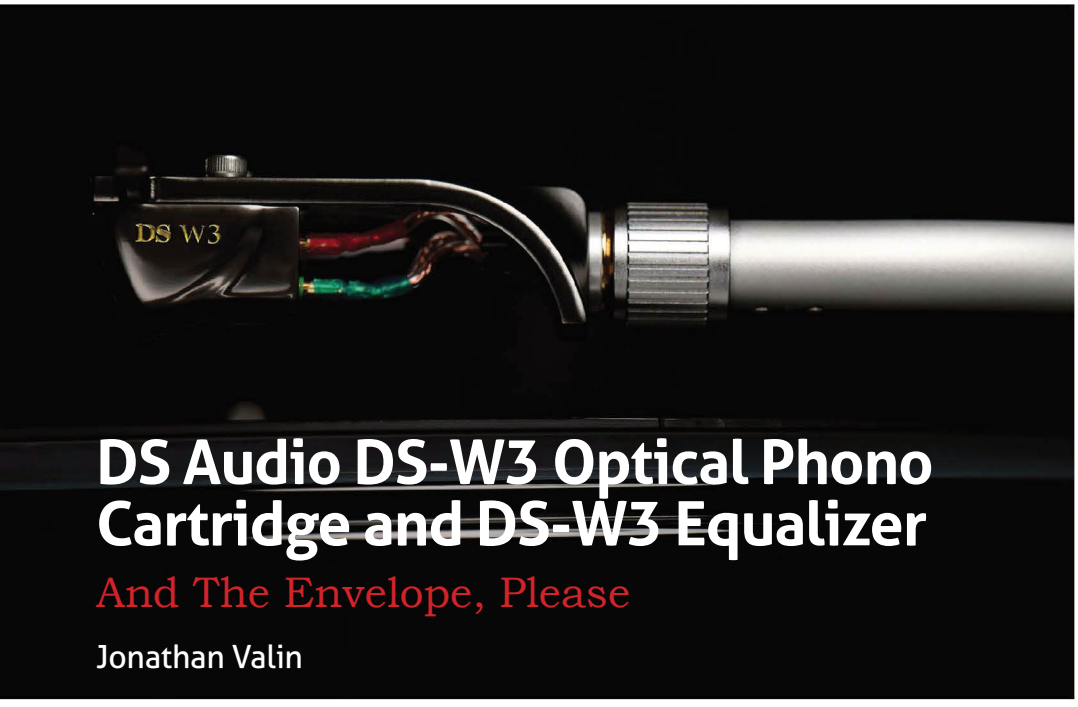


DS Audio DS-W3 Optical Phono Cartridge and DS-W3 Equalizer

And The Envelope, Please

Jonathan Valin

If it seems as if I've been reviewing a lot of DS Audio cartridges lately, that's because the Japanese company has been introducing superb new models at a lively clip, all of them incorporating the third-generation technology DS introduced in its $15k Grand Master. That cartridge and its $45k equalizer were, at the time I reviewed them about a year ago, the most advanced examples of the analog playback device that the Japanese company has more or less reinvented—the optical cartridge (oc). While we've grown used to a parade of game-changers in digital audio (MQA and streaming being the most recent), analog is a different story. Since Ortofon's patent of the moving coil circa 1946, Norman Pickering's invention of the moving-magnet cartridge with user-replaceable styli and (along with Joe Grado) the moving-iron cartridge circa 1948, and Columbia's introduction of the long-playing monaural record in 1948 (followed by the first stereo LP in 1957), there haven't been many radical developments in the world of vinyl. This is not to say that improvements weren't made in cartridges throughout the latter half of the twentieth century and the start of the twenty-first, just that those improvements have tended to be refinements of electromagnetic designs that have remained fundamentally unchanged for the last three 75 years. So, the advent of a transducer that is truly new (and in many respects, better) is something to write home about—which is what I'm doing now, for the fifth time.

