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An Unattainable Goal...
A Short History Of Passive Linear-Tracking Tonearms.

by Roy Gregory

Linear-tracking tonearms might well be considered the Holy Grail of analogue replay. But their history is long and convoluted, and littered with hard lessons. To really appreciate where the latest assault on this particular Everest, the Kuzma Airline, stands in the light of the saga, it's necessary to understand the trials and tribulations that have afflicted the evolution of the species. Those who've owned an air bearing tonearm in the past may choose to skip this part, having learnt the contents (or at least their practical implications) by bitter experience. For the rest of you, here's the long and tortuous road leading to the current state of grace.

Why bother with linear tracking? It's a pertinent question given the level of engineering required to make the approach work even half successfully – especially when compared to a basic uni-pivot design or a Rega RB300! The answer lies in the fact that the cutter head on the lathe that actually cuts the groove moves in a straight line across the record. Any arm that's pivoted moves the stylus in an arc across the record, constantly changing its angle to the groove walls. Careful attention to geometry and set-up can minimise the effect, but once you've heard a decent linear-tracker then the tracing distortion that's inherent in every pivoted design becomes increasingly hard to ignore. So hard that the theoretical issues with passive parallel trackers, the sheer level of engineering needed to overcome them, and the demands and limitations they place on turntable and cartridge design (almost) begin to seem worthwhile.

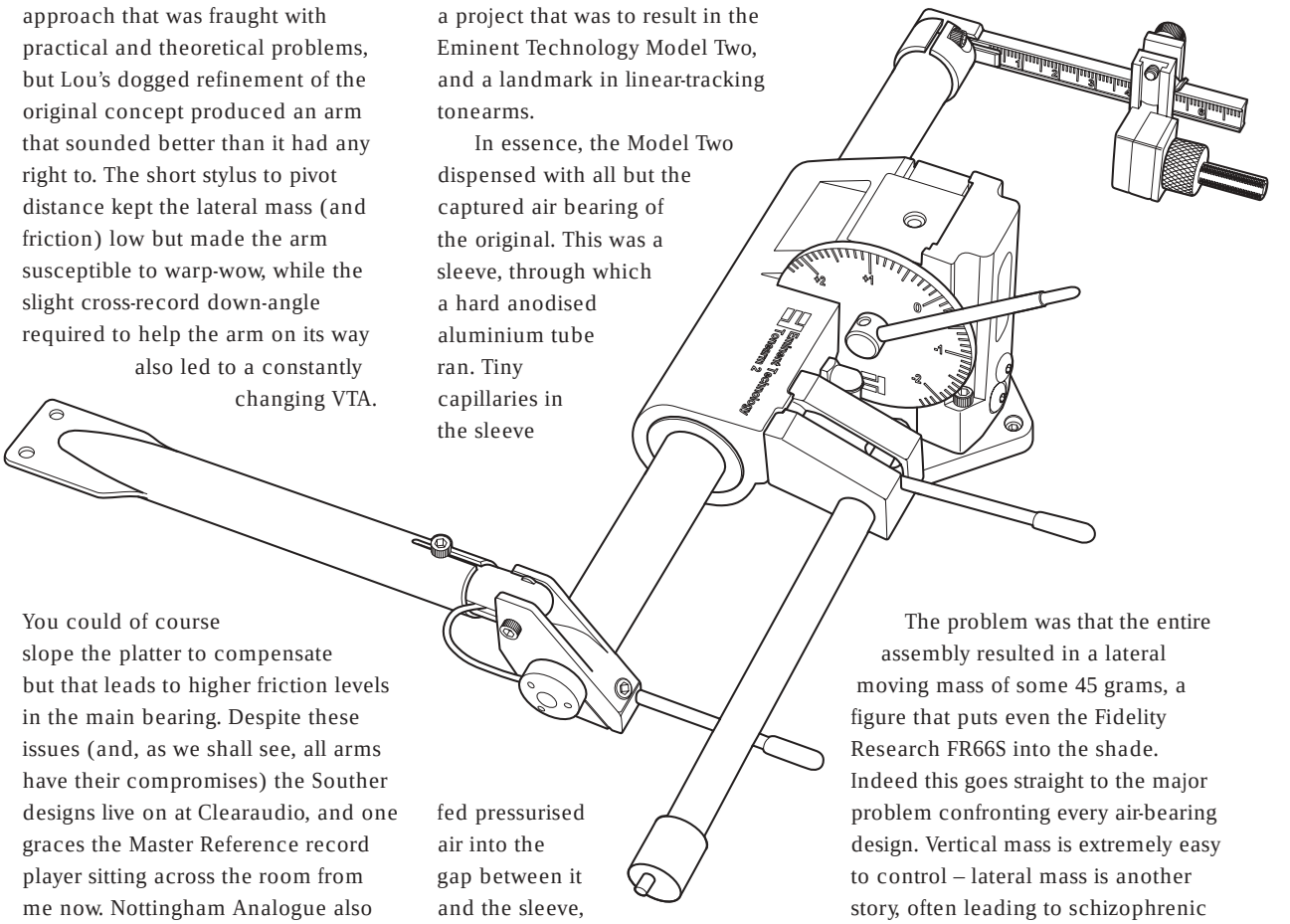
Of course, linear tracking tonearms never started out passive at all: The earliest examples, from B&O and then Rabco I believe, were servo driven. The arm was horizontally pivoted to move through a very narrow arc. As the stylus moved across the record the armtube deflected from true tangency, and once this angular error reached a given size a sensor activated an electric motor that shuffled the pivot point forward a bit. The end result was an arm that moved laterally across the record, albeit in a series of small arcs. So not really a linear tracker at all then.

