

ANALOG CORNER BY MICHAEL FREMER

INSIDER VIEWS ON EVERYTHING VINYL

THIS ISSUE: John Grado's Lineage Epoch moving-iron cartridge is taken for a test drive.

A New Epoch!

Brooklyn-based Grado Labs has been in business for 64 years, manufacturing moving-iron phono cartridges, headphones, and, for a while, even a unipivot tonearm with a wooden armwand, as well as the sophisticated, S-shaped Signature Laboratory Standard arm.

The company's founder, Joseph Grado, who well deserves the appellation "legendary," died in 2015, at the age of 90. He began as a watch builder at Tiffany & Company, and started making phono cartridges in 1953, as the hi-fi boom took off. He retired in 1990 and sold Grado Labs—still located in the same Brooklyn building where he'd begun in 1953—to his nephew John Grado Jr., who by then had put in more than a decade at Uncle Joe's company, pretty much running it after Joe had returned to what he liked best: inventing things.

At the time, Grado Labs manufactured some 10,000 cartridges annually. It's not as if Joe's new invention—three models of costly, handmade headphones—was an attempt to diversify because the cartridge business was bad. Joe also invented the highly regarded, limited-edition Grado HMP-1 omnidirectional microphone, a favorite of veteran recording engineer Peter McGrath, who is currently director of sales for Wilson Audio Specialties.

The headphones, hand-built by Joe and John, were an immediate success among audiophiles and recording professionals. Grado Labs' move into headphones has proved prescient, given the subsequent boom in that market, and with the vinyl resurgence, Grado today is poised for continued growth in both arenas, even as John Grado reaches retirement age (though it's doubtful he'll retire any time soon).

There are more Grados in the pipeline. Recently, it was announced that John's sons, Jonathan and Matthew, have joined the company.

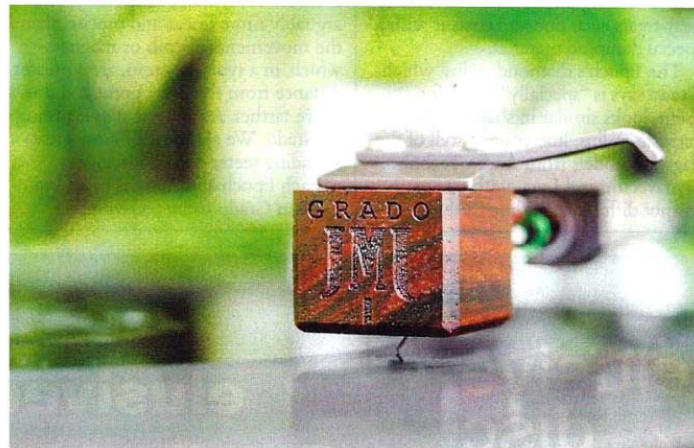
The Core Business Expands

Grado Labs' cartridge line recently expanded from three series to four: the familiar, low-cost Prestige models (\$75–\$260); the midline Reference 2s (\$350–\$1500); the former flagship series, the Statement 2s (\$350–\$3500); and their new Lineage family of cost-no-object models, which currently has one member: the Epoch (\$12,000).

All are moving-iron designs of varying outputs that use a range of materials for coils and cantilevers, as well as various stylus profiles and construction techniques. Over the years, all have

diocre, and excellent examples of every method used to turn the motions of a stylus into electricity.

With the Lineage series, Grado is clearly aiming to put itself back at the top in terms of sound, technology, and, unfortunately, price. The Epoch costs \$12,000. The Aeon, to be released in early 2018, will cost \$6000. The Aeon was actually designed first, but having heard the results, John Grado decided



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had major interior design overhauls, while their exteriors look generally unchanged. Except for the Prestige models, all have bodies of wood.

In my March 1999 column, I wrote that Grado's Reference cartridge was "among the finest cartridges I've ever heard at any price."¹ But since then, even as Grado and others continued refining their moving-iron (MI) lines, designers of moving-coil (MC) cartridges upped their game and, more important, so did designers of phono preamplifiers. I've since been hooked on MCs, though there are phono, me-

to take it to the limit and launch the Epoch first.

