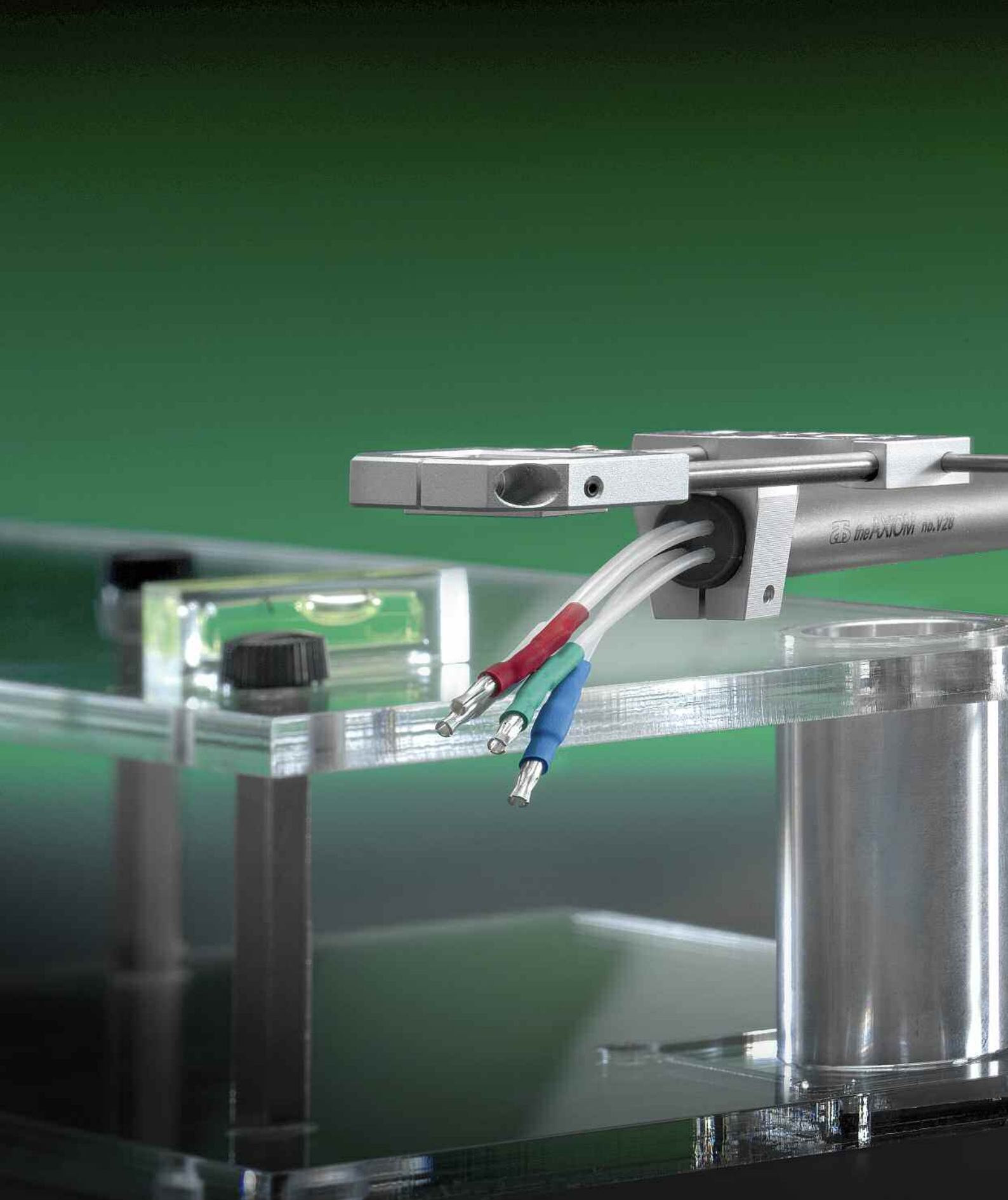
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