This didn't stop the approach achieving serious significance, especially once it had been picked up by Technics and JVC. The Japanese managed to refine the servo mechanism and further reduce the tracing error, but it's difficult to avoid the suspicion that they were more interested in a plausible marketing opportunity and the attraction of (optically detectable) track programming than ultimate performance. As far as the mass market was concerned, the genre reached its apogee with the LP sleeve sized Technics SL10 and the various Mitsubishi music centres that played the record clamped vertically: From the sublime to the ridiculous. Indeed, the SL10, with its compact dimensions, integrated moving-coil cartridge, internal phono-stage and line-level output, was way ahead of its time. It also sounded pretty good too. But one fact is inescapable, it was the adoption of linear-tracking technology by the Japanese majors (and to a lesser extent by B&O) with their global marketing power and international advertising campaigns, that locked the concept so securely in the public consciousness.

And in a brief aside, audiophile companies were far from immune from the attractions of the worldwide band-wagon, with the Goldmund T3F taking honours as the most expensive, complex and ultimately unworkable iteration of the technology. This was a computer driven servo controlled tonearm in the days when computer power was measured in kilos rather than gigs! To suggest that it had a mind of its own overestimates its intelligence. It rarely did as it was asked, and often as

not set off for the middle of the record unprompted – particularly alarming when you consider that your valuable stylus way perfectly in line with the platter spindle!

The genuine audiophile approach to linear tracking lay elsewhere, with passive operation. Lou Souther was arguably the first designer to pursue this route, his tonearms running on ultra-lightweight, wheeled sledges supported on quartz rails. It was an approach that was fraught with practical and theoretical problems, but Lou's dogged refinement of the original concept produced an arm that sounded better than it had any right to. The short stylus to pivot distance kept the lateral mass (and friction) low but made the arm susceptible to warp-wow, while the slight cross-record down-angle required to help the arm on its way also led to a constantly changing VTA.



