

Michael Fremer

Danish Adventures & the Oracle Turntable

Though it rained throughout the week I was in Denmark last fall, the trip couldn't have been more enjoyable or worthwhile. After I'd landed in Copenhagen, my hosts took me on a day-long tour of the opulent "Whiskey Belt" coastline, which stretches more than 100 miles north of the capital city, along the shore of the Øresund, the sound that separates Denmark from Sweden. It's where Denmark's rich and famous live and play.

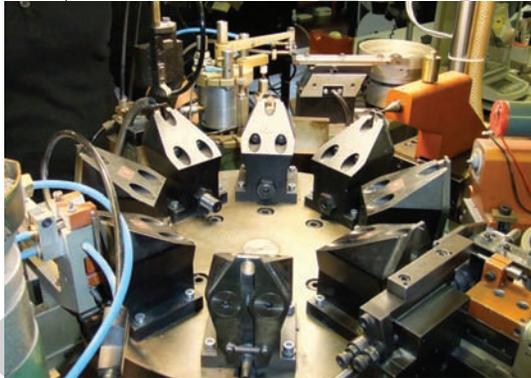
We passed Rungstedlund, formerly the family estate of Karen Blixen (aka Isak Dinesen, author of *Out of Africa*) and now a museum, along with hundreds of other opulent homes—although, by Miami standards, most were modest and tasteful. We were on the way to Kronborg Castle, better known as "Hamlet's Castle," in Helsingør (Elsinore), where the Baltic and North Seas meet. Shakespeare wrote his play around 1600; the forbidding-looking castle had been completed only 15 years earlier.

Next day it was off to Næskov, a two-hour drive from Copenhagen past seemingly endless sugar-beet fields, where I met up with Leif Johannsen, Ortofon's chief officer of acoustics and technology, for a factory tour. Ortofon had been pleased with my review of the \$4200 MC A90 cartridge in November 2009, and when Johannsen found out I was attending Copenhagen's Hi-Fi & Surround 2009 show to promote my two vinyl-related DVDs and present five turntable-setup seminars, he arranged for this side trip, for which I flew out a few days early.

Ortofon, founded in 1918, is relatively large for a 21st-century company specializing in making phono cartridges, employing 65 people in a two-story workspace. The company's expertise in rubber fabrication and parts manu-



PHOTOS: MICHAEL FREMER



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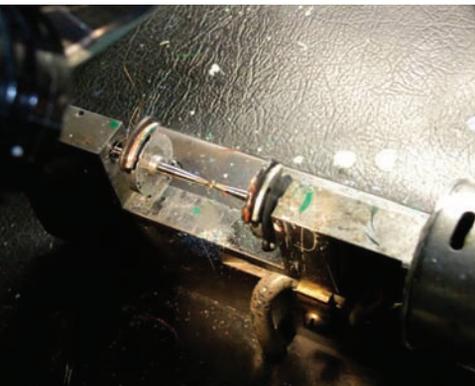
facturing provided a cushion during analog's lean times. Nonetheless, cartridges still represent about 60% of Ortofon's business, with a significant portion of that being on the DJ side. The firm's heart and soul, however, remain rooted in hi-fi.

Ortofon makes all its own dampers—

those tiny rubber donuts that form the basis of cartridge suspensions. In fact, as Johannsen showed me, the formulation of the rubber, as much as anything else, is what determines a cartridge's compliance. I watched finished damper produced from the raw rubber, to which is added various compounds that determine the final product's compliance characteristics. The material is passed repeatedly between heated cylinders in a device resembling a pasta maker, until the additives have blended with the base component. Wads of the result are placed in molds, which are then closed, heated, and compressed. At the end of the cycle, the mold is opened and out pop hundreds of tiny dampers—or long, hollow tubes—or hearing-aid inserts—or whatever the mold dictates.

All of Ortofon's intricate cartridge assembly is done by women. Downstairs they build moving-magnet cartridges for hi-fi and DJ-ing. Moving-coils are built upstairs. Even the least expensive cartridge is assembled from many tiny parts and requires much handwork.

I saw Ortofon's proprietary MM coil winder (I wasn't allowed to photograph it), and a series of machines that duplicate some of the hand assembly work being done at nearby workstations. From a single strand of wire, the winder produces two precision-wound coils separated by a straight segment of wire. A worker then places each pair of coils over a previously assembled plastic frame, out of which protrude, on one side, four long posts; and, on the other, four terminals. The coils are carefully fitted over the posts, and the wires are drawn through the other end and connected to the terminals. A plastic cap is fitted to the top of the assembly to secure the posts. After the four colored wires are attached to the pin ends, a mu-metal shield covers



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the entire assembly. For Ortofon's Concorde DJ series, the subassembly is fitted into a long plastic form with an integral finger lift. The wires are then connected to an integral bayonet connector that's press-fitted into the plastic form.