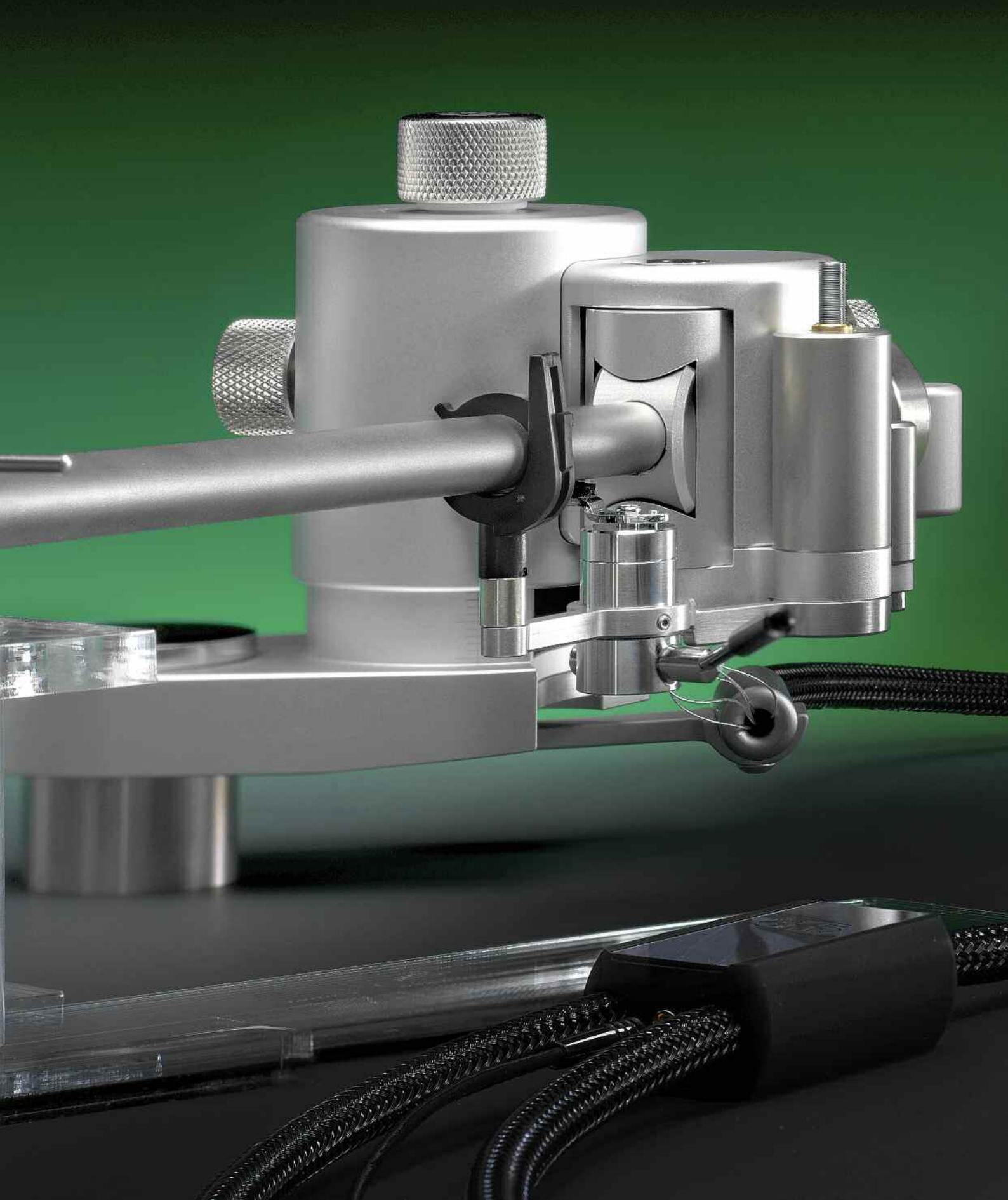


