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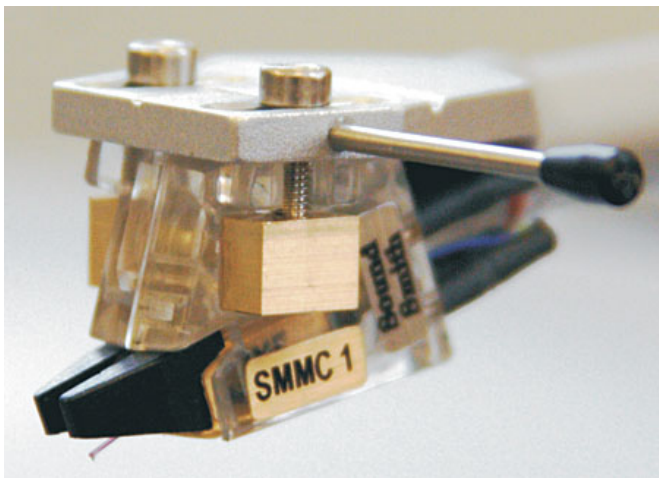
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## PHONO CARTRIDGE REVIEWS

# Soundsmith SMMC1 moving-iron phono cartridge

By Michael Fremer • Posted: Apr 25, 2008

The audio industry may have lost a legend and a prolific innovator in [Henry Kloss](#) a few years back, but it still has another affable, creative eccentric in [Peter Ledermann](#). In the mid-1970s, Ledermann was director of engineering at [Bozak](#), where, with Rudy Bozak, he helped develop a miniature bookshelf speaker and a miniature powered subwoofer. Before that, Ledermann was a design engineer at RAM Audio Systems, working with Richard Majestic on the designs of everything from high-power, minimal-feedback power amplifiers and preamplifiers to phono cartridge systems. He was also an award-winning senior research engineer at IBM, and the primary inventor of 11 IBM patents.



Somehow, more than 35 years ago, Ledermann also found time to start The Soundsmith, which he calls an "audio mentoring" company—one that teaches audio engineering in an arrangement that sounds like a cross between an apprentice program and a school, the tuition subsidized by the repair and restoration of hi-fi gear. Students learn and earn by doing. Fifteen years ago, Ledermann left IBM to devote himself full-time to Soundsmith. When not mentoring, he designed, manufactured, and marketed strain-gauge cartridges, preamps, amplifiers, loudspeakers, and subwoofers.

Never heard of Ledermann or Soundsmith? You're not alone. On the first page of the Soundsmith catalog, Ledermann acknowledges his company's low visibility: "We don't get out much." Like Henry Kloss, Ledermann isn't wired for business or for image-marketing—Amar Bose he's not. Also like Kloss, Ledermann is more a dreamer and idealist than a schemer.

That catalog, for instance: While filled with an extensive line of electronics, and loudspeakers that always sound impressive at trade shows, its production values reek of Kinko's. The exception is a slick-looking ad tacked on at the end, for the CDT-4 automated CD player tester—an ingenious and seemingly useful electronics repairperson's trouble-shooting tool that Ledermann invented in his spare time.

Visit Ledermann's repair and production facility in Peekskill, New York, and you'll find yourself negotiating canyons of vintage gear stacked on shelves from floor to ceiling. Some of it awaits repair or restoration, but a lot of it is there "just because"—this isn't how businesses usually operate, but it sure gives Soundsmith personality.