At another workstation, an operator places in a holder a tiny cantilever-stylus-damper assembly, into the rear of which a machine has inserted a tiny magnet. Using an microscope with a crosshatched screen, the operator aligns the stylus's azimuth within a plastic assembly. This piece of plastic—an MM cartridge's familiar removable/replaceable stylus assembly—is then inserted into the front end of the otherwise assembled cartridge. The result: a finished Concorde. For all of this precise, time-consuming work and the parts that go into it, the plug'n'play Concorde with two styli sells for \$249, and can be found online for less than half that.

Upstairs, I watched more workers making MC cartridges. This includes the hand-winding of coils over tiny armatures and under microscopes by highly skilled workers, and all the rest that goes into making these more costly designs. I watched the production of the new Cadenza line of MC cartridges,

each of which is tested in a tonearm fitted with a special jig for easy mounting and dismounting. No A90s were being built during my visit, but still, what I saw during my visit to Ortofon was impressive. Having the infrastructure, left over from analog's heyday, for machining and crafting parts of rubber puts the company in an enviable position in terms of both quality and pricing.

While with the A90 Ortofon seems to have perfected its current and long-standing MC technology, other companies are now using yokeless designs with ring or disc magnets, which are said to produce more symmetrical magnetic fields and, therefore, lower levels of distortion. Johannsen assured me that Ortofon would not be left behind as vinyl playback continues to grow in the 21st century, as he and I expect it will—which is not to imply that any cartridge I've heard has left the A90 behind. I bought one as a reference.

Late that afternoon we drove and car-ferried another few hours to Odder, near Århus, Denmark's second largest city and a college town similar to Boston. I spent the next day at Johannsen's home laboratory listening to music on his custom-built, excellent-sounding, three-way active loudspeakers, and looking through his electronic "stuff." We ended the day by shopping for LPs, first at an Århus thrift shop, and then at an excellent new- and used-record store. Finally, he dropped me off at the station for the long train ride back to Copenhagen, where, in first-class comfort, I caught up with e-mails via my iPhone and the train's complimentary WiFi.

The next day, at Hi-Fi & Surround 2009, I did three turntable-setup seminars sponsored by Audionord, the Danish importer of my two DVDs. Two were very well attended; the third, late on Saturday afternoon, not so much,

but I'd expected that. On Sunday I played to two more packed houses.

When I do these seminars in America, I begin by telling people to be sure to be in a good mood when setting up a cartridge; it's an often frustrating experience, and there's no point in starting out grumpy. In my case, I tell people that means *not* watching Fox News, which always gets a laugh. Standing before an audience of Danes, all of whom spoke excellent English, I debated about using the line, then figured, what the hell, the worst that could happen is no reaction. But the Danes laughed as heartily as do American audiences. The joke's on *you*, Roger Ailes! Speaking of politics, my local newspaper, *The Bergen Record*, finally tired of publishing so many letters by me, threw in the towel, and gave me my own political blog. Check it out at <http://blogs.northjersey.com/blogs/fremer>. (There's plenty of audio in there too.)

I met a lot of *Stereophile* readers at the show, which was at least as well attended as any *Stereophile* show or Rocky Mountain Audio Fest, and was surprised by how many knew me by sight. It was great to get out of my basement for a while! (See this link for some show coverage; the text is Danish, but you can look at the photos: <http://www.hifi4all.dk/content/templates/besogsartikler.asp?articleid=2244&zoneid=4>.)

I spent the next day with Audionord's Mark Johannsen, visiting the Copenhagen zoo and a few hi-fi stores. We did some sightseeing downtown, and after dinner it was back to the hotel for a quick crash.

I got up at 5am, wheeled my overloaded bag (I'd bought some LPs, of course) to the train station, and took the first train to the airport. I was home by three that afternoon, a few hours short of a full week away. I'd been on the go the entire time, and had done more

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seminars than I ever had in a single weekend, but arrived home relaxed and refreshed. Analog will do that for you!

Oracle Delphi Mk.VI turntable

Thirty years have not diminished the beauty and elegance of Oracle's Delphi turntable. In my opinion, it still ranks among the best-looking turntables ever made. I bought an original Mk.I, used, in 1982, and very positively reviewed the Delphi Mk.V in the December 1997 *Stereophile*.

In its three decades the Delphi has undergone many upgrades both technical and aesthetic. Not surprisingly, so has the price. The Mk.II Delphi sold for \$1250 in 1986; the Delphi Mk.VI with Turbo power supply and dedicated power cord now sells for \$8500, which, in today's market, I think is reasonable for what you get. The review sample came with an Oracle/SME 345 tonearm (\$3100) and a Benz-Micro Thalia high-output MC cartridge (\$1700), for a total cost of \$13,300—or \$11,600 for just table and arm.