These new cartridges make use of Grado's patented Flux-Bridger generator system and other technologies that, Grado claims, are taken to new levels of sophistication in materials and construction in the Lineages. In the Flux-Bridger, four fixed coils are associated with a fixed magnet and multiple pole pieces that create four magnetic gaps bridged by a single lightweight iron element attached to the innermost end of the cantilever. As the stylus moves the cantilever, the element moves between opposed magnetic flux gaps, creating an increase in flux in one gap and a decrease in the opposite gap. The change in flux generates voltages in the coils.

¹ See www.analogplanet.com/content/analog-corner-44.

Grado says that the four magnetic gaps create an efficient and perfectly balanced generator, and that, thanks to more efficient magnets and other developments, its coils now require fewer turns of wire to produce a given output voltage than do other systems. The result is lower overall mass and electrical inductance, which makes phono-cable capacitance far less of a problem than in typical moving-magnet designs.

While the lower-cost Grados have a telescoping, multi-alloy cantilever whose hollow and solid sections are bonded together, then coated with a damping material, the Epoch's cantilever is made of solid sapphire—a first for Grado. A sapphire cantilever isn't necessarily costly: Ortofon's Quintet S cartridge has one, and costs only \$999. Grado gets its sapphire cantilevers from a "standard supplier," then individually heat-treats each one and coats it with a special damping material.

The Epoch's diamond stylus, which Grado says is "specially" made for them, looks similar in shape to the variable-radius, line-contact styli of the flagship models from Audio-Technica, Dynavector, and Lyra, with one easy-to-spot difference: While the styli in

all of those cartridges are attached to a mounting plate that is then attached to the cantilever, Grado's stylus is affixed directly to the cantilever—there's no plate, which must slightly reduce the mass. It looked neatly and symmetrically done, without the gob of glue sometimes seen.

As in other MI cartridges, the Epoch's generator doesn't require the cantilever to teeter-totter on an elastomer pivot, with the stylus at one end and the generating element at the other. Instead, the cantilever terminates in a fixed axial pivot that supports the entire cantilever.

The ultra-light moving element is attached to the end of the cantilever at the axial pivot, and so its relatively smaller movement than seen in a cantilever with a teeter-totter pivot is theoretically more immediate, and arguably more linear and precise, than the movements of coils or magnets—which, in a typical system, are a greater distance from the pivot point and thus move farther. Anyway, that's according to Grado. We all know of *many* great-sounding teeter-totter cartridges.

Each Epoch and Aeon is hand-built by John Grado using coil-winding

techniques passed down from Uncle Joe. Each of the four coils is wound, Grado says, of "the finest properly sized and annealed 24-karat solid gold wire, which is the ultimate conductor for the transmission of the music from your record." All parts of the Epoch's magnetic circuit are "Swiss screw machined or molded metal, which have tolerances on the order of the best Swiss-made watches."

Nothing in the Epoch, John Grado assured me, is an off-the-shelf part. The magnet is formed and shaped to Grado's specifications, with all magnetization done in-house. The front and rear metal poles in the magnetic circuit are molded from powdered metal, while the 16 other parts in the circuit are manufactured on "Swiss screw machines and heat treated."

Grado buys raw rubber to make the grommets used in the Epoch's suspensions. First they cure the rubber for more than two years, then mold it into thin sheets, from which they punch out grommets of the desired size.

Grado claims that the Epoch and Aeon "feature a unique system that has the lowest effective moving mass of any cartridge." The new generator

system is housed in an unusually large body of cocobolo wood, the body's shape and weight also contributing to the sound quality, per Grado. Cocobolo is a superhard wood from tropical Central America, so dense that it doesn't float. Grado carefully damps the body with four different materials, and a good thing too—when struck sharply, a cut block of cocobolo will produce a clear musical tone, which is why it's sometimes used instead of the usual grenadilla, or African blackwood, to make oboes, clarinets, and bagpipes.

How to install a \$12,000 cartridge ...

Very carefully!

I first installed the Epoch in the Reed 3P tonearm.² It proved an outstanding match. The combination's vertical and horizontal resonant frequencies were about 8Hz. I used the CH Precision P1 phono preamplifier in MM/MC mode,³ and, using its test record and setup wizard, 47k ohms provided a ruler-flat response. (A 47k ohm load-



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ing is more of a "convenience" default setting for a MM phono preamp than necessarily the correct setting for every MM or MI cartridge.) The P1's setup wizard suggested 65dB as an optimized gain.