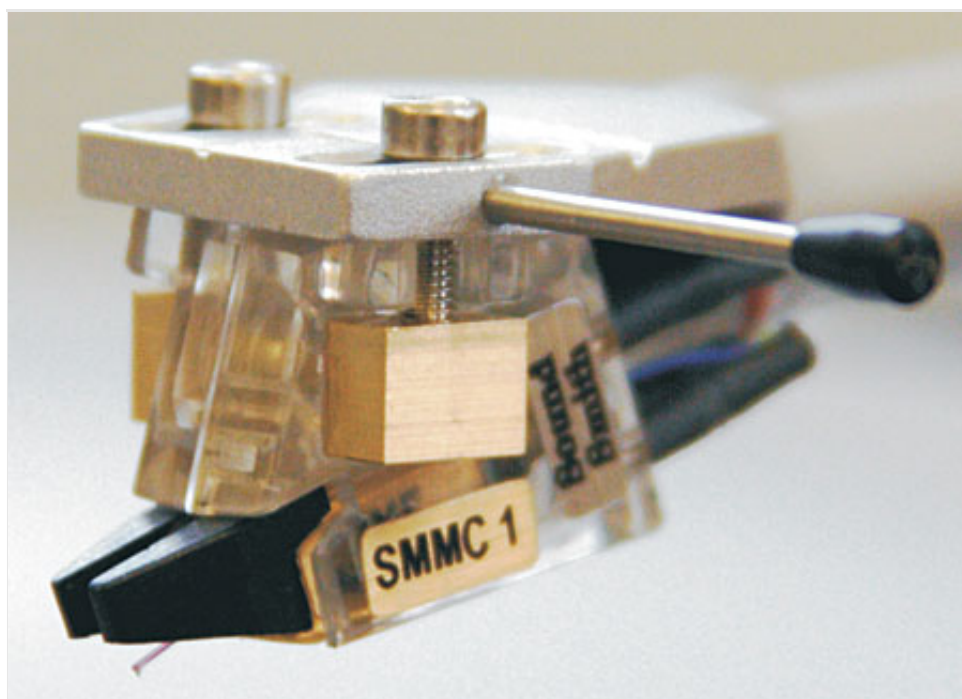
Soundsmith also specializes in repairing electronic and mechanical products from such Scandinavian companies as Tandberg and B&O. Repeated contact with disenfranchised B&O turntable owners unable to get replacements for B&O's proprietary but long-discontinued moving-iron plug-in cartridges inspired Ledermann to contact B&O and seek permission to make them himself.

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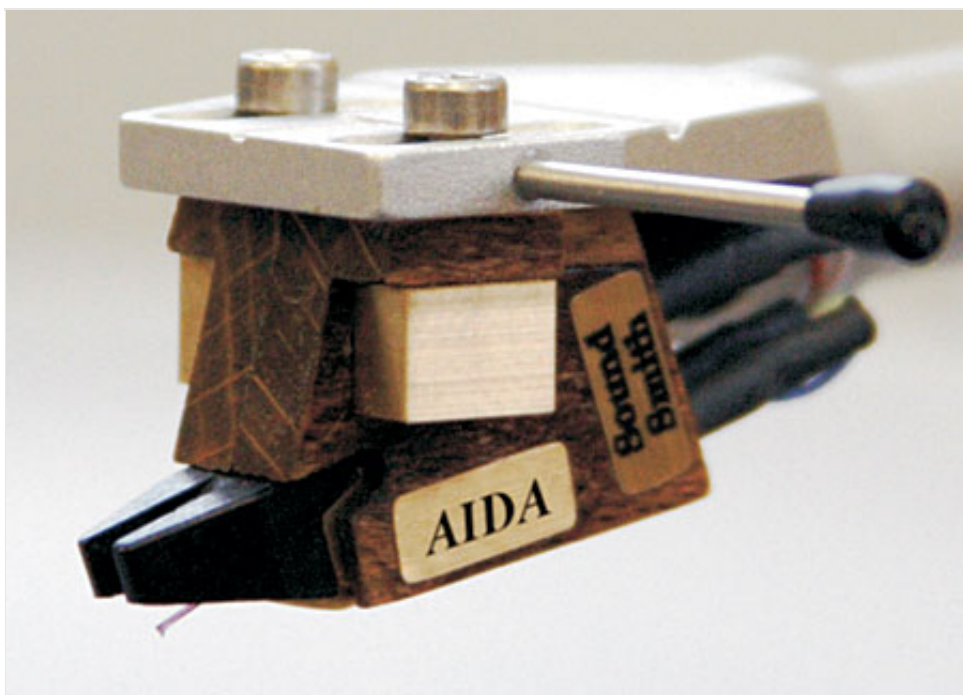
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But that's precisely what Ledermann did. His plug-in (akin to P-mount) clones of B&O's original cartridges are now available in a variety of configurations, and continue to sell very well to owners of B&O turntables worldwide.



