

DS Audio Master 3

Conceived to replace the Master 1, but with all the 'third generation' technology unveiled in the Grand Master, the Master 3 is described as a 'semi-flagship' pick-up...
 Review: **Ken Kessler Lab: Paul Miller**

To borrow a phrase from the Buffalo Springfield (though it defined a far graver situation than a change of cantilever), 'there's something happening here – what it is ain't exactly clear'. DS Audio has released yet another cartridge in the Master series, the Master 3 (£8330 without PSU/equaliser) and I fear it's going to be an even bigger disruptor than the Grand Master EX [HFN Oct '23].

All DS Audio's optical pick-ups require a combined outboard PSU, to power the LED light sources, and equaliser, to manage the output from the photocells [see PM's boxout, p49]. Personally, I consider the equalisers to be less important in determining overall sound than the cartridges, so if the £18,885 Master 3 Equaliser is not within your reach, then the Master 3 cartridge will sound just as seductive via the DS-003 Equaliser [HFN Oct '21] for £3660. Naturally there are differences between the equalisers but these are not deal-breakers: slightly greater headroom, a touch more solidity in the

'It has the slam of an unburstable powerhouse'

RIGHT: DS Audio uses a polished 'ultra duralumin' alloy for the body and a stainless cradle, inside, for the optical mechanism

bottom but – repeatedly – I've heard bigger differences from cartridge to cartridge.

PRETTY IN PINK

In the Master 3 Equaliser, massive at 452x153x484mm (whd) and weighing 23kg, the power supply has been improved. Like DS Audio's other

Master equalisers, it provides three sets of outputs with varying filters, each on single-ended RCA or balanced XLR connections. Cut-offs of 30Hz or 50Hz are selected by a toggle on the back, with each output adding a unique slope [see PM's Lab Report, p51]. I reviewed the Master 3 through full-range loudspeakers with massive amplifiers, so chose the setting with least filtering.

When switched on, a vertical strip on the equaliser lights up in a pink/purple hue to match the LED on the front of the cartridge. An arbitrary measure of the added capacity of the equaliser's power supply is that it took considerably longer for the lights on both cartridge and equaliser to fade to black after switch off.

The Master 3 is one of DS Audio's third-generation

LEFT: Gold-anodised plates inside the equaliser connect the huge electrolytics feeding each side of the fully discrete, fully balanced filter and output stage [bottom]



designs, all now utilising independent LED and photo detectors for the two channels. A greater photocell output voltage is claimed, from 40mV to 70mV, with improved channel separation and lower noise. I already thought that DS Audio cartridges presented the lowest noise floor imaginable but this baby is even quieter.

Physical changes include a 50% weight reduction in the reshaped shading plate, as well as a change from the second-generation cartridge's aluminium to 99.9% pure beryllium. Just as Lotus always pursued lightness for better performance out of its racing cars, so has lower moving mass been a goal for every cartridge designer since the dawn of the microgroove record.

HIP TO BE SQUARE

Because of these changes, the third-generation shading plate's weight has been halved from 1.56mg to 0.74mg, which is, says DS Audio, 'less than a 10th of the mass of the core and coil system of a typical moving coil cartridge'. The internal wiring is 1.6x thicker in these third-gen designs, lowering their impedance, but this has no impact on the moving mass.

While all of the above matters, after a long conversation with PM we agreed that

perhaps the most important element of this cartridge, and which pretty much undermines all that has gone before, is the change from circular to a square cantilever cross-section. Although the Master 3 has a diamond 'Micro-Ridge' stylus bonded to a diamond cantilever, as does DS Audio's Grand Master [HFN Feb '21], the square-section rod is stiffer – ie, more resistant to bending across the square of the cross-section, as illustrated in the micrograph picture [see below].

Having handled very many DS Audio cartridges, I was ready for a cartridge body so low that the rear arm height needs to be altered substantially to get the correct VTA, but the manufacturer can supply shims that are the exact same shape as the top of the cartridge to give you a millimetre or two if necessary.

Otherwise setup of the Master 3 was absolutely straightforward, with tracking spot-on at exactly 2.1g, although care is still needed when setting overhang as the cartridge rides low over the LP surface.

MAIDEN VOYAGE

Nothing readied me for the initial impact of the first track I played with the Master 3 – I am still trying to grasp the significance of both the bottomless reaches of the bass extension and the scale of the soundstage. I simply was not prepared for such audible gains over every cartridge in my arsenal.