For the Lineage Epoch, Grado specifies an output of 1.0mV; a frequency response of 5Hz–75kHz; average channel separation of 33dB, 10Hz–30kHz; inductance of 8mH; resistance of 90 ohms; and a mass of 12gm. The recommended vertical tracking force (VTF) is 1.5–1.9gm.

One issue that must be addressed with a low-output MI that produces the flat-test *measured* response when loaded at 47k ohms is the choice of phono preamplifier. If your phono preamp offers only low impedances for

² See my review in the November 2017 "Analog Corner."

³ See "Analog Corner," April and June 2017.

its MC input(s), you're probably out of luck—or at least you won't maximize the Epoch's performance. That's also probably true if your MC input is transformer-coupled, depending on what resistive load the cartridge would "see." You could try the Epoch into the MM input of your phono preamp (if it has one), but with this cartridge's 1.0mV output, chances are good that you'll have a problem with noise with the 40–45dB of gain offered by most MM preamps.

In any case, I'm once more glad that I withdrew a hefty amount from my retirement fund to buy the CH Precision P1/X1 (\$48,000, combined). It's the perfect phono preamplifier (though not the only one) to use with this ultra-high-performance cartridge.

In the Reed 3P tonearm, the Epoch tracked best at 1.8gm. I measured 30dB of separation with a difference of 0.5dB between channels with the cantilever's azimuth just a sliver to one side of perpendicularity. The stylus rake angle (SRA) was 92° with the 3P slightly below parallel to the record surface. In other words, you get the build integrity and measured performance you should get for your \$12,000.

The Epoch's cantilever is tucked *way* back in its cocobolo body. This means that the cantilever and stylus are well protected against mishaps but it also makes alignment tricky, particularly zenith angle.

Sound

I hadn't listened to a premium Grado cartridge in a long time. My 1999 comment quoted at the beginning of this column might have been the last thing I'd written about one. While the Grados of that era were tonally neutral, smooth, and worthy of respect—and, like the Shure V15xMR, tracked really well compared to their MC contemporaries—they were kind of boring.

The Grado Lineage Epoch was the opposite of boring. Fresh out of the box, its sound was close to "Wow!" After proper setup and about 50 hours' worth of break-in, it was "Wow!"

The Epoch thrived in the smooth—and somewhat rich-sounding Reed 3P arm, but really came alive and into ideal focus in Graham Engineering's new Phantom III, (about which more next month).

First, the Epoch took the tracking of grooves to new levels of quiet. It glided silently and smoothly through the groove like no other cartridge I've

heard—as if every record I played had been treated with Gruv Glide or some other dry lubricant. The Epoch sailed through the "Tracking ability" bands of the recently reissued *Ortofon Test Record*, which contain a 315Hz test signal recorded at increasing peak amplitudes, up to lateral modulations of 100µm.

Better yet, what emerged from the "black" void combined what sounded to me like a smooth, flat frequency response with exceptional transparency—the kind of nonmechanical sound you hear from strain-gauge and optical cartridges.

The Epoch's reproduction of transients was nearly ideal. It avoided the overly soft, burnished attacks and polite upper frequencies some cartridges produce in the service of "easy" listening and romanticized versions of what music actually sounds like. At the same time, it completely dispensed with unnaturally hard edges, mechanical brittleness, and high-frequency bleach.

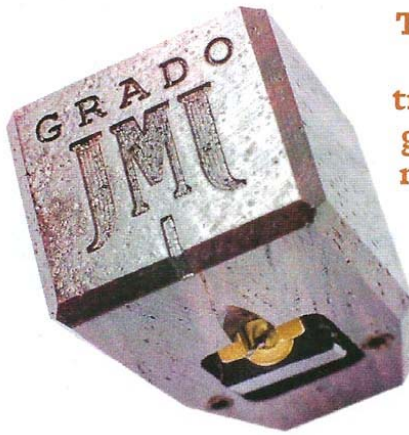
The Epoch's bottom end was full-bodied, very well controlled, and free of romantic midbass bloat. Its starting and stopping abilities in the low end were among its most impressive qualities, and helped produce its quiet backgrounds. Yet the bass was not overdamped.