After the first rush of orders, when demand had begun to taper off, Ledermann designed a universal mounting adapter for B&O's MMC series, which he calls the SMMC series: from the SMMC4 with diamond elliptical stylus and aluminum cantilever (\$149.95), to the top of the line, the limited-edition The Voice (\$1599.95), with ruby cantilever, nude contact-line diamond stylus, lower-mass moving iron, and the closest-tolerance measurements. The Voice is built not by Soundsmith's usual team of skilled cartridge crafters but by Ledermann himself. Prior to the introduction of The Voice, the SMMC1 (\$749.95) reviewed here was the top of Soundsmith's cartridge line, as had the MMC1 been the top of B&O's.

### **MMC = Moving Micro Cross**

In a typical moving-magnet (MM) cartridge, a tiny permanent magnet, attached to the cantilever and positioned between two sets of fixed coils inside the body of the cartridge, induces a tiny current in the coils when it is vibrated by the stylus's motions as it navigates the record groove. In a moving-coil (MC) cartridge, the magnet is fixed; it is the coils attached to the cantilever that move. The mechanical and electrical advantages and disadvantages of both designs are best discussed elsewhere.

Moving-iron designs such as the SMMC1, or the Grados, use stationary coils and magnets and a small piece of "moving iron." In the original B&O design, what moves is a cross-shaped piece of ultra-low-mass, high-purity iron attached to a soft elastomer damper stabilized in a plastic frame. The iron also incorporates a minuscule tube into which the cantilever is inserted. Each arm of the iron cross is associated with a fixed-coil/magnet structure and as the cantilever moves, it varies the distances between the four arms of the iron cross and the four fixed-coil/magnets, thus inducing tiny voltages within the coils. The advantages of this arrangement include ultra-low moving mass, even compared to an MC design; relatively high output (because the stationary magnet/coil structure can be made large); high suspension compliance; and low vertical tracking force (VTF).