Employing light to register the modulations engraved in an LP's grooves may seem vaguely digital at first glance, but all DS optical cartridges are analog devices that use a stylus-based groove-reading system, just like magnetic cartridges do—only they don't use magnetism to generate their signals. Here's how they work: The intensity of the light from two miniaturized LED "lamps" (one for the left channel, the other for the right) situated in the front of the cartridge body is continuously modulated by the movement of tiny, extremely low-mass, beryllium "shading plates" (once again, one for each channel) attached to the stylus/cantilever. As the stylus/cantilever vibrates, the shading plates vibrate in sympathy, blocking varying amounts of the light coming from the tiny LED lamps. This variable luminosity is then turned into variable voltages by photodiode receptors seated behind the shading plates and sent on to a dedicated equalizer, where the electrical signal is EQ'd and boosted to line level.

DS Audio's owner Tetsuaki ("Aki") Aoyagi is responsible for this ingenious rethinking of the oc. His contributions to its design are the direct result of the work that the Digital Stream Corporation (his father's company) did to develop the computer-era optical mouse. By substituting the cool-running miniaturized LEDs and miniaturized photodiodes found in optical mice for the hot, tiny, failure-prone incandescent bulbs and bulky, low-sensitivity "electric eyes" used in the scattered few earlier-gen optical cartridges (such as the groundbreaking albeit short-lived Philco "Beam of Light" from the early 1940s or the equally transitory Toshiba C-100P from the 1970s), Aki turned an unreliable twentieth-century curiosity into a wholly reliable twenty-first-century success story.

And the DS Audio oc *is* a success story. It is not often that a new product makes its own market in an old industry. But Aki's products have done that—to such an extent that certain forward-looking electronics manufacturers (Soulution, EMM Labs, Meitner, Westminster Labs, and more to come) are now incorporating optical eq in their phonostages.

Why oc's have become so popular is not hard to fathom—they work and sound better. First, without the weight of magnets and coils they have extremely low moving mass, which reduces inertia. Moreover, since there is no magnetic resistance to the movement of the stylus (since there are no magnets or coils to generate such resistance), the stylus can glide through the grooves without having to fight against a restraining back force, allowing for more accu-

rate tracking and tracing, higher resolution of musical detail, and an octave-to-octave smoothness and continuousness of tone and dynamics that is very tape-like (and very realistic).

Second, since oc's generate no magnetic fields and their output is typically >70mV, they do not induce any hum, noise, or RFI (at least, they don't when their eq unit is properly grounded). Their noise floor is vanishingly low. Though digital fans are used to it (or at least to a frighteningly dead, interstellar version of it), this depth of background silence is new to LP playback. As I've written before, we analog hounds have become so inured to the way in which RF audibly modulates the signal from an LP that a transducer/phonostage *without* RF simply has to be heard to be believed. Even then, it's hard to accept. It's as if you've been listening to music with your window open on a noisy street. All of a sudden, the DS Audio closes the window. You just hear so much more, so much more purely and faithfully.

Third, thanks to the oc's extraordinarily powerful, deep-reaching bottom end, which, in theory, goes down to 1Hz, and the absence of background racket (including the occasional AM station or passing CB), its similarity to the sound of 15ips R2R tape (which also has rich, powerful, deep-reaching bass and little-to-no susceptibility to RF) is far closer than what you get from conventional magnetic playback. As a result, DS Audio transducers have been a revelation to fidelity-to-source listeners, for whom the sound of the mastertape is the Golden Fleece. However, it's also a dream come true for as-you-like-it and absolute-sound listeners, since its noise-free clarity is accompanied by unusually plush timbre, three-dimensional imaging and soundstaging, superb dynamic range and transient response, and (on great recordings) a superior illusion of real musicians making music in a real space.

