



Kuzma 4Point tonearm

By Michael Fremer • Posted: Sep 9, 2011



No one has ever accused Franc Kuzma of designing glamorous audio jewelry. His turntables and tonearms are industrial-strength examples of engineering know-how and machining excellence. But to those who appreciate such things, his products are truly beautiful, even if they're not adorned with chrome, wood, and sleekly polished surfaces. And if looking at the 4Point tonearm (\$6500) in pebbly Darth Vader black doesn't get your analog juices flowing, perhaps its innovative design will. But first, this message:

Whatever the design of a tonearm, there will be practical problems. The problem with gimbaled (fixed) bearings is obvious: the perfect gimbaled bearing would have zero chatter. However, even the best gimbaled bearing has some chatter, and chatter has an enormous impact on a tonearm's sound quality. On a visit some years ago to the tonearm-building facility of Rega Research, I watched assemblers randomly select bearings from a bin and test their tolerances. Though all bearings were from the same manufacturing batch, their quality varied widely. The best went into Rega's top tonearms; the rest were sorted by tolerance for use in lower-priced arms. Change nothing but the bearing and you significantly change the sound.

Though a unipivot bearing is not fixed, unipivots can produce their own form of chatter when insufficient mass is brought to bear on the point/cup interface, or when the quality of the parts isn't high enough. Unipivots can also have problems with stability, and with the arm moving in directions other than the desired vertical and horizontal axes.

Graham Engineering, for instance, uses an ingenious magnetic stabilizer system that rotates on a high-quality horizontal bearing (which will have a degree of chatter) to prevent unwanted movement, and to create a unipivot that is like a gimbaled bearing. Other makers of unipivot arms have their own fixes, including stabilizing outriggers similar to those used by high-wire artists. Continuum Audio Labs' Cobra and Copperhead arms employ a secondary vertical pivot riding on a sapphire "swash" ring affixed to an ABEC7 bearing—which, of course, will have a degree of chatter. This sort of bearing design provides both stability and a means by which the cartridge's azimuth angle can easily be adjusted.

Then there are the so-called tangential-tracking tonearms. The best of these use an arm and headshell mounted on captured-air bearings that move smoothly along a fixed cylindrical rail. A less satisfactory method fixes the air bearing and moves the more massive rail. Others force air through tiny holes in the rail, over which slide passive cylinders buoyed by the pressurized air captured within. In another design, a tiny, trolley-wheeled device slides along quartz rails. In still others, the arm moves, its tangency to the groove maintained by a motorized servo-mechanism.



All of these designs look cool and appear to be linear trackers—*ie*, they maintain a constant tangency to the groove—but few are. Most actually crab their way across the record surface in a series of microscopic arcs that produce more and repeated tracking error than do well-designed and set-up pivoted arms.

Again, unless the bearing is so tight it won't move, the spacing necessary to permit movement in such arms produces fore-and-aft or up-and-down motion, or yaw, along the cantilever's zenith angle—all at microscopic levels invisible to the naked eye.

Tangential-tracking arms have differing horizontal and vertical effective masses, which results in mechanical and thus sonic problems, as does the need to move the tonearm wires across the record surface along with the arm.

In my experience of air-bearing arms, only those that have captured bearings that maintain a uniform pressure around the air gap can *truly* be called air bearings, and because only they can maintain true tangency to the groove. The others are hovercrafts of one sort or another. Some hovercraft arms can work pretty well and sound good, but I'm not convinced they can maintain true tangency.

Even pressurized air bearings that do maintain tangency have another serious problem: The air has to go from high pressure to the ambient room pressure within a matter of inches, as the pressurized air reaches the annular gaps at the end of the bearing. If you want to imagine what that's like, blow up a balloon and let it go. Consider the balloon's behavior, and imagine what's happening at the gap as the bearing moves across the record surface: the air struggles violently to escape and reach ambient room pressure. To the best of my knowledge, the only captured-air-bearing arm that compensated for this problem was the one on the discontinued System III Sirius turntable, from Andy Payor's Rockport Technologies, and it did so only at great expense.