Beyond all doubt

The high precision technology and production quality of the Axiom tonearm commands the highest respect from not just our photographer, Rolf Winter – and he has seen it all. Underneath an impressive exterior are sonically beneficial technical solutions which you will not find in any other arm.

It is a common misconception that, in principle, the development of technology functions exactly like Darwin's Theory of Evolution, i.e. that which functions better and is better adapted to the challenges of its environment will survive. In fact, over and over in the history of technology, influential and financially strong companies have ensured that third-party patents and better products never see the light of day, in favor of more profitable ones. However, the focus of this discussion is not the decades-old invention of the indestructible nylon stockings or light bulb (and certainly not the alliance between petroleum companies, car manufacturers and government revenue via gas taxes); but rather on brilliant inventions such as the eco-friendly Flettner rotor that fell victim to cheap ship diesel in the early 1930s. There are also inventions which were simply forgotten. Historically famous examples include how man forgot all about scripture in the Aegean Sea region, after the collapse of the Mycenaean culture in the first millennium BC.

And the invention of the steam engine by Heron of Alexandria in the first century AD. Records show that the Romans were fascinated with how Heron was able to open heavy doors using rope winches and a steam pressure design. But ultimately they had no use for this elaborate technology, since there was plenty of cheap labor available.

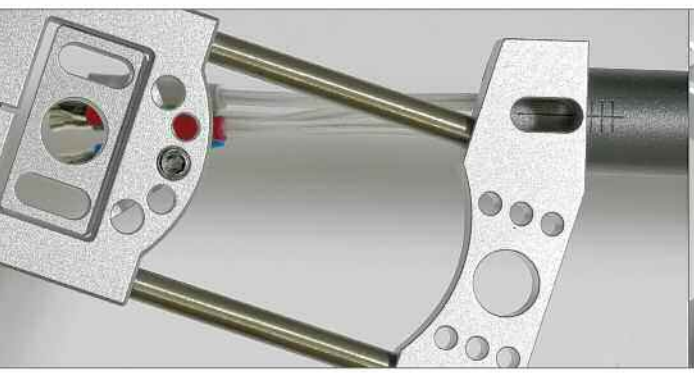
I'm sure there are quite a few technophiles among our readers who could add to the list of remarkable inventions that ended up being unjustly forgotten. But can you think of an example from the history of HiFi? I'll tell you of one, and I can imagine quite a few readers will be scratching their heads: Lateral balance in ball bearing and knife-edge mounted pivoted tonearms. Of course – many of us are familiar with them, having set them up in the course of our Hi-Fi lives already, perhaps on a Yamaha deck, a Micro Seiki, possibly with a Lustre arm, and, of course, SME tone-arms. You remember? On many SME models you were able to move the counterweight unit laterally (relative to the main counterweight) using a threaded outrigger, preferably toward the platter axis. And why? Because to the right of the imaginary line between the pivot and needle tip the mass is greater than to the left of it (of course, the head shell features an offset angle, and thus the mass loses its balance). This results in a

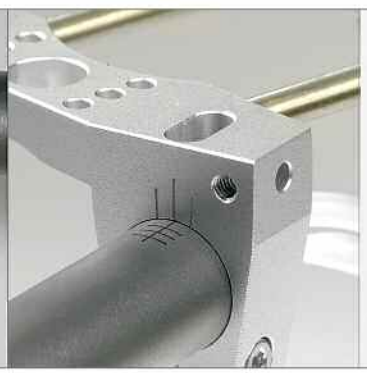
tilting moment which not only loads the tone arm bearings unequally, but most importantly the resulting force vector – oops, sorry, I know that horrifying school vocabulary such as „vector“ makes one want to skip a few lines ahead, but I'm almost done – increases the pressure of the needle on the inner flank of the groove.

Without countermeasure this pressure adds to the skating force. A force we really want to keep absolutely as low as possible in order to prevent skating and anti-skating forces from constantly tugging at the needle, beyond what is strictly necessary. Such forces are already constantly changing due to the varying geometric conditions when playing a record with tonearms featuring an offset angled headshell, and anti-skating devices do a very rough job of balancing them out. In short: Skating is far more evil than the harmless word „vector“: it is not something that you can skip over like certain lines you read;

