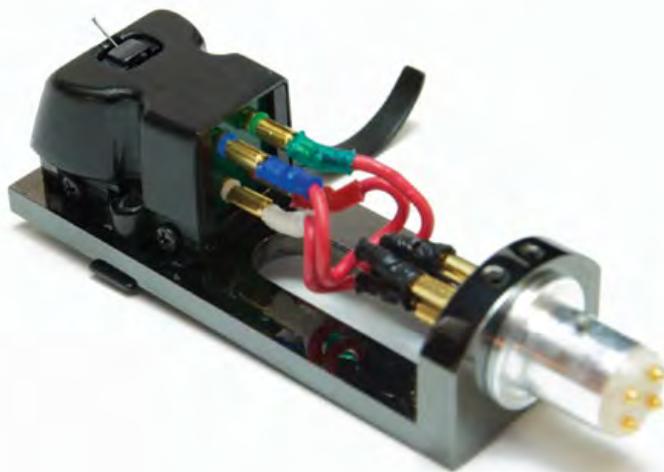


# EQUIPMENT REPORT



## DS Audio DS-W1 "Nightrider" Optical Cartridge

Let There Be Light

Jonathan Valin

**A**lthough it may seem novel because of its rarity, using light to read the undulations engraved in LP grooves and photoelectric cells to convert them into voltages is a relatively mature technology. The Japanese were already experimenting with optical cartridges in the 1960s, and periodically since then various iterations of this idea have popped up on the market.

Indeed, it wasn't all that many years ago that I reviewed the ELP Laser Turntable, which used beams of laser light (five of them, precisely aimed at various spots on the shoulders and the bottom of a record groove and controlled by a large mirror) as a "stylus." Those beams of laser lights were then reflected off the grooves to optical sensors and transformed by the ELP's photoelectric circuitry into equalized line-level signals. The advantages of this system were manifold: Since there was no stylus, there was no stylus wear; moreover, because of its laser-based, groove-depth sensor, the ELP was said to be able to read warped or damaged records more effectively than mechanical styli.

While it may seem counter-intuitive given its CD-like use of light, there was nothing "digital" about the ELP Laser Turntable. The system worked rather more like Laserdisc players (remem-

ber them?), reading analog data rather than a series of zeros and ones, and simply (or not so simply) turning them into currents. There was no analog-to-digital or digital-to-analog conversion at any stage of the process.

Despite its undeniable ingenuity, the ELP did have a problem that, for me, proved intractable. To wit, the laser stylus had no way of distinguishing between data and, well, dirt. Unless a record was immaculately cleaned (and even then), the lasers would read and amplify any specks of dust and grime embedded in the grooves as if they were part and parcel of the musical signal. Now it's true that conventional mechanical styli also "see" this detritus as they track grooves, but because of their mass they tend to push such dust and dirt ahead of them like snowplows (until, of course, enough crap collects on the stylus to induce mistracking). As a result, the "sound" of dirt doesn't register as distinctly via conventional playback as it did via the ELP, which, with really worn records, produced a kind of crunching noise in the background.

Comes now the latest iteration of optical playback: DS Audio's new DS-W1 "Nightrider" cartridge. A "re-creation" of a 1960s design that is considered a classic in Japan, the Nightrider uses state-of-the-art technologies developed by Japanese photo-optics specialist Digital Stream Corporation (the co-inventor, along with Microsoft, of the optical mouse) that simply weren't available when the original was built. For the purpose of comparison, the primary thing that sets the new Nightrider apart from something like the ELP is that it uses a conventional Shibata diamond stylus attached to a conventional boron cantilever, rather than beams of laser light, to read the grooves. As a result, it doesn't have the ELP's problem of distinguishing dirt from Debussy—a *major* advantage.

Of course, the Nightrider's Shibata stylus also has considerably more mass than the ELP's near-massless beams of light, though DSC claims that the entire Nightrider stylus/screen apparatus—for which see below—has less moving mass than the ELP's mirror-guided system. Be that as it may, compared to a conventional moving-coil or moving-magnet cartridge, in which the stylus/cantilever has to leverage heavy coils and magnets at its back end, the Nightrider is spectacularly lightweight. Housed in a machined aluminum body that contains no magnets or coils, it weighs in at a mere 6.5 grams and tracks between 1.3 and 1.7 grams, with 1.5 grams said to be optimal.

Here's how the Nightrider works: The cartridge uses a light source (a miniature LED) that is powered by the included equalizer/power supply (which replaces your phonostage) via the tonearm cables and internal tonearm wiring. The record-groove vibrations transmitted by the stylus/cantilever modulates this LED light via a moving screen, and the modulated light is picked up by a photoelectric sensor. This photodiode converts the light into an electrical signal, sending it back through the tonearm cabling to the equalizer/power supply unit, which amplifies the signal into a RIAA-equalized line-level output. Unlike the ELP, there are no lasers in the Nightrider. As with the ELP, there is nothing digital about the DS-W1. It is an entirely analog device.