The Point of the 4Point

Franc Kuzma builds very fine tonearms with all kinds of bearings—fixed-gimbal, unipivot, captured-air—each an accomplished variation on a well-established technology. But in the new 4Point he's come up with something unique: a tonearm that combines the advantages of fixed gimbals and unipivots while appearing to avoid the shortcomings of both.

Imagine a unipivot bearing: a polished point sitting in a cup. In VPI's JMW Memorial tonearm, the cup is in the arm's pivot housing; the point is part of the arm base. In Graham Engineering's Phantom arm, these positions are inverted. Kuzma's ingenious design for the 4Point features a shelved horizontal bearing sleeve (a vertical post) that rotates in a unipivot-like cup, and a polished point that permits lateral movement of the arm. The arm doesn't tip over, though: enclosed in and attached to the bearing sleeve is a second point, at 90° to the first, that contacts a polished surface on an internal post—this is the actual bearing.

In this arrangement, the external sleeve is kept from moving in any unwanted direction, which is critical: two additional cups are affixed to the aforementioned sleeve "shelf," which is attached to the horizontal bearing sleeve. Two precisely angled points attached to the lower surface of the removable tonearm assembly engage the angled cups affixed to the shelf, providing the arm's vertical motion.

Thus you have four points contacting four cups (three circular, one elongated) that permit the arm to move in both the vertical and lateral planes, minus the chatter of gimbaled bearings and the instability of unipivots. Brilliant!

The Rest of the Design

The bearing system described above is offset from the tower assembly for adjusting vertical tracking angle (VTA), with its locking vernier dial, all superbly engineered and machined. This is an adaptation of the one in Kuzma's Airline arm. This arrangement has a precedent in Herb Papier's Tri-Planar arm (formerly the Wheaton Tri-Planar) of the 1980s, which also had a VTA adjustment tower and offset bearing. A benefit of this system is that it permits rotation of the bearing around the tower. Thus, the 4Point's 11"-long arm could be accommodated by the mounting platform that Continuum Audio Labs designed and built, to allow me to use the 9"-long Graham Phantom on the Caliburn 'table's second arm mount.

The 4Point's tapered, two-piece aluminum armtube is borrowed from earlier pivoted Kuzma arms. Azimuth can be precisely and easily adjusted by loosening two screws, inserting an Allen key in a hole, and turning it. Lines on either side of the tube allow you easily to return to an angle of 0°.



Also borrowed from the Airline is the 4Point's rigid, angled-construction headshell—but this one is removable, thanks to a short, beefy, hexagonal protrusion that fits securely into a matching opening on the arm and locks tightly with a grub screw atop the arm. A tiny threaded hole lets you screw in the finger lift, if you want it.

Try this system and you won't lose a minute's sleep worrying about a loss of rigidity or azimuth stability, or about adding an electrical break: the cartridge wires and clips protrude from an opening just behind the connector. This arrangement makes swapping out cartridges fast and relatively inexpensive, given that you only need extra headshells rather than armtubes (Graham) or entire tonearms (VPI). The cartridge overhang is preset. All you have to do is reset the previously established vertical tracking force (VTF), antiskating, azimuth, and VTA, all of which this design makes relatively easy.

Two wires attach to each cartridge clip. At the other end of the arm are two termination points: one is a pair of Eichmann RCA Bullet plugs at the end of a 1.4m-long cable of high-quality silver wire, the other a box with a pair of Cardas RCA jacks. Thus you can choose to run direct out, or via your favorite phono cable, or both (to parallel the value of the desired load when connecting to two inputs of the same phono preamp).

The counterweight system is as ingenious as everything else about the 4Point. It has two threaded shafts: the larger of which is below the vertical pivot point, and is used to establish the arm's basic balance with an assortment of weights and damping washers; the smaller, upper shaft is used to set the actual VTF. This way, most of the counterweight's mass can be just where you want it: close to the pivot point.

Antiskating is set via a familiar mechanism of thread, cam, and weight, attached to the platform that holds the armrest and the cuing mechanism, itself attached to the bearing platform. The 4Point's effective length of 11" means that it needs less antiskating force than would a shorter arm.