Associated Equipment

Turntables: TW-Acustic Raven Black Night, Brinkmann LaGrange 2-arm / RöNt 2, TechDAS Air Force One, Nottingham Deco **Tonearms:** ViV Rigid Float, TW-Acustic 10.5, Nottingham Anna II, Brinkmann 12.1, Graham Phantom Elite **Cartridges:** Fuuga, Kondo IO-M, Ortofon A95, Cadenza Mono, Soundsmith Strain Gauge, Air Tight PC-1 Supreme, Brinkmann EMT ti, London Reference **Phono step-up transformer:** Kondo KSL-SF-Z, Ortofon ST-80 **Phono stages:** Kondo KSLM7, Gryphon Orestes **CD transport:** Jadis JD1 Pro MkII **D/A converter:** Jadis JS1 MkIV **Tuner:** Marantz 10B **Preamplifier:** Kondo KSL M77 **Power amplifiers:** Jadis JA 80 (2010), Signature Century Origin, Gryphon Reference One **Loudspeakers:** YG Hailey, Cessaro Wagner, Living Voice OBX-RW, DeVore O/96 **Cables:** Silent Wire Imperial, Kondo KSL-LPz, KSL-SPz2, KSL-ACz Signature/-Furutech E50(R), Aural Symphonics Magic Gem v2t **Accessories:** Hensler Cablewave NL-7 + NP-1000, powerbar Magnan Signature, Silent Wire, Acoustic System Resonators, Shakti Hallograph, Harmonix RFA-78i, RF-999 MT, TU-220 MT, TU-210 ZX, MY-TU-201, Tuning Spike Base RF-900, Shakti Stones. Shelves: Thixar SMD, HRS, TimeTable, Audio Magic Delta, Black Forest SoundBoards + SoundBridges, Shun Mook Valve Resonators, Mpingo Discs, L'Art du Son CD cleaner + record cleaning fluid, Audiophil Schumann Generator