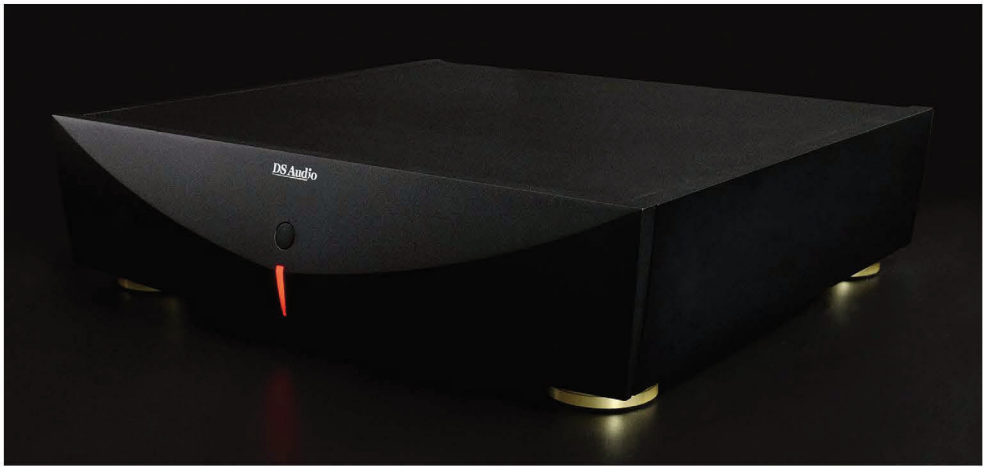
Fourth, Aki has "shared the wealth" of his remarkable technology, offering more and more outstanding products that incorporate his latest innovations at a wide variety of price points. Rather than catering solely to the ultra-rich (though he does that, too), Aki has made a point of trickling his ingenious new designs down to a broader market. Which brings me to the cartridge under review—the $5000 DS-W3.

According to DS's North American importer Garth Leerer of Musical Surroundings, the W3 is the new first entry in DS Audio's "Reference Level" line. The classification is based on the materials used in the W3 and its more sophisticated and expensive ($10k) dedicated equalizer, which features improved circuitry (allowing for four levels of bass eq), two balanced outputs to go with two unbalanced ones (just like the Grand Master equalizer), and a very large power supply (ditto). For considerably more moolah, the $9500 Master 3 (add $17.5k for its dedicated equalizer) and $15k Grand Master (add $45k for its dedicated equalizer) are the next steps up in DS's "Reference Line," with the $22,500 Grand Master EX and its novel single-piece diamond cantilever/stylus at the very top.

The improvements in the W3's cantilever material, stylus, and dual LED/photodetector system (derived from the Grand Master) are said to allow it to translate groove modulations more readily to the super lightweight moving parts of its optical generator. Its higher output (>70mV) and better channel separation (typically >33dB) combined with the minimal filtering of its massively engineered dedicated equalizer are said to

DS-W3 Equalizer

LIKE THE GRAND MASTER UNIT, the DS-W3's companion phonostage/equalizer benefits from thicker circuit boards (increased from 1.6mm to 2.0mm) and denser copper-foil traces (up from 35µ to 70µ). Of course, the DS-W3 phonostage is not as large, complex, or state of the art as the two-chassis Grand Master EQ. Though it does provide four different roll-off curves for the low frequencies (the GM has six), it doesn't have the flexibility, power-supply storage capacitance, channel separation, S/N ratio, etc. of the pricey GM (although it has considerably more of all these things than the much smaller and simpler DS-003 equalizer). As a result, the sound of the cartridge played back through it is, as I've noted, just a little less firmly controlled, finely resolved, and tape-like smooth top to bottom than that of the GM. (If you run the DS-W3 through the Grand Master phonostage or Soulution's fabulous new 757 phonostage, as I did as an experiment, you will see that the primary sonic difference-maker here is the equalizer, not the cartridge itself.) Four-and-a-half times more dollars better buy you something, and it does in the DS Audio line, though the extent of improvements which that added investment makes will depend, to a degree, on the transparency of your speakers, amplification, and turntable.



Absolute Analog DS Audio DS-W3 Cartridge and DS-W3 Equalizer

Specs & Pricing

DS-W3 Optical Cartridge
Signal output: Photo-electric conversion
Channel separation: >27dB (1kHz)
Output signal level: >70mV
Cantilever: Boron
Body material: Aluminum
Stylus: Line contact
Weight: 7.9g
Price: $5000

DS-W3 Equalizer
Output voltage: 500mV (1kHz)
Output impedance: Greater than 120 ohms
Preamp input impedance: Greater than 10k ohms
Input terminal: RCA
Output terminal: 2x RCA terminal, 2x XLR
Dimensions: 45cm x 12cm x 435cm
Weight: 13.5kg
Price: $10,000