Kuzma has also provided for separate, easily adjustable vertical and horizontal damping, using the familiar system of a paddle in a trough filled with silicone fluid.

Other pertinent stats include a pivot-to-spindle distance of 264mm, a spindle-to-VTA-platform center

distance of 212mm, and, most important, an effective arm mass of 13gm.

Setup and Use

Thanks to excellent instructions, photos, supplied tools and accessories, installing the 4Point was relatively easy. On the Continuum Caliburn turntable, however, I couldn't meet Kuzma's specified pivot-to-spindle and spindle-to-base distances; a workaround was required to achieve proper cartridge alignment. I won't go into the details here. However, the 4Point uses a 40mm post-and-collar mount. Kuzma can supply collars compatible with virtually any mounting system, assuming your 'table can accommodate the post's depth and the tonearm's weight (over 3.5 lbs).

Otherwise, setup was straightforward for all parameters. Equally important was the ease with which I could swap out headshells. The feel of the 4Point was superb: It had the stability of the best fixed-gimbaled arms, and felt virtually frictionless. Lift the cuing arm, then lower it, and the stylus returns to the groove it just left. Lower the stylus into the lead-in groove, and it never stumbles, slides, or jumps into the first track.

Love at First Sight

A few years ago, when I first saw the 4Point, it was love at first sight—this tonearm's physical appearance just about screams *stability* and *certainty*. And, it turned out, so did the sound it didn't produce.

I set up a 4Point in Stockholm last winter, when I gave seminars in turntable setup at an audio show there, but I never got to hear it. Now that I've installed it on the Continuum Caliburn, I realize how unfair I was to the [Brinkmann 9.6](#) tonearm (\$3990) I reviewed in the May issue. Of course, the Brinkmann wasn't as good as the 4Point. I'm not sure *anything* is, even the Continuum Cobra. . .

I also realized how fortuitous it was for Dr. Christian Feickert that I used the 4Point with his Blackbird turntable, reviewed in this month's "Analog Corner." No wonder, when I told Feickert that I planned to pair the products for that review, that his reaction was something like "Oh boy!"

Rather than remove the Ortofon A90 cartridge from the Cobra, I decided to return the Lyra Titan *i* to service after a lengthy break. I had high expectations, because I know the Lyra's sound so well.

Those expectations were exceeded. The 4Point had an immediacy, a transparency, and an evenhandedness of frequency response that surpassed those of any other tonearm I've heard, *possibly* including the Cobra—though I've not yet swapped out the A90 for the Titan *i*. Why haven't I? Because what I was hearing from the Kuzma-Lyra combo was just too good to lose. It would have to wait until tomorrow . . . and then the next day . . . and then I was past deadline.

The 4Point revealed all of the Lyra Titan *i*'s best qualities—dynamics, transparency, resolution of detail—with unsurpassed intensity, while my one reservation about this cartridge, an apparently tipped-up top end, was nowhere to be heard. I'd never heard the Titan *i* sound so tonally well balanced.

Late one warm evening came my first playing with the 4Point of Brian Eno's classic *Another Green World*. How many plays have my original UK and Japanese pressings had since their release in late 1975? I can't count, but I enjoy the album as much now as I did then—though it sounded much better now! Through the 4Point, Percy Jones's fretless bass achieved a tactile stickiness that was both delicate and depth-charged as needed, which is what's called for, but I'd never heard it reproduced so cleanly and convincingly.

It was easy enough to switch to the Cobra-A90 combo; I went back and forth many times, and the two tonearm-cartridge pairings produced completely different results. The Cobra-A90 sounded more polite and perhaps more nuanced and delicate than the Kuzma-Lyra, but far less immediate and transparent—as if a scrim had appeared between me and the music. The Kuzma-Lyra sounded more like tape, less like vinyl—or at least that's what I kept telling myself.