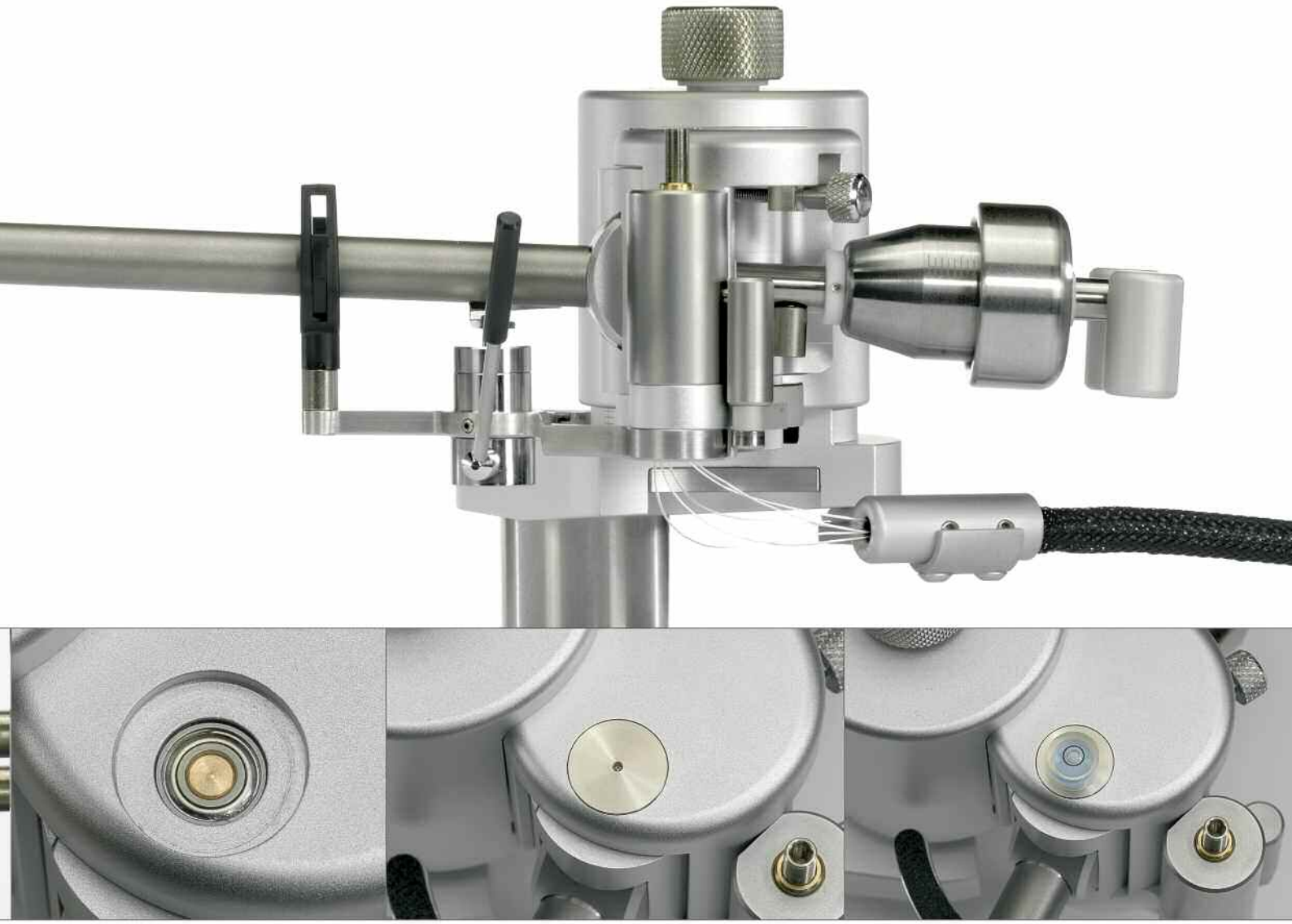




Perfect headshell: The overhang and the needle azimuth (for vertical positioning of the needle into the groove) on the arm wand clamp are scaled to allow for fine adjustment

The highlight: The cartridge mount level can be precisely tilted with an Allen screw. Thus, the vertical tracking angle (VTA/SRA) of the stylus can be directly set at the cartridge. This allows for the tonearm wand to always be parallel to the LP surface. As a result, important geometrical parameters are preserved

Tip: Any adjustments made to the VTA can be precisely reproduced with use of a long Allen key



Above: It doesn't get better than this: The tonearm cable is made up of seasoned 5N pure silver wire, which itself consists of 36 individual Litz wires with a diameter of 3/100 mm constructed around a non-conductive core. The cable shows no restoring force thanks to the extremely thin single wires; it neither interferes with the rotary process, nor does it affect the skating forces. A cable such as this is almost unobtainable on the world market today

Below: The tiny bubble level is used to ensure that the arm base is mounted perfectly vertical


theAXIOM
by acoustical systems

it massively disturbs the tracking process of the cartridge, and you certainly don't need a force that further adds to this tug-of-war at the stylus. By the way, when using uni-pivot tone-arms lateral balance adjustment is obligatory because without balancing, the stylus would sit crooked in the groove. Admittedly these forces do not simply disappear on a conventional ball-bearing tonearm simply because the latter does not turn around its axis like a uni-pivot tonearm, because it is secured in the bearing. If you are having trouble imagining the effect of the forces that result due to the tilting moment when there is no lateral balance: Just think of an arm that has to make slight vertical movements in order to follow the groove (which any arm must, ever so slightly, even on non-warped discs). This illustrates how the tilting moment to the right can't be in any way productive to an undisturbed tracking process.

Why am I bothering you with all this at the beginning of my report on the Axiom tone-arm? Because I wish to praise the designer and manufacturer of the tonearm, Dietrich Brakemeier, for having devoted the necessary attention to this not entirely unimportant factor and giving the Axiom a counterweight for the lateral balance. Sure, this is just one of a whole bunch of measures for keeping the stylus as steady in the groove as possible. But it is one that used to be standard on upscale tone-arms in days gone by, but has now been almost completely forgotten, and is therefore a notable exception.

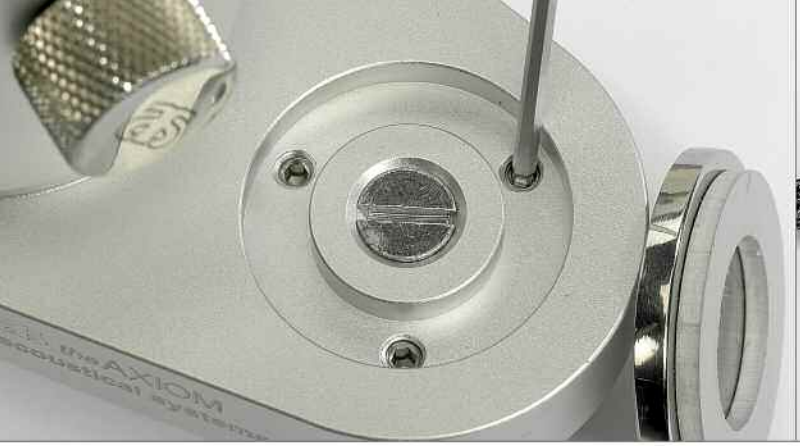
Before devoting ourselves to some of Brakemeiers other measures, we must ask: what good do they do? In the time I've had the Axiom I have listened to the folk Krautrock gem Saat by Emtidi (Pilz/pop import 2029077-8) with four different cartridges, although not ne-