LIGHT WORK

Although DS Audio's phono cartridges use photoelectric technology they still 'pick-up' from the groove using a mechanical stylus and cantilever which present all the same issues of compliance, tracking force, tracking ability, tracing accuracy and tonearm matching that we have with conventional MMs and MCs. Unlike MM/MCs however, optical cartridges do not rely on electromechanical principles to generate an output. Instead, the Master 3's discrete, two-channel output (carried by the L+ and R+ terminal pins) is derived from the light of two fixed, narrow-beam 5V LEDs (powered via the R- and L- pins) shining on a pair of photocells. The LED light paths are modulated by what DS Audio calls a 'shading plate' – a V-shaped sliver of beryllium film connected to the moving cantilever – that reflects the passage of the stylus through the analogue groove.

Because DS Audio's photoelectric conversion is sensitive only to the amplitude of the movement of the stylus, unlike velocity-sensitive MM/MCs whose output increases with both groove excursion and frequency, the Master 3 requires only a relatively subtle HF boost to realise a 'flat' response with all RIAA pre-equalised LPs [see Lab Report, p51]. The LED PSUs and equaliser are housed in a single, heavyweight chassis [see inset pic]. PM



ABOVE: The illuminated 'power on' strip is quite separate from the special LEDs used inside the photoelectric 'mech'. DS Audio's body shape demands care in setting the arm height



LEFT: Micrograph reveals the 'Micro-Ridge' profile stylus cemented onto the end of the novel square-section diamond cantilever

Compiled by Analogue Productions in 2008, the triple LP anthology *Thorens 125th Anniversary* [ATD135] features Rimsky-Korsakov's 'Dance Of The Tumblers' from *The Snow Maiden*, performed by Eiji Oue and the Minnesota Orchestra.

So bombastic was the initial impact that I was at first tempted to attribute it to greater playback levels provided by the Master 3's higher output.

What led to this conclusion was that I had changed from the Grand Master to the Master 3 without touching the volume settings. But even after matching them, there was still a far greater sensation of

mass, scale and perceived level via the Master 3. This is usually what I would attribute to going from a little two-way speaker to a woofer-filled floorstander. It's not something I ever expected from a cartridge, and certainly not from one model to another within the same family – even with the aforementioned improvements. As far as conveying the visceral presence of an orchestra, this cartridge has few if any equals.

SMOOTH GROOVES

But that's only part of the picture. What really took me back was its cossetting silkiness. DS Audio cartridges rarely sound as romantic as, say, an Ortofon SPU. Absolute transparency is the family trait, yet the Master 3 is the cashmere dressing gown of cartridges. The warmth and richness all but defies the super-costly Grand Master EX flagship, which by comparison is on the cooler side in the Venn diagram of sonic textures.

Deservedly praised, the £18,995 Grand Master EX remains an exceptional device, its one-piece cantilever/stylus assembly eliminating any minor deviations due to

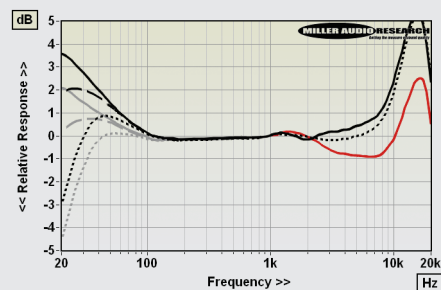


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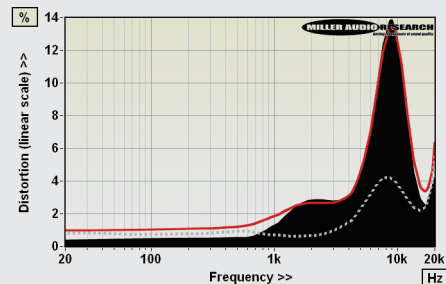
DS AUDIO MASTER 3

While the Master 3 effectively replaces the Master 1 [HFN Dec '17] there are clearer parallels with the newer 'third generation' Grand Master [HFN Feb '21]. The stiff, square-section diamond cantilever, reduced moving mass and dual-mono LEDs/photocells benefit almost all areas of the pick-up's mechanical and electrical performance. While a +5dB boost in photocell output is claimed for the Master series, the 2.7V output (1kHz/5cm/sec) of the equaliser is purely a function of the designer's choice of gain as are the six tailored 'bass contours', three rolling off from a notional 50Hz and three from a lower 30Hz. Output 1 [rear panel, left] provides a +3.6dB/+1.9dB boost at 20Hz in 30Hz/50Hz settings [black/grey traces, respectively, Graph 1], while Output 3/50Hz [dotted grey trace] with its -4.4dB/20Hz bass roll-off is suited to systems with big, reflex-loaded speakers.

