eq boxes, none are compatible with traditional phono preamps (and vice-versa). PM

I tried it in a straight carbon-fibre-tube arm, a J-shaped metal-tubed arm and a straight titanium arm, and the tracking, silences and other concerns remained so truly constant that it was a struggle to differentiate between them. Indeed, even with a severely-warped LP, in a deck costing 1/10th the price of the entire package, the DS-W3 tracked without complaint.

## WIDE OPEN

Although I tried both DS Audio's least expensive energiser and the Master model, I settled on the DS-W3 cartridge/energiser pictured and tested here as it's this natural pairing that really concerns us. My notes include mention of the superbly recorded Muddy Waters and The Rolling Stones live set *Checkerboard Lounge – Live Chicago 1981* [Eagle Vision/Ward VQBD-10107], where the initial impact was the recreation of the club's soundstage, so airy and so wide open and perfectly defined that I immediately thought of it as 'Denon's DL-103 on steroids'. Yes, it's that huge.

I was able to match liner notes to lineups, so even a non-musician like me could distinguish Ron Wood's guitar from that of John Primer, and Mick Jagger's distinctive vocals struggling to match the legitimacy of Muddy Waters' gruff tones. What the new DS Audio system brought to the performance was an opening up of the sound such that a listener with forensic tendencies could more easily home in on a particular performer. ☺





**ABOVE:** Rear view of the DS-W3's PSU/equaliser. The pick-up's internal 5V LED is powered via the R- and L- pins while the output is returned via R+ and L+, through the 'input' RCAs. The equalised outs, on RCAs and XLRs, are filtered at either 30Hz or 50Hz

Still with live material, and even more illuminating, was *Eric Clapton's Crossroads Guitar Festival 2019* [Rhino/Reprise RI 628789], with a stellar lineup including Jeff Beck, Buddy Guy, Sheryl Crow, Bonnie Raitt, Keb' Mo' and of course, Slowhand himself. I could only marvel at the way the cartridge emphatically recreated the sound of each guitar, Fenders vs. Gibsons, solid-bodied vs. semi or acoustic.

I don't want to portray the DS-W3 primarily as a tool for analysis, and seasoned listeners know that too diagnostic a sound can be fatiguing, because the DS Audio 'sound' is both unforgiving, revealing warts and all, while also being gently ameliorative, eg, the way it handles warps. On 'Baby, Please Come Home', with Jimmy Vaughan on guitar and Bonnie Raitt on vocals, the fear of 'too much information' proved groundless.

### MISSION IMPOSSIBLE

Too much information? This track places a traditional electric blues band in front of a horn section, with a massive, Hammond-y organ pumping away. What resulted was the near-impossible combination of

a Spector-esque 'Wall of Sound' but with such precision that nothing was swamped by the rest. Better still was the sensation of stage depth, which – if one could look at the soundstage from above – was a big, fat oval stretching from wall to wall.

Sailing through the mono tracks on the The Beatles' *...The Christmas Records* [Apple/Universal 02557 91485] also proved revelatory. These remastered transfers from what were only previously available on low-fi flexi-discs, a lone compilation LP from 1969, also of so-so sound quality, or via bootlegs which were needle-drops of either, were elevated to another level entirely by DS Audio's duo.

### YULE LOVE IT

While regarded merely as the Fab Four fooling around in the studio to offer an annual thanks to the Official Beatles Fan Club's members, the details exposed by the DS-W3 were ear-opening – even to this aged fan who's heard them countless times. The festive sound effects and snippets of chat revealed as much as any documentary about the band's evolution when all seven singles were played chronologically. And the mono aspect? Rock-solid central positioning, even from coloured vinyl 7in discs. I am dazzled. ☺

### HI-FI NEWS VERDICT

With the DS-W3 pairing, DS Audio has again created an upgrade which – rather than confound previous owners – increases the number of choices while reinforcing the avoidance of obsolescence. New to the brand? Buy the package. Existing user due for an upgrade? Either component will yield a boon. The DS-W3 is among the best yet, certainly at the price point, and I'll despair when it's returned.