Unique solution: The tracking force can be set not only by means of the scaled counterweight. The nano-fine thread with self-lubricating spindle made of beryllium bronze allows precise adjustment during playback via the magnetic tracking force adjustment. Function: The small magnetic cylinder in front of the counterweight interacts with its height-adjustable curved counterpart underneath

Above: Adjustment screw for non-contact anti-skating

Bottom left: Bearing block with nano instrument bearings

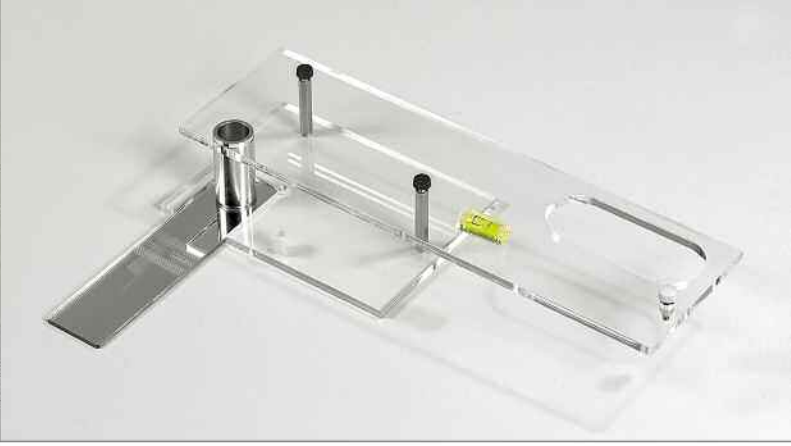
Bottom right: Surfaces in camera body finish (Leica) with anodized ceramic hardness



cessarily one after the other in a direct comparison: the Ortofon A95, the Lyra Etna, the Air Tight PC-1 Magnum Opus (a commercially unavailable intermediate version of the Supreme) and the Fuuga. „Walkin' in the Park" begins as a quiet, dreamy piece, but with the Axiom, Dolly Holmes' gentle voice rises with considerable force to a conquest of the entire room. Above all, it now has a crystal clear purity and strength, that immediately engrosses you completely, just as you would be by a great voice singing directly at you. This is exactly how this voice sounds in reality: you hear and feel it immediately, how melodious it is, that the radiant spectrum sounds exactly as it should and that everything that went before it was only more or less a snippet of it. All the while, it remains completely stable, never hardening. It's amazing how superior this sounds with the Axiom, regardless of the pickup used. Sure, an A95 is a bit more sober, some would perhaps say it has a slimmer, more neutral approach; the Fuuga, on the other hand, is more melodic and has more character, the Etna has more merciless dynamics and the Air Tight has lots of everything. However, ultimately, what we came to recognize is that the cartridge used wasn't the deciding factor. The deciding factor is the clarity, stability, strength and spatial definition that is without a doubt attributable to the tonearm.

With this next album I am pushing the requirements one step further: Christian Vander's Offering (JARO/EFA 4129/30, 2-LP set) is dedicated to John Coltrane and, appropriately, the thumping rhythms we are accustomed to from his band, Magma, are fused with more contemporary jazz and lyrical passages, while still staying true to the almost orchestral big band „overpowering sound". Consequently it is difficult to accurately play back the album in its many aspects – especially when Stella Vander joins in with her often penetrating voice. However, thanks to the Axiom she is anything but penetrating: now she simply sounds secure, full and firm. Piercing, yes, (and how wonderfully physical the Axiom makes this), but no trace of nervousness or strain. The voice maintains its spatial positioning, even if it spreads out in the recording room. And because now the origin of her plangent energy is preserved, she creates a central focus of power with her voice, so to speak, and can give even more (this is what is so live-sounding and gripping) and can sail through large instrumentation including brass, percussion, drums and everything else as if it were nothing. There must be something special happening here, the energy and most minute spatial information details must remain totally intact, otherwise it simply wouldn't succeed so extraordinarily well.