I had another cartridge mounted in the second headshell supplied with the Kuzma: the Miyajima Labs Kansui, which, to put it as simply as possible, is a higher-compliance, higher-resolution Miyajima Shilabe. Swapping out cartridges produced a totally different sound, as you'd expect from a change of transducers, but again—the immediacy and transparency of the 4Point were transferred to the Kansui, so that the cartridge's character shone through unimpeded by the arm.

Running through a series of test pressings of familiar music from Quality Record Pressings produced equally exalted results, particularly in terms of low-level resolution and fade-to-black quiet (wait'll you hear Analogue Productions' 45rpm edition of *Getz/Gilberto*, transferred from the original three-track master!). As familiar tracks faded out, there seemed to be more music before the final silence.

Swapping between the Cobra (no slouch!) and the 4Point confirmed the Kuzma's ability to stabilize solid, three-dimensional images and sail cleanly through difficult passages of vocal sibilants across the entire record surface.

Perhaps the music—covers of "People," "Days of Wine and Roses," and other '60s pop—on the Oscar Peterson Trio's *We Get Requests* isn't the greatest, but the recording is. The 45rpm test pressing (two 200gm LPs, Verve/Analogue Productions AVRJ 8606-45) demonstrated the 4Point-Titan i's ability to reproduce Peterson's piano with a timbral, textural, and image solidity, plus transparency, that the Cobra-A90 did not. The latter's version was very, very good, but individual notes didn't have the same level of purity and cohesiveness. Keystroke after keystroke, the Kuzma-Lyra produced a physical certainty and solidity that the Cobra-A90 seemingly didn't.

I'd been repeatedly playing "Teeter Totter," from Joe Henderson's *Our Thing* (45rpm, Blue Note/Music Matters MMBST-84152), and though it's a good Rudy Van Gelder recording, Andrew Hill's piano has the characteristic Rudy piano mud. The 4Point cut through and cleared up a remarkable amount of that muck, to reveal a gleaming keyboard sound. The Cobra-A90 was good, but not as coherent or immediate or three-dimensional.

Until I'd made these comparisons, I didn't think it could get any better than the Cobra. Now I'm not sure. From bottom-end clarity and weight to image solidity and three-dimensionality to seemingly neutral tonal balance and remarkable transparency, the Kuzma 4Point surpassed the Cobra's excellence in all of these parameters. What accounts for the difference? The damping the Cobra lacks may be part of it, but I think it's more a result of the 4Point's stability coupled with the tightness of its chatter-free bearing.

I plan to use my [Alesis Masterlink](#) hard-disk recorder to make 24-bit/96kHz recordings of the Kuzma 4Point and Lyra Titan *i*, with and without damping, as well as of the Continuum Cobra and Ortofon A90, then swap out cartridges and repeat. Stay tuned.

In the meantime, I think the Kuzma 4Point is a better tonearm than the tangential-tracking Kuzma Airline that I [reviewed in April 2007](#). I value the 4Point's tonal correctness more than I do whatever audible (or, in my book, mostly inaudible) tracking-error distortions are caused by pivoted playback, and I think the 4Point avoids a brightness I couldn't tame in the Airline, and that listeners at a Consumer Electronics Show picked out immediately when, in various exhibit rooms, I played CD-Rs I'd recorded from it. Was that brightness caused by an oscillation at the annular gap and the high-pressure air returning to ambient room pressure? I have no idea.

Conclusions

As I wrote at the beginning, the quality of a tonearm's bearing has a profound impact on its sound, and I'm not sure there's a better bearing system than what Franc Kuzma has designed for the 4Point. He's come up with new and ingenious uses of well-known technologies, the up- and downsides of which are well known, and which he's seemingly avoided.

What I do know is that while I'm hesitant to call anything "the best," unless the cartridge swap described above changes things, I can definitely say that the Kuzma 4Point produced the best performance from the Lyra Titan *i* that I've ever heard from it in my system: the best tracking, the best tonal balance, the best imaging, the best (and most remarkable) cleanness of vocal sibilants. The Lyra's bass performance was as deep, fast, and nimble as I've ever heard it, and its image solidity and soundstaging in general were also the best I've heard from this cartridge.