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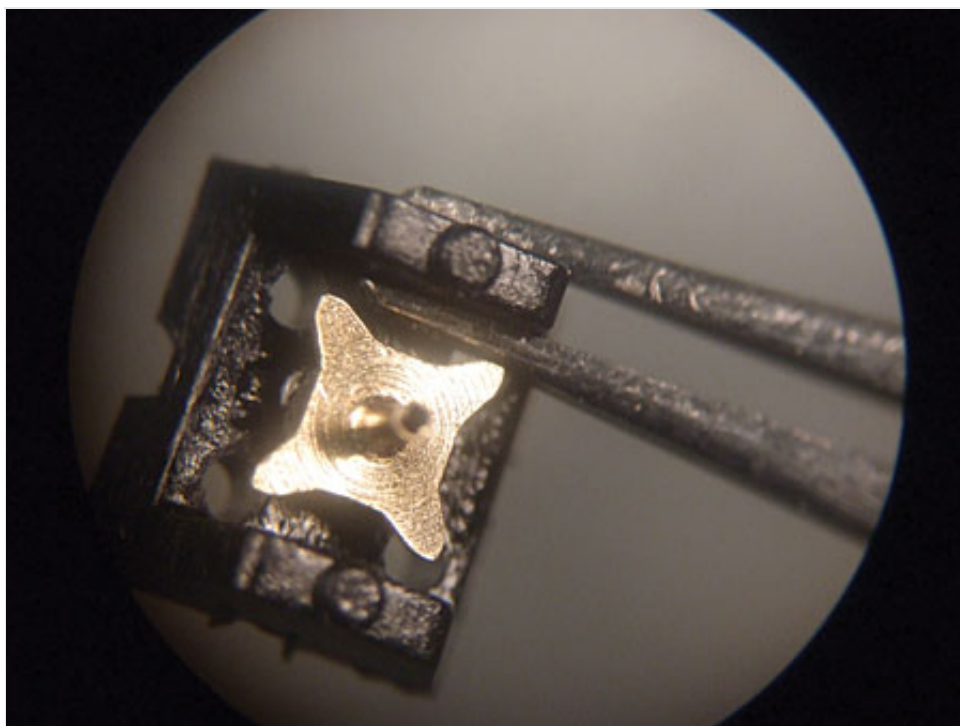
The SMMC1's one-piece cantilever is made of ruby to which is attached a nude line-contact diamond stylus with a tip of very low effective mass (0.32mg). The compliance, 28 $\mu$ m/mN, is moderate to high. The SMMC1's frequency response is cited as 20Hz–20kHz,  $\pm$ 2.5dB, while its channel separation at 1kHz is greater than 25dB and its channel matching within 1.6dB or better. (The Voice's channel balance is specced at better than 0.5dB.) The recommended resistive loading is 47k ohms, while the recommended capacitive loading is equal to or greater than 400pF, including the capacitance of the tonearm cable. Soundsmith recommends a tracking force of 1gm.

Though the SMMC1 is intended for use with an MM phono preamp, its specified output is a relatively moderate >2.12mV at 5cm/s. (A typical MM cartridge's output is 4.5mV.) And while the cartridge itself weighs only 1.6gm, the addition of Soundsmith's universal mounting adapter of clear plastic brings the total to about 6.8gm.

### **Building the SMMC1**

A get-acquainted visit to Soundsmith late last summer turned into a hands-on tutorial when Ledermann sprang a surprise: Would I like to build my own cartridge?

Of course! Under the expert supervision of a veteran Soundsmith cartridge builder, I learned to cold-weld, though he told me the chances were slim that I'd be able to actually accomplish the mini-welds needed to secure the ends of the coil wires—which must be done while viewing one's progress through a microscope. But I managed it.



The next step was to carefully and evenly slide the moving-iron assembly's plastic frame (its four tiny holes are produced during the molding) onto the locating rods that jut from the coil/magnet housing, and stop it the correct distance from the coils—*before* the instant-set glue hardened. That took more than a few attempts, but eventually I got it right. Ledermann then took the assembly to his workstation and installed the cantilever and stylus assembly into the moving iron's tiny tube.