Part of the Axiom's law of conservation can be attributed to dynamic eruptions - initially they appear unexpectedly, i.e. on a small scale; the beat of a drum sounds more assertive than we are used to, and drives the music on with its hard, precise „Tockkk", creating an overall more organically harmonious effect. Thus, the typical Vander hypnotic groove develops on its own, drawing you in, without you needing to be in the mood right off the bat. This is because the recording of the louder passages is in no way restricted, but on the contrary can continually grow, which has an extremely involving effect on the spatial presence. In the upper registers, the overtones of, say, percussion and flute are unusually clear, stable, and confident, without having to sacrifice the tonal neutrality for their ex-



tended dynamic range and the fantastic definition in space, on the contrary: It comes across as so harmonious that it is difficult to describe in terms of timbre; there is no discernable anomaly, and therefore nothing to describe or compare. It simply sounds right and the experienced ear is then simply able to embrace recording mikes, mixing desks and other sound-influencing factors, rather than designating them as distractions. In this way the musically so cherished recording now sounds outstanding; the impression of an only slightly above-average recording of a very challenging setting for any recording- or reproduction system has given way to an excellent one. It was a revelation to me to hear how the rock-orchestral force and the sometimes wild vocals of Guy "Zu" Khalifa can grow ever louder, among other things, where the rest of the recording seemed restricted.

By and by I ought to say a little more about how Brakemeier draws such surprising and amazing results from his Axiom - forgive me for spending a little more time getting carried away writing about sound. His primary concern is to give the needle in the groove as close to undisturbed working conditions as possible. The first disturbances, as previously described, occur due to the fact that the needle is usually pulled back and forth in the groove by skating and anti-skating forces. He has already laid the foundations for markedly reducing the usual heavy skating forces across the surface of an LP with the UNI-DIN geometry that he himself developed (and which can be set up using his SMARTractor template). This geometry exhibits a particularly flat curve, which causes the skating forces to vary less than usual while running over the surface of the LP. In conjunction with a reduced headshell offset, which his UNI-DIN geometry makes possible, plus the lateral balance, he speaks of a theoretical 50% lower skating force than usual.

Additionally, his arm is equipped with a three-phase skating compensation, a dynamic anti-skating. Three magnets gently equalize the various skating forces depending on the geometrical position of the arm on the LP, thereby avoiding the otherwise inevitable, almost permanent over-compensation. In practical use, I was actually able to set a very low anti-skating force, allowing the cantilever to remain undisturbed and neither pull toward the inside nor the outside. In balanced state, I observed only a fraction of the typical skating drag at the selected setting; the arm gradually drifted outwards at an extremely leisurely pace. In practice, with a very precise adjustment, I'd say the usual anti-skating was reduced to approximately just 20% of the usual anti-skating force. I know of no other pivoted tonearm featuring an offset angled headshell that requires so little anti-skate; there is only the straight ViV Rigid Float, which has a slightly larger variance of the tangential while running over the surface of the LP, because of its 0° offset angled headshell. This results in minimal skating forces (albeit negligible in comparison to angled arms). Despite all the other differences between the two arms, the German and the Japanese developers do agree on another important constructive point – in the outer area of the LP, the tracking conditions for the stylus are so good, thanks to the higher tracking speed and reduced curvature of the groove in this regeion, that both find a somewhat higher geometric deviation in this area easy to tolerate. Even if the Rigid Float's deviation from the tangential is higher, the sonic result justifies either of the two.