In addition to the Nightrider's extremely low-moving mass, DS Audio claims that the cartridge offers a superior mechani-

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cal/electrical interface. Conventional moving-coil or moving-magnet cartridges are based on a “velocity-proportional” system, wherein the strength of the output signal depends on how fast the stylus moves. The Nightrider, on the other hand, uses an “amplitude-proportional” system, wherein the strength of the output signal depends on how *far* the stylus moves.

According to DS Audio, this is significant because velocity-proportional devices move faster at higher frequencies, thus making the voltage of those frequencies disproportionately strong. Although the RIAA circuits in phonostages are intended to compensate for this accentuation of the treble (and relative reduction of the “slower-moving” bass), and loading mc cartridges down can also reduce this treble emphasis, it is a fact that mc’s, in particular, are relatively “bright” by nature.

Thanks to its amplitude-proportional technology, the Nightrider’s electrical output is not frequency dependent. Thus, it does not “pre-emphasize” the treble (or reduce the bass), making RIAA equalization relatively simple. (The Nightrider’s EQ/phonostage box uses passive RIAA, dual-mono gain circuitry with highest-quality film capacitors, and an oversized power supply with Schottky-Barrier diodes for fast recovery times. The entire circuit is housed in a rigid, mechanically grounded chassis with spiked feet.)

So...how does all this nifty technology sound?

In a word, “good.” In several words, “much better than the ELP.” In several more words, “much better than any optical cartridge/record player I’ve yet heard.” In sum, “much better than I expected.”

Though I’d heard the Nightrider sound quite good at various trade shows, I wasn’t sure precisely *what* I expected from it in my own system. My guess was something along the lines of a less sterile, more dynamic ELP, which, in addition to its problem with worn or dirty grooves, had a particularly bland sound that, to my ear, seemed to greatly reduce the audibility of differences in engineering and mastering among my beloved RCAs, Mercuries, and Deccas.

But...I was wrong. The Nightrider was not at all bland or ELP-like. Indeed, it was quite rich and beautiful sounding.

It is not always (or often) the case that theoretical advantages translate into sonic ones. The Nightrider is an exception—or appears to be. It does *not*, in fact, emphasize high frequencies in the way velocity-proportional moving coils do. Indeed, in tonal balance it sounds more like an exceptionally quick and detailed moving magnet than a moving coil. (Another reviewer has compared its sound to reel-to-reel tape, because, I guess, of its treble-range smoothness, though the Nightrider doesn’t have *anything* like the dynamic range and sledgehammer low-end power of tapes.)

For those of us who are wedded to moving coils, the Nightrider’s presentation takes a little getting used to. Though an mc’s added energy in the upper mids and treble can be disconcerting (if not outright annoying in worst cases), it also adds (or can add) something essentially lifelike to the sound: transient speed and resolution.

It’s odd how important transients are. They aren’t “musical” in the sense of having a fundamental pitch followed by an orderly series of overtones, and yet without transients a listener cannot reliably distinguish where an instrument is located in a soundfield or how its being played. Indeed, absent a starting transient it is

often impossible to identify what kind of instrument is playing. That’s how crucial these starting and stopping noises are to ears, music, and high fidelity.

Now most transients live in the upper midrange and treble, and because of their velocity-proportional design, moving coils are particularly adept at reproducing information in this very area. It could—and often has been—argued that mc’s *over*-emphasize transient attacks (along with treble-range overtones), but when mc’s are properly designed and set up, the best of them (such as the Clearaudio Goldfinger Statement) can deliver the whole