### **Installation and Optimization**

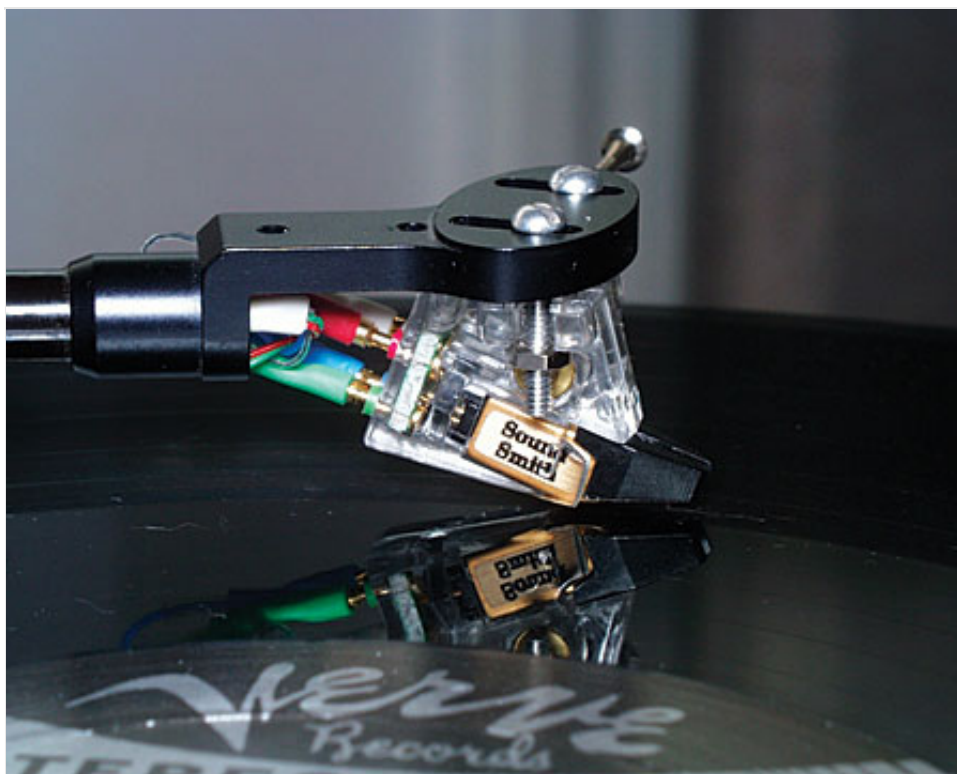
Installing the SMMC1 requires a bit of extra care—there's no stylus guard, though if you're worried about damaging the cantilever, you can unplug the cartridge from the adapter and install just the adapter (which is not tapped, but secured with tiny nuts). The plug-in ability also means you can switch between the various SMMC models in seconds (like inserting the least expensive when you want to teach your kids to spin vinyl), or remove it entirely for visits of the Dreaded Cantilever-Snapping Cleaning Person.

Because the SMMC1 is relatively lightweight, has a high compliance, a lower output than most MM cartridges, and requires a low tracking force, it straddles a number of analog fences, both electrical and mechanical. The MMC series was originally designed for B&O's low-mass tonearms. With the trend in recent years toward low-compliance, heavy-tracking cartridges and matching tonearms of medium to high mass, I was concerned about the SMMC1's compatibility with the Graham Phantom and other medium-mass arms, and with the 40dB gain typical of most MM phono preamps.

The SMMC1's low output definitely means you'll be setting the volume somewhat higher than you may be accustomed to for an MM cartridge with a typical 4.5mV output. This didn't turn out to be a problem with the SMMC1 and the variety of quiet phono preamps I tried, which included Whest Audio's whestTWO (currently under review), the [Graham Slee Era Gold V](#), and the excellent if underappreciated Camelot Technology Lancelot Pro. However, if your phono preamp is noisy, consider that before choosing the SMMC1 or any MMC cartridge.

The [Graham Phantom](#) tonearm's 11–12gm of effective mass, plus the SMMC1's approximately 6.8gm, added up to about 17gm. For that effective mass and a compliance of 28µm/mN, Wally Malewicz's graph of tonearm resonances (see "Analog Corner," October 2007, p.31) suggests a resonant frequency of about 7Hz, which is just below the margin of acceptability (8–12Hz). The *Hi-Fi News Test Record*'s excellent tracks of vertical and horizontal resonant frequency confirmed that number. This suggests that if your arm's

effective mass is above 11–12gm, and especially if it doesn't offer damping, the SMMC1 might not be a good match.



That said, although 7Hz is not ideal, the SMMC1 performed extremely well in the Phantom, in part because of that arm's excellent silicone-fluid damping system. While some users don't use damping fluid with their Phantoms, I recommend it for a lightweight, high-compliance cartridge such as the SMMC1.