You could of course slope the platter to compensate but that leads to higher friction levels in the main bearing. Despite these issues (and, as we shall see, all arms have their compromises) the Souther designs live on at Clearaudio, and one graces the Master Reference record player sitting across the room from me now. Nottingham Analogue also produce a variation on the theme, with a longer, wheeled tonearm running on a wire, but I have no experience with the device.

Which brings us to air-bearings, and the first truly frictionless, passive parallel trackers. The earliest example I came across was the original Eminent Technology. It was crude, awkward in the extreme, but - and it's a big but – it hinted at what was possible. Indeed, such was its performance that you could say it pointed the way, to the extent that the arm's designer, Bruce Thigpen, was contacted by New York audiophile and Eminent Technology owner Edison Price. As a lighting designer by trade, Price had a few pertinent suggestions as to how the original design might be improved. Combined with Thigpen's own thoughts on the subject, they amounted to a complete redesign, a project that was to result in the Eminent Technology Model Two, and a landmark in linear-tracking tonearms.

In essence, the Model Two dispensed with all but the captured air bearing of the original. This was a sleeve, through which a hard anodised aluminium tube ran. Tiny capillaries in the sleeve fed pressurised air into the gap between it and the sleeve, floating the tube and allowing it to move freely through the sleeve. And I do mean freely. The first time you touch an air-bearing the lack of resistance comes as quite a shock – a fact reinforced by Louise's reaction to the Airline. Perfectly at home with the frankly bizarre operation of the Clearaudio, she was totally unnerved by the free movement of the Kuzma arm This lack of friction is of course the key to any air-bearing tonearm. Incorporating it in a mechanically acceptable way is the headache. The original ET used the bearing placed horizontally beside the platter, an arm-wand on one end of the tube, the counterweight at the other, the two masses designed to balance each other through the axis of the bearing and minimise tipping at either end of the arm's travel.

The problem was that the entire assembly resulted in a lateral moving mass of some 45 grams, a figure that puts even the Fidelity Research FR66S into the shade. Indeed this goes straight to the major problem confronting every air-bearing design. Vertical mass is extremely easy to control – lateral mass is another story, often leading to schizophrenic mechanical characteristics.

Thigpen's response was typically direct. He hung the counterweight on a lateral leaf-spring so that the cartridge wouldn't see it in the lateral plane, thus reducing the horizontal effective mass to around 25 to 30 grams – still high, but manageable with lower compliance cartridges. Meanwhile, Price went to town on the construction and ergonomics

of the arm. The bearing was dropped to place its centre at the same height as the record surface, improving tracking of warps. At the same time he totally redesigned the arm's mounting. Molded from aerospace plastics the new structure was revolutionary. The bearing fixed to a vertical post through a curved interface whose radius was calculated to perfect tangency. A lever, detachable gauge and gear allowed the owner to move the bearing up and down the post, offering repeatable on the fly VTA adjustment without disturbing tangency/overhang. Meanwhile, the base itself employed a triangulated support plate that allowed the user to tilt the bearing in order to achieve perfect level. Theoretically less than ideal, this was definitely practical, ending the headache of trying to achieve perfect level from turntables that really weren't set-up to do so. You quickly discover that an air-bearing is far more sensitive than any spirit level.

Price also designed a superb set-up and alignment jig. But his piece de resistance was the cueing device. This was simplicity itself, an eccentric aluminium tube offering perfectly paced cueing, while a thicker end cap lifted the stylus clear of the front-edge of the record, parking it securely as well as eliminating any possibility of the dreaded side-swipe. It was a practical and ergonomic tour de force, but the best thing was that it only cost $850, including a small aquarium pump, making it cheaper than an SME 5. It remains the sole successful example of a mainstream air-bearing tonearm, and it sold in thousands.