Sound Quality: 88%



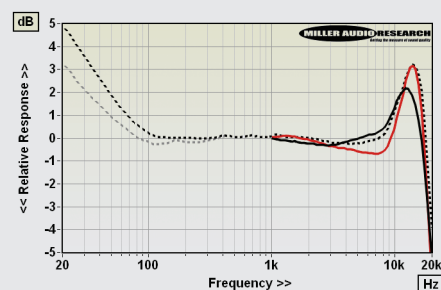
**ABOVE:** Cartridge pins are gold-plated, clearly marked and usefully spaced. Note that the DS-W3 can only be employed with one of DS Audio's purpose-designed LED power supply and equalisers [top]

## LAB REPORT

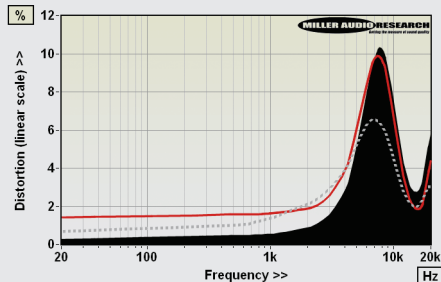
### DS AUDIO DS-W3

Three years ago, DS Audio leveraged advances in its then-flagship Master 1 [HFN Dec '17] to 'evolve' the DS-W1 [HFN Nov '15] into DS-W2 [HFN Jan '19], and it has performed the same trick with the new DS-W3, which borrows heavily from the current flagship Grand Master [HFN Feb '21]. Except, in this case, the 'upgrade' from DS-W2 to 'W3 is more significant than from 'W1 to 'W2. Specifically, the 'W3 now has the 'dual mono' generator with separate L/R LEDs, a lighter shading plate and thicker internal wiring that we saw in the Grand Master. It benefits from a reduced moving mass which pushes the 'W2's 13kHz treble peak out to a higher 15kHz in the 'W3, also at a less severe +3.2dB amplitude [see Graph 1]. The improved light path has tightened the channel balance to 0.2dB, and widened HF stereo separation from a poor 6dB (W2) to 15dB (W3, re. 20kHz) while conferring better lateral/vertical symmetry – this is evident in both the response and distortion versus frequency plots [see Graph 2].

The bass boost, seen in all previous DS cartridges, amounts to +3dB/20Hz with the 50Hz filter in tow or +4.5dB/20Hz with the 30Hz filter, neither being especially useful when partnered with big, reflex-loaded speakers. DS Audio has attempted to counter this by 'stiffening' the compliance of the DS-W3 away from the 15cu of the 'W2 closer to the 11cu of the Grand Master while also increasing the downforce from 1.7g to ~2g. This pushes the arm/cartridge resonance upwards, but tracking suffers slightly, the DS-W3 only clearing a 70µm groove pitch and moderate +15dB modulation (315Hz lateral cut, re. 11.2µm) at <2% THD. The 2.1V output (1kHz/5cm/sec) is a function of the equaliser. PM



**ABOVE:** Frequency response curves (–8dB re. 5cm/sec) lateral (L+R, black) vs. vertical (L–R, red) vs. stereo (dashed, 50Hz filter, grey; 30Hz filter, black)



**ABOVE:** Lateral (L+R, black), vertical (L–R, red), stereo (dashed) tracing and generator distortion (2nd–4th harms) vs. freq. from 20Hz–20kHz (–8dB re. 5cm/sec)

### HI-FI NEWS SPECIFICATIONS

|                                   |                                 |
|-----------------------------------|---------------------------------|
| Generator type/weight             | Photo-optical / 7.9g            |
| Recommended tracking force        | 18.5–20.5mN (19.5mN)            |
| Sensitivity/balance (re. 5cm/sec) | 2068mV / 0.18dB (from Eq unit)  |
| Compliance (vertical/lateral)     | 12cu / 15cu                     |
| Vertical tracking angle           | 22 degrees                      |
| L/R Tracking ability              | 65µm / 70µm                     |
| L/R Distortion (–8dB, 20Hz–20kHz) | 1.0–6.6% / 0.55–7.5%            |
| L/R Frequency resp. (20Hz–20kHz)  | +3.6 to –3.9dB / +5.5 to –0.6dB |
| Stereo separation (1kHz / 20kHz)  | 24dB / 15dB                     |