I also found SoundSmith's recommended capacitive loading of 400pF or greater to be accurate. In fact, I preferred the SMMC1's high-frequency balance with 350pF *added* to the Hovland MusicGroove2 cable's capacitance of 261pF/m (for a total of 611pF). While these settings will be, to some degree, a personal preference as well as system-dependent, be sure to at least know what your phono preamp's default capacitive-loading setting is—or, if it's adjustable, what your options are.

SoundSmith's channel-separation spec of >25dB at 1kHz proved extremely conservative. I measured 36dB—possibly the greatest channel separation I've measured for *any* cartridge. However, the stated channel balance of <1.6dB proved accurate (I measured and got the same figure)—at least with the sample *I built*—and in my opinion, that's at the margin of acceptability. I heard no channel imbalance, however, which is a good thing—my preamp has no balance control!

I gave the SMMC1 sufficient break-in time (at least 40 hours) at the recommended 1gm of

downforce, during which time it provided nothing but thorough musical pleasure and frequent amazement. Then the serious listening commenced.

## Sound

The SMMC1 effortlessly produced music from "black" backdrops. It produced big, vibrant, well-formed images on a luxuriously wide if not particularly deep soundstage. The incisive immediacy reminded me of the best of what was great about hi-fi's "good old days," and why some audiophiles still swear by "old school" MM cartridges from Empire, Pickering, and the like. In short, it was about as clean and articulate a tracker as you're likely to experience for any price—the kind of cartridge that made me forget about audiophile performance checklists and just kick back and listen for pure musical enjoyment.

You won't mistake the SMMC1's retrieval of detail, or its less-than-first-class reproduction of microdynamic gradations, for those of a premium-priced modern MC—nor did it reveal the most delicate inner musical textures, as those top-shelf transducers do. But it more than compensated with a refreshingly robust and musically convincing sound free of obvious colorations or artifacts. Its rejection of surface noise and other playback detritus was among the best I've heard at any price—and without lopping off the top-end extension.

The SMMC1's frequency balance was subjectively ultrasmooth, flat, and free of low-end bumps or high-frequency peaks. In that regard it bettered most of the competitively priced high-output MCs I've heard. Like the better moving-iron Grados, the SMMC1's most alluring qualities were its silky, coherent midband presentation and its freedom from transients that sounded edgy, sharp, or in any way unnatural.





However, unlike the Grados, which to my ears and in my system produce transients that are too soft and polite, the SMMC1 struck an almost ideal balance of transient speed and natural instrumental suppleness. Well-recorded female voices sounded particularly natural and vibrant, never hard, shrill, or etched. Transients were bold without becoming overbearing, and yet were also texturally nuanced and agile without inducing boredom or a desire for greater sharpness and definition.

Comparing three different pressings of Nick Drake's *Pink Moon* demonstrated the SMMC1's ability to point out the subtle but important tonal and spatial differences among them. This is such a good recording that ruining it would be difficult, but the Simply Vinyl LP, with its flattened, forward perspective that emphasizes string detail to the detriment of the guitar's woody overtones, and which misses *all* of the spatial and tonal subtleties, *must* have been sourced from a digital tape. (But who knows? Simply Vinyl simply refuses to reveal sources.) The UMG Japan reissue, with its superior image and spatial definition and subtle decay characteristics, sounds as if mastered from an analog source. The UK Island second pressing (orange and blue label) offers a somewhat more distant, less intimate, yet more detailed and eerily believable sound.

Thanks in part to the SMMC1's strikingly effortless midband, all three were free of mechanical artifacts, and infused with an evocative clarity and transparency by the cartridge's believable transient performance and black backdrops. Have you ever picked up an acoustic guitar? When you listen to the SMMC1's presentation of a good recording of the instrument, you'll recognize it.

The SMMC1's low-frequency presentation was equally well balanced, satisfying, and free of rubbery overhang and/or midbass bloat posing as low-bass extension. Bass transients were reproduced with great authority, though the SMMC1 couldn't produce the supple textural and tonal subtleties that produce the sensation of reality.