### SPECS & PRICING

**Type:** Optical phono cartridge with dedicated EQ/power supply unit

**Output voltage:** 500mV

**Recommended tracking force:** 1.3 to 1.7g

**Stylus shape:** Shibata

**Cantilever:** Boron

**Weight:** 6.5g

**Price:** \$8500 (with phonostage)

Proscenium Black Diamond Mk V, TW Acoustic Black Knight, AMG Viella 12

**Tape deck:** United Home Audio UHA-Q Phase 11 OPS

**Phono cartridges:** Clearaudio

Goldfinger Statement, Ortofon

MC Anna, Ortofon MC A90,

Benz LP S-MR

**Digital source:** Berkeley Alpha DAC 2

**Cable and interconnect:**

Crystal Cable Absolute Dream,

Synergistic Research Galileo

LE, Ansz Acoustics Diamond

**Power Cords:** Crystal Cable

Absolute Dream, Synergistic

Research Galileo LE, Ansz

Acoustics Diamond

**Power Conditioner:** Synergistic

Research Galileo LE, Technical

Brain

**Accessories:** Synergistic ART

and HFT/FEQ system, Shakti

Halographs (6), Zanden room

treatment, A/V Room Services

Metu panels and traps, ASC

Tube Traps, Critical Mass

MAXXUM equipment and amp

stands, Symposium Isis and

Ultra equipment platforms,

Symposium Rollerblocks and

Fat Padz, Walker Prologue

Reference equipment and amp

stands, Walker Valid Points

and Resonance Control discs,

Clearaudio Double Matrix SE

record cleaner, Synergistic

Research RED Quantum fuses,

HiFi-Tuning silver/gold fuses

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MartinLogan CLX, Magnepan

.7, Magnepan 1.7, Magnepan

3.7, Magnepan 20.7, JL Audio

Gotham subwoofer

**Linestage preamps:** Souolution

725, Audio Research Reference

10, Siltech SAGA System C1,

Zanden 3100

**Phonostage preamps:** Audio

Research Corporation

Reference Phono 10, Innovative

Cohesion Engineering Raptor,

Souolution 725

**Power amplifiers:** Souolution 711,

Siltech SAGA System V1/P1,

Constellation Centaur, Audio

Research Reference 250,

Lamm ML2.2, Zanden 8120,

Odyssey Audio Stratos

**Analog source:** Walker Audio

package—transients, timbre, resolution, soundstaging, imaging, deep bass, midbass slam, etc.—with amazingly lifelike fidelity and without sounding too bright or knife-edged.

Though superior in this regard to moving magnets and many coils, the Nightrider cannot deliver Goldfinger Statement-level transient speed and resolution. This is not to say that it blunts attacks or smears detail. It does not. It is very quick, hard-hitting, and high in resolution—very rich and full-bodied in timbre, and very transparent to sources (with the Nightrider RCAs sound like RCAs, Mercuries like Mercuries, Deccas like Deccas). It just doesn't have quite the snap and slam of a fifteen-grand coil feeding a thirty-grand phonostage. To be fair, there are plenty of listeners, including many on our staff, who would prefer this smoother, darker, politer presentation.

The other thing that the Nightrider can't deliver that something like the Goldfinger can is a wall-to-wall soundstage. Of course, nothing (or nothing I've heard) is quite as good at this as the Clearaudio is, but the Nightrider isn't just a little inferior to the Goldfinger in this regard; it's a whole lot less panoramic than the Clearaudio—and than most coils I've tried. Oddly enough, this is something that was verified when my friend Andre Jennings measured the Nightrider's crosstalk (with the cartridge mounted in the TW Acoustic Raven 10.5 tonearm on the \$40,000 Raven Black Knight turntable), which barely registered 20dB left-to-right and right-to-left (though its phase numbers were excellent). By comparison, the Goldfinger and the Air Tight Opus measure upwards of 35dB (and are equally impressive in phase angle when azimuth is properly adjusted). The sonic upshot of these measurable differences is a narrower soundstage, once again rather more like that of a moving magnet than a moving coil.

Lest I scare any of you off, let me be clear: This is an excellent cartridge—certainly the finest of its kind I've heard—that seemingly combines some of the best features of mc's and mm's. Though I've compared it repeatedly to moving magnets in this review (and another reviewer has compared it to reel-to-reel tape), that is because of the natural warmth, richness, and smoothness of its timbre, particularly in the upper mids and treble, where it has a tape-like recessiveness rather than a coil-like aggressiveness. In transient response, resolution, and imaging, it is more like an mc than an mm; it's just not the full equal of an *über*-coil like the Goldfinger Statement, Air Tight Opus, or Ortofon MC Anna in these regards. Its only significant deficiency vis-à-vis coils is, as noted, soundstage width—but I wouldn't call that a deal-breaker—while its advantage

over coils is the aforementioned liquidity of its tonal balance.

In fact, when you consider that you get this marvel of engineering and its dedicated EQ/power supply unit for \$8500—and that you don't have to buy an outboard phonostage to boost its output to line level—I'd call it a very good buy. Yeah, you can do better, but, as I said about the Odyssey Stratos monoblocks, do you really want to spend five times the money—say \$15k for a Goldfinger Statement and, oh, \$30k for an ARC Reference Phono 10—on an analog rig? Though the sound will undoubtedly improve in every respect if you do so, I can't honestly say it'll be anything like five times better.

If sheer niftiness and excellent sound at a substantial savings vis-à-vis other ultra-high-end cartridge and phonostage combos are high on your analog agenda, the Nightrider is definitely a cartridge I'd seek out. **tbs**

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