Tetsuaki Aoyagi

Founder, DS Audio

BY JONATHAN VALIN

AS I noted earlier in this issue, calling the optical cartridge "new" isn't exactly correct. The idea of using light rather than magnets to generate voltages in a phono cartridge dates all the way back to the 1920s, though it took another 20 years for Philco to introduced a functional version, the "Beam of Light" transducer. The concept was subsequently reintroduced by Toshiba in the 1970s with its C-100P optical cartridge.

Unfortunately, both the Philco and the Toshiba systems were prone to failure, due to the heat generated by the bulbs of their small incandescent lamps (and the necessity for factory-replacement of those bulbs when they burned out).

With advances in the LED and photoelectric-sensor technology used in computer-era optical "mice," Tetsuaki Aoyagi, a young Japanese engineer with the Digital Stream Corporation (which, alongside Microsoft, co-developed the optical mouse), had the happy idea of adapting these cool-running, high-precision, high-reliability, miniaturized devices for use in a new Toshiba-like phono cartridge. Suddenly, heat and the wear and tear it exercised on the wiring of oc's were no longer prob-

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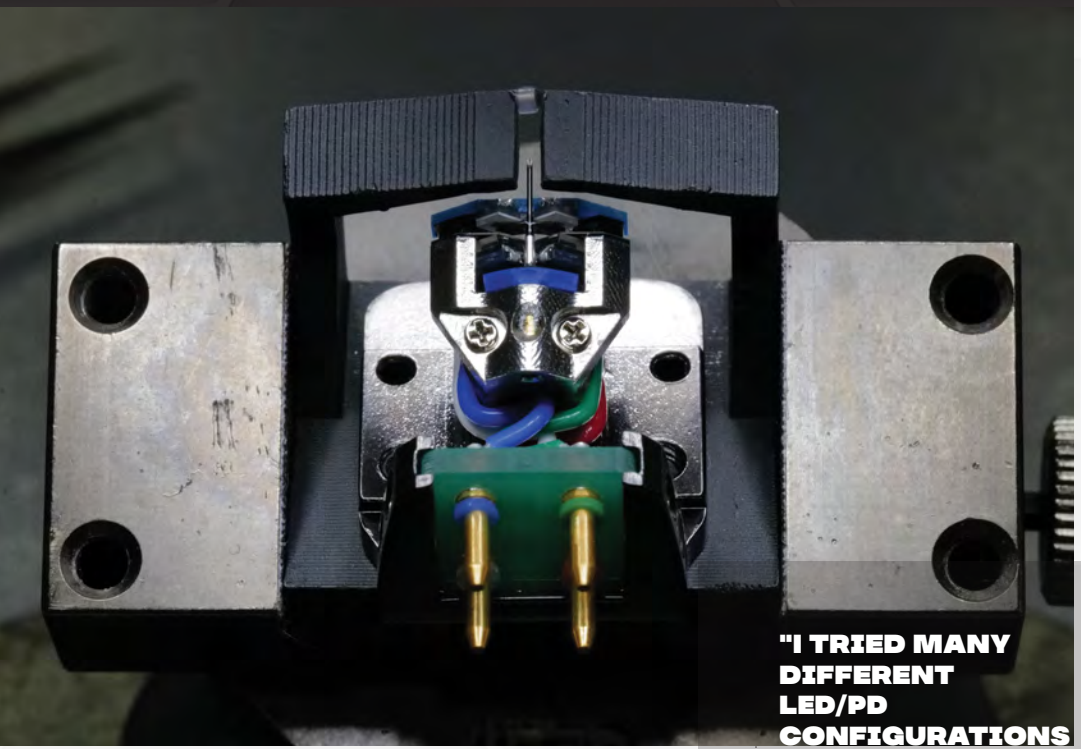
INNOVATOR OF THE YEAR

Tetsuaki Aoyagi/DS Audio



lems. Neither was bulb failure. Inertial mass was also tremendously reduced. And the accentuation of high frequencies (an unavoidable side effect of any velocity-reading system like that of a conventional magnetic phono cartridge) was theoretically eliminated.

In a short 10-year span, Aki has changed the paradigm in phono cartridges. For this achievement—and the many others that have accompanied it—Tetsuaki Aoyagi earns a well-deserved TAS Innovator of the Year Award. Indeed, IMO, Aki is the Innovator of the Decade.

Jonathan Valin: When did you launch DS Audio?

Tetsuaki Aoyagi: At the 2015 Munich Show, where we introduced the W-1.

JV: That was your only offering at the time?

TA: Yes. It was followed in subsequent years by the Master1, the 002, and the DS-W2. We then introduced the Grand Master cartridge, which was a new-generation design with independent shading plates, LEDs, and optical sensors for each channel. Much of this new-gen technology has subsequently been "trickled down" into our less expensive offerings.

JV: One of the first things any listener will notice with DS Audio cartridges is the absence of noise and hum.

TA: This comes from the elimination of the electromagnetic fields generated by magnets and coils. These fields also generate "back" forces that impede the movement of the stylus. Getting rid of them (and the electromagnetic moving mass of the coils and magnets) allows for dead quiet background silences and uninhibited tracking.

"I TRIED MANY DIFFERENT LED/PD CONFIGURATIONS IN MANY DIFFERENT PROTOTYPES BEFORE THE OUTPUT WAS SUFFICIENTLY HIGH."

JV: What led you to re-develop optical cartridges?

TA: When I joined my father's company, DSC, I wanted to try something new. My dad's business had pioneered the use of LEDs and photosensors in optical mice—a technology we sold to other companies. But I wanted to use our technologies in something of our own.

Around this time (in 2011 or 2012), a friend invited me to listen to his vinyl rig. Frankly, I was a very young man then, and I'd never heard a vinyl LP until that point. The sound was great! I asked my friend what made the sound so good, and he said he was using an optical cartridge, made by Toshiba in 1972. I asked him how it worked, and he told me about Toshiba's use of a miniature incandescent lamp and photoelectrical cells.

Of course, in 1972 there were no cool-running LEDs or photo diodes, like the ones we were using in optical mice. My friend gave me a Toshiba optical cartridge to play around with (he had been an employee of Toshiba so he had several on hand). The next day, I opened up the cartridge he'd given me and realized it was relatively simple to construct. There were just three parts: a light source, a cantilever with a shading plate, and photoelectric sensors.

I then went to an electronic parts store and bought a large number of LEDs and photo detectors. I substituted one of the LEDs and photo diodes for the incandescent lamp and photoelectric cell in the Toshiba cartridge and got sound—but at a very low level. I had to try many different LED/PD configurations in many different prototypes before the output was sufficiently high. As noted above, we brought our first fully functional effort to High End Munich in 2015.

We now have an entire range of optical cartridges and equalizers. We have also shared our equalization technology with a growing number of third-party manufacturers, allowing them to make phonostages that not only handle magnetic cartridges but also optical ones from DS Audio and other firms we've licensed our technology, too. tas