MUSICAL SURROUNDINGS
(510) 547-5006
info@musicalsurroundings.com

JV's Reference System
Loudspeakers: MBL 101 X-Treme MKII, Magico S3 2023, Magnepan LRS+, 1.7, and 30.7
Subwoofers: JL Audio Gotham (pair), Magico SSub (pair)
Linestage preamps: Soulution 727, MBL 6010 D, Siltech SAGA System C1
Phonostage preamps: Soulution 757, DS Audio Grand Master EQ
Power amplifiers: Soulution 711 (two), MBL 9008 A, Siltech SAGA System V1/P1, Odyssey Audio Stratos
Analog source: Acoustic Signature Invictus Neo/T-9000 Neo, Clearaudio Master Innovation, TW Acustic Black Knight/TW Raven 10.5
Tape deck: United Home Audio Ultima Apollo, Metaxas & Sins Tourbillon, Analog Audio Design TP-1000
Phono cartridges: DS Audio Grand Master EX, DS Audio Grand Master, DS Audio DS-W3, Clearaudio Goldfinger Statement v2.1, Air Tight Opus 1, Ortofon MC Anna, Ortofon MC A90
Digital source: MSB Reference DAC, Soulution 760, Berkeley Alpha DAC 2
Cable and interconnect: Synergistic Research Galileo SRX (2023), Crystal Cable Art Series da Vinci, Crystal Cable Ultimate Dream
Power cords: Crystal Cable Art Series da Vinci, Crystal Cable Ultimate Dream, Synergistic Research Galileo SRX
Power conditioner: Synergistic Research Galileo SX (two), AudioQuest Niagara 5000 (two)
Support systems: Critical Mass Systems MAXXUM and QXK equipment racks and amp stands
Room Treatments: Synergistic Research Vibratron SX, SteinMusic H2 Harmonizer system, Synergistic Research UEF Acoustic Panels/ Atmosphere XL4/UEF Acoustic Dot system, Shakti Hallographs (6), Zanden Acoustic panels, A/V Room Services Metu acoustic panels and traps, ASC Tube Traps
Accessories: DS Audio ES-001, DS Audio ION-001, SteinMusic Pi Carbon Signature record mat, Symposium Isis and Ultra equipment platforms, Symposium Rollerblocks and Fat Padz, Walker Prologue Reference equipment and amp stands, Clearaudio Double Matrix Professional Sonic record cleaner

deliver more immediacy, higher resolution, truer tone color, and larger dynamic swings than the still-outstanding $2500 DS-003 (add $3500 for its dedicated equalizer).

And so they do—and then some.

As was the case with the DS-003, the DS-W3 bears a marked sonic resemblance to the DS Audio Grand Master, from which it has inherited so much technology. Indeed, the resemblance is so close that had I not already heard (and fell in love with) the GM, I could have easily settled for the W3 and its equalizer. (Frankly, I could have settled for the DS-003, although it doesn't have quite the same low-end power, color, and extension, soundstage breadth and depth, and tape-like dynamic/harmonic continuousness as the DS-W3.)

Though the W3 uses a boron cantilever rather than the 003's aluminum one and a slightly improved line-contact stylus, the two transducers are otherwise more alike than different. As noted, both make use of the third-generation design advances introduced in the Grand Master (independent LEDs and photodetectors for the left and right channels, independent beryllium shading plates for each channel with 50% lower mass than the original aluminum plates, internal wire that is 1.6-times thicker and lower in impedance than that used in DS Audio's second-generation transducers). However, their dedicated equalizers are entirely different, and it is the improvements to the W3's far more sophisticated EQ unit that more than likely account for the sonic edge it holds over the 003.

To hear what the DS-W3 can do, you need only put an old, familiar, well-recorded LP on your table, sit down, and listen. As has been the case with every DS Audio transducer, affordable or not-so-much, that uses Aki's third-gen technology, the DS-W3 shows its virtues immediately. This is not a component you will have to puzzle over, trying to deduce via close listening how and where it is better (or worse) than what came before it. In large part, this is because the DS-W3 (and its brethren) aren't analytical transducers that seemingly break musical sounds down into component parts ("Boy, those cymbal transients are hard hitting!" "Listen to the decay on that piano!" "Man, those voices are tightly imaged!" "Gee, that Fender bass is powerful!"). It is, instead, one of those rare synthetic

products that turns parts into wholes without losing expressive performance or engineering detail. You hear everything (or almost everything)—and you hear it against (and in part because of) an unequaled backdrop of silence—with a completeness that (on the best sources) turns the audible into the visible.