Born beautiful, the Delphi has become only more so—the fit and finish of

the Mk.VI are flawless. The aluminum surfaces, coated in high-gloss polyester, gleam brightly and are smooth under the fingers. You'll *like* looking at and touching it.

But the Delphi has also had many technical difficulties, beginning with the offset weight of the tonearm, which, in earlier models, made it difficult to get the three-point spring-based suspension to behave pistonically. LA retailer Brooks Berdan elegantly solved that problem with a modification consisting of a U-shaped weight affixed to the underside of the chassis opposite the arm-mount ring. Oracle eventually included a similar feature in their design. While a spring still constitutes the main suspension component, each of the Mk.VI's three suspension towers includes more than a half-dozen elements, including parts made from felt, Sorbothane, rubber, and Delrin.

Oracle has made a series of changes to the basic design over the years to, among others, the motor (formerly DC, now AC synchronous), the power supply, the subchassis (it's now more massive), the arm mount (an aluminum

sandwich now replaces the original acrylic wafer), a heavier platter (though still of aluminum), the bearing (it's now wider), and the integral polymer mat).

The Mk.VI's aluminum subchassis is the most massive yet; it's thicker, and, to improve resonance control, has been redesigned to shorten the arms that extend to the three posts from which it's suspended. Oracle has also widened, by about 35%, the width of the support for the tonearm mounting ring, thus increasing the rigidity of the mount system.

The Mk.VI's spindle bearing retains the Mk.V's contact system, wherein six nylon-tipped setscrews protrude through the bearing housing to contact the bearing. Each platter bearing and housing must therefore be individually calibrated as a system. In the Mk.VI, Oracle has changed the screws to a material less sensitive to variations in temperature, thus making possible greater accuracy and tighter tolerances. The thrust pad is of a new polyamide-imide plastic said to have the greatest strength and stiffness of any thermoplastic made. This is claimed to increase resistance to

wear and decrease rotational noise.

The Delphi Mk.VI includes a few other minor tweaks, but the greatest improvement Oracle has made to the Mk.VI, and probably to any iteration of the Delphi—an improvement claimed by Oracle and easily audible to me—is the new Micro Vibration Stabilizer System. In essence, this adds shock absorbers to the spring suspension system. The system consists of a cup, half-filled with silicone fluid of extremely low viscosity, located next to each of the three suspension towers. A lockable Delrin plunger, threaded and tapered, is attached to the subchassis bottom directly above each cup. This can supply very precise amounts of damping, depending on how deeply into the fluid the plunger is . . . plunged.

While a properly designed, spring-suspended subchassis can do an outstanding job of isolating the turntable from floorborne vibrations—and, to some degree, airborne ones as well—it creates its own problems. No matter how well machined the platter and bearing, some amount of wobble will be produced when they rotate. This can set

the spring suspension in micromotion, producing lateral displacements that can vary the distance between the platter and motor pulley, and thus affect the stability of the platter's speed of rotation. In a spring-suspended system, such lateral and/or vertical microdisplacements can also result when an LP with an off-center hole causes the tonearm to make otherwise unnecessary lateral movements. In addition, the microvibrations created by the stylus tracing the groove modulations travel in two directions: down into the platter and subchassis, as well as up into the tonearm, by which means they can even reach the arm bearing. If there's play in that bearing, those vibrations can travel back along the tonearm to return to the stylus.

Oracle's Micro Vibration Stabilizer

silicone damping system was designed to diminish, as much as possible, *all* of these potential problems without reducing the spring suspension's effectiveness. It sounded as if it was working as intended. I could hear the Delphi Mk.VI with MVSS system engaged or not by rotating the three Delrin paddles in and out of the silicone and listening



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each way. Oracle says that 3.25 turns' worth down into the fluid sounds best. I took their word for it and compared that setting with 0.0 turns.

The suspension's ability to isolate the system from vibration remained constant whether the damping was applied or withdrawn. But when damping was applied, the overall sound became more solid and better organized. In particular, the bass was tighter and faster, images were more finely focused, more compacted and solid, and more low-level detail emerged.

I listened first as Oracle's Jacques Reindeau installed the Delphi Mk.V with the SME arm and Benz-Micro Thalia cartridge. It didn't take long to hear that while the cartridge was okay, it was somewhat soft-sounding, producing images that were less than precisely defined, and too large and billowy. In short, unless that sort of big, warm, "analog-y" sound is what you like—and I don't—it wasn't a good match for the Oracle. Something faster, tighter, and leaner was called for.