With the 30dB, ±0.5dB of channel separation I measured, you might expect a wide, deep soundstage, and that's what I heard. On those stages were solid, well-focused images of natural specificity. I just wanted to lean into those pictures to take it all in.

What the Epoch did in decoding Cécile McLorin Salvant's absolutely superb *Dreams and Daggers* (3 LPs, Mack Avenue MAC 1120LP), mostly recorded live at the Village Vanguard, was nothing short of hair-raising and astonishing. This album was engineered last September by Valve Tone (aka Damon Whittemore) and Todd Whitelock, both of whom have impressive résumés (for Valve Tone's, see www.valvetone.com). It puts the listener pretty close to the stage. Salvant's trio—pianist Aaron Diehl, double bassist Paul Sikivie, and drummer Lawrence Leathers—are respectively arrayed at the left, center, and right of the stage.

This warm, intimate recording is destined to be a classic, like the two famous Bill Evans sets recorded at the Vanguard almost 60 years ago. What the Lineage Epoch did with it was magical in every respect: tonally,

spatially, dynamically, however you want to judge it. The sassy, exuberant Salvant began to sing, and she was right *there* in 3D, as solidly placed in front of the trio and as believable as any live recording I've ever heard. The textures of her voice were silky and natural. The ambience of the club seemed to envelop and surround her, as if heard live. Her sibilants sounded natural, 100% nonmechanical. The double bass's attack, sustain, and decay just sounded *right*—no need to analyze. If the drums were a bit warmer than live, so what? The rest was so convincing and nonmechanical that I could sit back and feel as if I were at the show.



The Epoch took the tracking of grooves to new levels of quiet.

Dreams and Daggers, mastered for vinyl by Kevin Gray from high-resolution digital files and pressed at RTI, is so good it might sound as convincing played through a Crosley Cruiser, for at least one play. Okay, that's hyperbole.

Playing this album with the Lyra Etna SL (\$9995) or Atlas SL (\$12,995) provided somewhat different but equally convincing tonal and spatial perspectives. It was like the difference between the CH Precision P1 (\$31,000) and, say, the Audio Research Reference Phono 3 (\$14,000).⁴ The Etna through the Phono 3 probably would sound similar to the Epoch through the CH Precision. I don't think I'd like the Epoch into the Ref 3. Too rich! But your experience, system, and taste might make that combo just right.

My point is one I always try to make to people who wonder why anyone would want to hear vinyl pressings of digital masters: It's *your* system, and what's "right" really is how you wish to hear it. However, given the option to have both approaches, I'd go with the Epoch for classical and jazz, though it was more than great with *The Clash*

(CBS 82000) and Eric Clapton's *Unplugged* (2 LPs, Reprise 468412-1). For rock, percussion, and bluegrass—and particularly the midbass, where kick drums reside—I'd go for the somewhat leaner, faster, more dynamic Etna SL or Atlas SL. But again, the Salvant album was convincing and thrilling through the Lyras.

Conclusions

There is no perfect cartridge or loudspeaker or anything else in audio—not even a DAC. While Grado Labs' very costly Lineage Epoch doesn't give you *everything* (you can get better overall dynamic slam and greater bass dynamics, for instance, from a few other cartridges), it is a dazzling- and exceptional-sounding performer that also measures well. Its overall musical balance is as knowing, sophisticated, and musically involving as that of any

cartridge I've heard.

The Epoch did things I hadn't heard any cartridge do, especially in terms of how smoothly and quietly it tracked the groove, its remarkable freedom from mechanical artifacts, and a harmonic and textural richness laid on without too thick a coating of aural honey. It had enough bite to make brass convincing, cymbals sizzle, and air abundant, where appropriate.

The Lineage Epoch is obviously a labor of love for John Grado. If you want it, you'll pay dearly for it. Here's hoping that the Lineage Aeon, to arrive in the next few months, will be able to produce 75% to 80% of the Epoch's greatness at half the price. But for now, install the Epoch in the right system, put on an LP of the right music, sit down . . . and you're done. ■

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⁴ See my review in the January 2017 "Analog Corner."

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