Another signal advantage of the W3—one that, as you will see, it shares with Magico's marvelous 2023 S3 loudspeaker (reviewed elsewhere in this issue)—is what HP called "continuousness." Though HP used the word to describe the broad, seamless soundstaging of an orchestra in a real hall (as opposed to the left-center-right imaging of same on a stereo LP or a digital transfer), I've long applied the term to dynamics and timbre, as well, because in life (and on a good 15ips R2R tape) tone colors and dynamics also sound smooth and continuous, without the bumpy dips and peaks in pitch and timbre or the sharp step-like (rather than smooth, ramp-like) changes in intensity that make LPs and CD/SACDs sound, well, recorded.

Like all DS oc's, the WS also has superb transparency to sources. Take Ted Jensen's phenomenal two-LP remastering of *Stop Making Sense* [Sire], the great soundtrack to Jonathan Demme's film of the Talking Head's December 1983 live concerts at The Pantages Theater in Hollywood. I've been listening to original pressings of this LP since its release in 1984, and, folks, it's never sounded this wonderful before. Where the original was markedly digital in balance—which is to say, flat in aspect, thinned down in timbre, and amped up in transient response—the remastered version is uncannily analog. Not only do Tina's bass and Chris' drum kit sound much fuller in body, deeper-going in pitch, and denser and more lifelike in timbre—in my opinion, DS Audio optical cartridges simply own the bottom octaves (for which see the sidebar)—but the mindboggling complexity of Byrne and Company's arrangements, in which so many musical threads, acoustic and electric, are being spun simultaneously and harmoniously in real time, is laid out in front of you like the table service and crystal at a three-star in Paris. If you want to hear who is doing what on which instrument, and you want to hear this without any digital subtractions of color and body, the DS-W3 is your ticket to musical bliss.

This astonishing trick of retaining (indeed, clarifying) complex musical lines and performance details without verging on the analytical is another signal virtue of DS' opticals—and, along with a high measure of continuousness, one that it shares with reel-to-reel tape. While the DS-003 has these qualities, it doesn't, as noted, present them with quite the same completeness as the W3 and its equalizer.

So, why should you buy a Master 3, a Grand Master, or a Grand Master EX rather than a DS-W3 and its equalizer? Well, the answer is you shouldn't—unless you simply can't live without the ultimate in musical resolution and smooth tape-like color, body, and bass. The DS-W3 will take you, maybe, 85% of the way to Nirvana. Where it falls just a bit short of the better and the best is in overall neutrality (it is a mite on the bottom-up side in tonal balance) and resolution of the finest musical, performance, and engineering detail.

As I said earlier, I could live with it happily. And you could, too. It's as close as you're going to come to a mastertape-like presentation for anything near its price. tas

DS Audio Bass

CONVENTIONAL MOVING-COIL or moving-magnet cartridges read the velocity of a stylus' vibrations; so, the strength of their output signal depends on how *fast* the stylus moves. Optical cartridges, on the other hand, read the amplitude of the stylus' vibrations; so, the strength of their output signal depends on how *far* the stylus moves. According to DS, this is significant because velocity-proportional devices move faster at higher frequencies, thus making the voltages of these frequencies overly strong (and those of the slower-vibrating bass notes relatively weak). Although the RIAA circuits in phonostages are intended to invert this accentuation of the treble and reduction of the bass (and loading mc cartridges down can further dampen this treble pre-emphasis), it is a fact that mc's, in particular, are relatively "bright" by nature. Thanks to its amplitude-proportional technology, the W3's electrical output is not frequency dependent, at least according to DS Audio. Thus, it does not exaggerate the treble or reduce the bass, making equalization relatively simple and extending linear low-end response to well below what mm's and mc's are typically capable of.