The 'peaky' HF response of +5.3dB/16kHz [Graph 1, dotted stereo trace] is seen with all the Master series and this extended bandwidth is also reflected in the ~6% stereo THD peak being pushed up to 9-10kHz here [Graph 2, below]. The dual photocells hold stereo separation to 29-30dB through the midband while the bonded diamond stylus/cantilever combination offers a 24° VTA with a moderately 'stiff' 11cu compliance, suiting mid/heavy effective mass arms. Despite this, the Master 3 offers the most secure tracking of any DS Audio cartridge yet, clearing the 80µm groove pitch (75µm on the right channel) at a 2.1g downforce and only just nudging over 1% THD on the maximum +18dB test track (re. 0dB at 315Hz/5cm/sec). PM



ABOVE: Freq. resp. (-8dB re. 5cm/sec) lateral (L+R, black) vs. vertical (L-R, red) vs. stereo, dotted. Bass only: Output 1/30Hz, black solid; 2, dashed; 3, dotted; Output 1/50Hz, grey solid; 2, dashed; 3, dotted



ABOVE: Lateral (L+R, black), vertical (L-R, red), stereo (dotted) 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	20-22mN (21mN)
Sensitivity/balance (re. 5cm/sec)	2.67V / 0.5dB (from Eq unit)
Compliance (vertical/lateral)	11cu / 15cu
Vertical tracking angle	24 degrees
L/R Tracking ability	80µm / 75µm
L/R Distortion (-8dB, 20Hz-20kHz)	1.4-6.9% / 0.6-5.6%
L/R Frequency resp. (20Hz-20kHz)	+3.6 to -0.4dB / -0.2 to +5.1dB
Stereo separation (1kHz / 20kHz)	29dB / 24dB



ABOVE: The PSU/equaliser provides power for the pick-up's internal LEDs via the input RCAs [centre]. The outputs, on RCAs and XLRs, offer different levels of bass boost from two alternative - 30Hz and 50Hz - turnover frequencies [see Graph 1, opposite]

movement at the bonded stylus junction. And yet the Master 3's bonded stylus/square-section cantilever had all of the EX's precision but without any trace of the clinical. It was as if someone wanted to grace a cartridge with the warmth of a Western Electric 300B triode while at the same time giving it the slam and control in the lower registers that one might only attribute to an unburstable solid-state powerhouse such as the D'Agostino Relentless [HFN Mar '20].

Staying with live music, I wanted to sample the other end of the scale, with a reduction in the size of the soundstage and the number of instruments. Art Farmer's *Portrait Of...* [Craft Recordings CR00605] rewarded with life-sized performers in a convincing approximation of a studio, as if my listening room had changed dimensions.

Aside from live events, I cannot recall ever hearing brass with such punch, clarity and attack. The piano was so authentic I had to tap a few keys on the real one in our lounge. Had time allowed, I would have used the Master 3 to re-acquaint myself with my entire Miles Davis

collection and the new pressing of Keith Jarrett's 1973 solo concerts in Bremen and Lausanne, but instead I moved to vocals of unrivalled power.

TAKING IT ALL IN

Etta James is perhaps the greatest R&B singer of all time, but her 1978 set *Deep In The Night* [Pure Pleasure PPA BSK3 156] was criminally lost in the shuffle. Admittedly, purists might have been upset by the inclusion of a number of rock covers, but what she did with The Eagles' 'Take It To The Limit' and a peerless reading of 'Piece Of My Heart' to rank with Joplin's - well, let's just say that the Master 3 ensured that I played the entire album all the way through instead of cherry-picking the tracks.

This LP showed how the cartridge could handle emotion and vocal range. Rising to the occasion, it delivered Etta's forcefulness so successfully that you soon forget the oft-heard Eagles version. That alone rendered the Master 3 an 'event component'. But what shook me, again, was the spatial display when the chorus emerged behind her in 'Take It To the Limit'. This was simply positioning so realistic that it made me think that the 'semi-flagship' Master 3 is as close to flawless as any cartridge I've heard. ☺

HI-FI NEWS VERDICT

Every range has its sweet spot, and the Master 3 is certainly that for DS Audio - even with its costly matching equaliser. But pair it with one of the less pricey equalisers and you have not just a bargain, but one of the best-sounding cartridges money can buy. You get the soundstage of a Denon DL-103, the excitement of a Decca, tracking to worry a Shure V15 and the warmth of a Koetsu. It's a blessed miracle.

Sound Quality: 92%



ABOVE: The Master 3's pins are clearly marked and separated. Also visible are the shading plates, diamond cantilever and Micro-Ridge stylus [see also p49]