I began with the Lyra Helikon SL. That cartridge greatly tightened and speeded up the sound, producing fast, clean transients, a reasonably supple midband (though in this regard the Thalia was better), and deep, well-defined, rhythmically certain bass. And at about \$2800, the Lyra's price is still not out of bounds for use with an \$8500 turntable. This combo was remarkably quiet, with a bottom-end foundation more solid and tightly focused than I'd expected from a spring-suspended design. Still, a mass-loaded design will produce more slam, if perhaps at the expense of a somewhat elevated noise floor.

Although the Delphi Mk.VI sports a sophisticated suspension system, it surely didn't hurt that it was sitting on my Harmonic Resolution System SXR rack and S1 isolation base. The platter's speed is adjustable, and it was easy to set it precisely. The 'table began to run slightly fast during my third week of listening, probably as the bearing broke in. After a single adjustment, it remained precisely at 33.33 and 45rpm for the rest of the review period. The pitch was subjectively steady and difficult to fault, at least concentric records. But I kept coming back to how "black" the backgrounds were. That new thrust pad and the tighter bearing tolerance must be the reason.

I'd lucked into a 1975 set of Prokofiev's piano concertos 1–5, performed by Vladimir Ashkenazy, with André Previn conducting the London Symphony, and recorded at London's Kingsway Hall by Arthur Lilley, Kenneth Wilkinson, and Phil Wade, on UK Decca LPs. This set allowed me to explore the Delphi Mk.VI's ability to reproduce a very-well-recorded piano in front of a well-recorded orchestra, captured in a superb-sounding hall by engineers who gave the venue enough space to breathe life into the sound—all as I listened to fiery, exciting music.

The Oracle-SME-Lyra combination produced a big, slightly warm orchestral sound. String tone was rich, with a pleasing golden glow. The piano's lower register was cleanly rendered and remained well defined against the hall's reverberant field. The upper keyboard sounded supple, with a rich, woody, yet sparkling bite. Image stability and solidity were never in question, and the



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system's dynamic punch announced a turntable that seemed in complete control. Moving up to Lyra's Titan *i* cartridge further refined the sound.

After recording, at 24 bits and 88.2kHz, a track from a 180gm vinyl edition of Art Pepper's *The Way It Was* (Mobile Fidelity Sound Lab MFSL 1-297), I swapped the SME arm for the Graham Engineering Phantom 2 with Lyra Titan *i* and recorded the track again. After listening to the same pile of records and drawing conclusions, I then directly compared my two recordings of the Pepper track and heard the same things. It should be no surprise, given its heritage, that the SME 345 is a really good arm, particularly in terms of tonal balance. The Graham Phantom 2, however, produced far greater image solidity, as well as cleaner, faster transients, with an overall improvement in clarity, focus, and harmonic coherence.

With the improvements in the bearing, and especially with the addition of the silicone damping system, the Mk.VI edition not only retains the Oracle Delphi's position as one of the most beautiful turntables in the world; it re-establishes it as a formidable contender in and well beyond its price class.

Sutherland Engineering Timeline

Ron Sutherland has devised the **Timeline**, a device for testing the 33.33 and 45rpm speeds of turntables. It's housed in a disc of aluminum and Delrin that fits over the platter spindle. Turn it on, and an LED shoots a red dash of light at the wall (if there is one) behind your turntable. If the dash doesn't move, the speed is correct. If it drifts to left or right, you'll need to adjust the 'table's speed. Unless your wall has hash marks, there's a bit of subjectivity involved, and at \$400 the Timeline isn't cheap, but Sutherland says he's not making much money at that price, and that it will take a lot of sales to recoup the R&D he's put into designing something as precise as he claims the Timeline is. ■

IN HEAVY ROTATION

- 1) *Love, Love Lost, Sundazed* 180gm LPs (2)
- 2) *The Twilight Hours, Stereo Night, Princess/Songcraft* Supreme LP
- 3) *Sam Cooke, Nightbeat, RCA/Analogue Productions* 180gm 45rpm LPs (2)
- 4) *Nat King Cole, The Nat King Cole Story, Capitol/Analogue Productions* 180gm 45rpm LPs (5)
- 5) *Diana Krall, All for You: A Dedication to the Nat King Cole Trio, GRP/ORG* 180gm LPs (2)
- 6) *Hank Mobley, Roll Call, Blue*

- Note/Music Matters 180gm 45rpm LPs (2)
- 7) *Elbow, The Seldom Seen Kid, Geffen/Mag International* 180gm 45rpm LPs (2)
- 8) *James McMurtry, Live in Europe, Lightning Rod LP*
- 9) *Elvis Costello, My Aim Is True, Stiff/Mobile Fidelity Sound Lab* 180gm LP
- 10) *Quicksilver Messenger Service, Happy Trails, Capitol/Pure Pleasure* 180gm LP

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