I pulled out some long-forgotten treasures for this review, such as Lew Tabackin's *Trackin'* (RCA Japan RDC-3), a direct-to-disc 45rpm set recorded in 1977 by Lee Hershberg at Warner Bros. studios. Through the SMMC1, Shelly Manne's drums, upfront and center, had great snap, crackle, and shimmer, while Tabackin's tenor sax, in the right channel, sounded all the right reedy elements. Toshiko Akiyoshi's piano was also upfront, rich with woody transient impact, yet not harmonically truncated. The entire presentation sounded vibrant and "live."

Switching to the Ortofon Winfeld, a cartridge costing almost five times as much—part of a

system costing far more than anyone contemplating buying a \$750 cartridge is likely to own—revealed what the SMMC1 couldn't do. The far more costly cartridge revealed the recording context of *Trackin'*, with subtle spatial cues that described the isolated space in which the drum kit had been placed. Heretofore masked microdynamic shifts in Manne's drumming produced the sensation of a living, breathing musician sitting there making instantaneous decisions about how hard to hit his cymbals and skins. The skins were better textured, and the cymbals produced greater depth behind the initial transient, with more ring and better decay. Tabackin's tenor was more fleshed out and rounded than it had been before.

But, to the SMMC1's credit, and *without* comparing it to a far more expensive cartridge, it produced a satisfying performance, with an overall sound that was smooth yet bold, rhythmically nimble, and free of edge and etch without being limp or soft. Listening to it for hours at a time, I never missed what I knew wasn't there, even though I could get it at the flick of a few buttons and by cuing up the [Continuum Audio Labs Cobra](#) arm on the other side of the CAL Caliburn turntable—what was there was so damn satisfying. Even if it missed some of the more subtle aspects of sound, the SMMC1 produced *music*.

## **Conclusion**

Just because you're spending \$750 instead of \$3000 or more on a cartridge doesn't mean it deserves less attention in setup. In fact, the Soundsmith SMMC1 demanded *lots* of attention before it sounded its best. This was especially true of its capacitive loading—if you don't pay attention to that, you may find the SMMC1's leading-edge transient performance not etchy and/or bright, but simply too pronounced, creating a skeletal performance that leaves the musical sustain and decay too far in the backdrop. But get those picofarads correct and the tonal picture will lock into place.

Also, be sure that the SMMC1's high compliance is compatible with your tonearm. Peter Ledermann told me that he's making the more expensive The Voice with two different compliances, to better match it to a wider variety of tonearms. [*The SMMC1 will also be offered in two versions, with high or medium compliance.—Ed.*]

Otherwise, track the SMMC1 at 1gm or a bit more, pay attention to antiskating, and, if your tonearm is up to it, you'll have smooth sailing no matter what's in the groove or how heavily it's been modulated. You'll also experience a big, vibrant, dramatic, well-focused, well-organized sound that will never let you down, regardless of your musical tastes.

Right now I'm playing Classic Records' reissue of Ella Fitzgerald's *Clap Hands, Here*

*Comes Charlie!* (Verve V6-4053), which some, at the time of its release, complained sounded hard, strident, even brittle. I hadn't played it in years. Today, after being demagnetized, it sounds big, spacious, detailed, and—especially on Lou Levy's piano—harmonically full and well organized. Herb Ellis's distinctive hollow-bodied electric guitar, which can be swallowed up in the piano's richer passages, is being separated out with unforced clarity, even when Levy and Ellis comp on the same notes. Most important, Miss Ella's sparkling presence is *right here*, sweet and free of grain, her sibilants cleanly rendered and utterly nonmechanical.

Although I'm sure *some* of its components come from overseas, the Soundsmith SMMC1 is made right here in the USA—when you buy one, you're not paying for its importation and a devalued dollar. The cartridge is a bargain at \$750. It would be a good value at \$1000. It's that good.