Easy installation: An M5 hole or thread is all that's required to install the Axiom (far left). The three spiked grub screws allow for precise leveling of the tonearm

It goes without saying that a tonearm's bearings play an important role upon preserving miniscule signals and that they cannot allow for any slackness or even rattle inclination when stimulated. Here too, Brakemeier pushes the limits of what is technically feasible: he sources the four ball bearings in three different sizes - i.e. no two equal-sized bearings on an axis - from the German nano-instrument bearings specialists GRW. They are chosen for the lowest starting friction torque avoiding any delay when the pick-up arm follows the groove. This factor is of paramount importance, and one that is particularly difficult to achieve. Typically, the selection criterion of such bearings is related to their maximum rotational speed, which makes sense in all other applications, but not when it comes to tonearm bearings. Thus, the Axiom nano bearing should cost one hundred times what you would expect an improved arm bearing to cost. As if that were not enough: the bearings are sent out in order to be fitted in the bearing block in a temperature process. This is the only way to guarantee a force-free bearing seat without any tension. The total costs for the tonearm bearing are astronomical and bear no relation to anything else being achieved in the HiFi sector. But you should try letting the balanced tonearm swing back and forth once between your hands – I have never before experienced such ease of movement. Other high-quality arms pale in comparison, feeling more like agricultural machinery. The entire arm is manufactured more along the lines of a precision measuring instrument, which is unfortunately reflected in its price. In my opinion, however, it is a more appropriate price than what is being charged for other extremely high-priced tonearms, like the Vertere or the SAT; on closer inspection these figures and their comparative counter value appear to be shock prices, designed to grab attention and find favour with those buyers who want to have the most expensive equipment.

After a long time of listening with the Axiom (I had initially set it up on the TechDAS Airforce One, then the longest by far on the outstanding Raven Black Night, without which the dynamic capabilities of the tonearm would never have emerged with such clarity)

Secure connection: The Axiom can be equipped with any desired termination. We recommend the excellent standard solution with continuous pure silver cable direct to the phono stage input

I can finally conclude that there is no real competition in almost any sonic aspect. In some respects, it particularly stands out: when it comes to voice playback, pushing the limits of the dynamic spectrum, delineating all kinds of spaces whether it be especially close and intimate or enormously illuminating, rendering physical size of sound events, the stability of sound sculptures and particularly in the resolution of complex structured high frequency and overtone events; here, it seems to truly extract the most from the capabilities of analog record technology, and to achieve the quality of master tapes.

Allow me to refer to a few more recordings that illustrate the incredible qualities of the Axiom in an exemplary manner. I suspect many listeners are familiar with Esther (EMI/Columbia/Hörzu, SHZE 367) Esther Ofarim's first solo album, and many have heard how different the individual tracks sound. What I didn't know was how much the voice in „La Vezina Catina" rings forth from the room and how many very quiet mouth noises, such as lip licking and suchlike, are included: it virtually sounds like it's coming from a spatial bed. In „Ziunionei Haderach", Ofarim's voice comes right the way forward, like I've never heard before, and it is fantastic how the finest details and contours are preserved, even when the voice is melting the very air with its energy; the bass can still powerfully pluck away in the middle right, while the guitar and violin clearly remain in their own sound space. And on „Leil Galil", how wonderfully smooth the voice sounds – yet at the same time with a never-before experienced inner tension – and the differentiation of internal dynamics are more clearly illustrated than I've ever known. As it grows louder the vibrating of the voice fills the room, nothing less than sensational: this is how this voice ought to sound! I would love to introduce you to so many more titles: the incredibly energetic vocal track by Dawn Muir on „Poetry" by Brainticket (Hallelujah YZ393, 7", IT), recorded by the brilliant Hellmuth Kolbe, and the sometimes eerie spatial tangibility of vintage jazz recordings like Jazz Track by Miles Davis (Columbia CL 1268). However, soon, forthcoming cartridge reviews will provide cause to draw from the Acoustical Systems Axiom again. It uniquely brings the immortalized music in the grooves to life, just as clearly as it highlights the differences between cartridges. Even if they then appear to be far less important than the tonearm itself. Sonically a milestone. ▢

Tonearm Acoustical Systems Axiom

Principle: 12-inch tone-arm with gimbal bearing **Features:** Nano instrumental bearings, magnetic tracking force adjustment, very little skating, mounting distance 233 mm as with 10-inch arms **Effective mass:** 16 grams **Accessories:** Axiom mounting template with UNI-DIN tangential geometry **Versions:** silver or black, in matt or gloss **Weight:** 890 grams **Price:** 16800 Euros (matt), 17800 Euros (glossy)

Contact: acoustical systems, Dipl.-Oek. Axinia Schäfer, Alpenstraße 26, 86935 Rott, www.acoustical-systems.com