The sound the 4Point produced had an immediacy, continuity, transparency, linearity, and freedom from mechanical artifice that, until now, I'd thought could be heard only from open-reel tape. Oh, I might have said that before, and others surely have—but this time, dammit, I mean it!

Add to that mechanical robustness, ease of cartridge swapping and setup, and an effective mass that should allow it to be used even with a high-compliance cartridge such as Shure's V15VxMR (though the Shure's resonant frequencies will be on the margin of acceptability), and you have one incredible tonearm. I'm in love.

I reviewed Kuzma's 4Point tonearm in September (p.99) and concluded "while I'm hesitant to call anything 'the best'. . . I can definitely say that the Kuzma 4Point produced the best performance from the Lyra Titan *i* that I've ever heard from it in my system: the best tracking, the best tonal balance, the best imaging, the best (and most remarkable) cleanness of vocal sibilants." However, when I compared the \$6500 Kuzma with my long-term reference tonearm, the [Continuum Audio Labs Cobra](#) (\$16,995), the latter was fitted with the Ortofon A90 cartridge. I preferred the Kuzma/Lyra to the Continuum/Ortofon, but further comparisons were necessary to eliminate the effect of the different cartridges.

Using my BPT-modified [Alesis Masterlink](#) hard-disk recorder, I played and recorded some LP test tracks at 24-bit/96kHz, first with the Lyra Titan *i* cartridge in Kuzma's 4Point tonearm, and then with an Ortofon A90 cartridge in Continuum's Cobra arm. Both arms were mounted on the Continuum Audio Labs Caliburn turntable. Then I swapped the cartridges between the arms, played and recorded the same tracks again, and compared all four versions.

These are both great tonearms with similar tonal balances, but I think the Kuzma 4Point pushed more energy down the pipeline. It sounded closer to the sound of tape than any other arm I've heard. An improved version of Graham Engineering's Phantom is on the way, but for now, the Kuzma 4Point may be the finest tonearm out there, period.—**Michael Fremer**

Sidebar 1: Associated Equipment

Analog Sources: [Continuum Audio Labs Caliburn, Cobra, & Castellon](#) turntable, tonearm, & stand; [Graham Engineering Phantom II](#) tonearm; Ortofon A90, Lyra Titan *i*, Miyajima Labs Kansui cartridges.

Digital Sources: [Playback Designs MPS-5](#) SACD/CD player–DAC, BPT-modified [Alesis Masterlink](#) hard-disk recorder, [Sooloos](#) music server, [Pure Music](#) software.

Preamplification: [darTZeel NHB-18NS](#), [Ypsilon PST-100](#) preamplifiers; Ypsilon VPS-100 phono preamplifier.

Power Amplifier: [Soulution 710](#).

Loudspeakers: [Wilson Audio Specialties MAXX 3](#).

Cables: Phono: Hovland/Graham Engineering MG2 Music Groove. Interconnect: [TARA Labs Zero](#), Stealth Sakra, ZenSati. Speaker: TARA Labs Omega Gold, ZenSati. AC: TARA Labs The One Cobalt, Shunyata Research King Cobra Helix CX, Isoclean 1000.

Accessories: Shunyata Research Triton power conditioner; Oyaide AC wall box & receptacles; [Finite Elemente Pagode](#), HRS SXR stands; Symposium Rollerblocks; Audiodharma Cable Cooker; [ASC Tube Traps](#), RPG BAD & Abffusor panels; Furutech DeMag & deStat LP treatments; VPI HW-17F, Loricraft PRC4 Deluxe record-cleaning machines.—**Michael Fremer**

Sidebar 2: Specifications

Description: Pivoted tonearm with four-point bearing system.

Dimensions: Effective length: 11" (280mm). Pivot to spindle: 10.3" (264mm). Overhang: 0.6" (16mm).
Total weight: 3.63 lbs (1.65kg). Effective mass: 0.4oz (13gm).

Serial Number Of Unit Reviewed: 091.

Price: \$6500. Approximate number of dealers: 10.

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