But all was not sweetness and light. The ET Two might have solved many of the problems associated with passive linear trackers, but it didn't eliminate them. Specifically, it continued to suffer from its high lateral mass, an inherent flaw in the design. Indeed, any loss of pressure or blocked capillaries in the bearing and the arm would ground towards the end of a record, often grinding to an ignominious halt in the lead-out grooves, or even half-way through the last track. The heavy cartridges popular at the time, like the crystal bodied Koetsus and Kisekis merely exacerbated the problem, with their requirement for heavy counterweights.

What's more, users were tempted to place the noisy pump as far from their turntable as possible, normally on the other side of a wall.

This often meant feeding cold air into a warm environment, producing condensation and corrosion within the bearing!

At the same time it became apparent that higher pressures in the bearing, as well as helping float it, also offered better sound, and a vibrant pre-internet underground pedaled tales of bigger and better pumps and reservoirs. This eventually led to the Model Two Point Five, with a damping trough, higher pressure manifold with tighter tolerances and increased diameter bearing tube but supplied without a pump, allowing users to fit their preferred model. The Wisa L300 seemed to be favourite, some people going so far as to use several in parallel. The new bearing delivered anything up to 8.5 psi but a slightly lower pressure of around 7.5 was often preferred. (For later reference, that's about half a bar – and that's the high-pressure version!)

At around the time the ET Two was appearing, we also saw the first Air Tangent, an expensive arm whose ergonomic shortcomings were cruelly exposed by the Eminent. In this case the bearing was arranged so that air was pumped into the circular beam, an aluminium sleeve floating on the tiny jets of air that emerged. This approach succeeded in reducing the lateral mass but was fraught with problems, the most important of which was that the sleeve only covered around one third of the beam's surface. The end result was that it was impossible to increase the pressure in the manifold as it simply leaked from the uncovered holes. In order to park the arm at the front of the record, the beam also had to extend well forward of the plinth, while the cueing device was arbitrary to say the least. It was a potentially disastrous combination. The design passed relatively quickly into history, to be replaced by far better versions, but it shows how easy it is to get things wrong.

Another Nordic oddity was the Forcell tonearm. This made no bones about close coupling the bearing, a long narrow shaft carrying a row of holes on its top edge. These floated a sleeve as per the air tangent, although a regulator allowed you to set "ride-height". Like the Tangent, it also suffered from whistling when holes were partially covered, but ergonomically it was far better, with a decent cueing system and a clever parallelogram arrangement for VTA adjustment. Somewhat against the odds, the Forcell arm remains one of the finest sounding that I've

ever used, offering similar clarity and dynamics to the Southers, models that it in some ways most resembles. It was however, a tweeker's nightmare, with every adjustment audible, whether we're talking VTA or the bolt that the cueing device pivoted on. Using it on a day to day basis was a short road to audio nervosa.

The next real step forward came from Rockport, the first to introduce an inverted air bearing. In this instance, the air is pumped into a sleeve that moves on a static, polished beam. It's an approach that cuts right to the heart of the genre's problems by allowing the use of a high-pressure manifold of minimal size and mass. All at once, air-bearings started to look really practical, even if the declining vinyl market made them inordinately expensive. The Rockport arms were the wrong side of £6000, while the Air Tangent Reference (a sort of cross between the Rockport's bearing and ET ergonomics, complete with remote control VTA!) was just over £10000.

That brings us almost up to date: The Air Tangent has been replaced by a new, simpler and cheaper model that is still waiting to see the light of day: The Rockports are no more and nor are the Eminents. In many respects it's still the latter design that remains the most impressive. Offering superb practicality coupled to a bargain price-tag it's by far the nearest thing we've had to a genuinely successful passive linear-tracker. It's Achilles heel was its high lateral mass, imposed by the choice of bearing. But what would happen if someone applied the lessons learnt from the ET Two and subsequent experience to the bearing that graced the Rockport and later Air Tangents? And what would happen if they could drop the price at the same time? Time to take a look at the Kuzma Airline.

The Kuzma Airline Passive Linear-Tracking Tonearm

The preceding pages cover some of the hard lessons learnt in the pursuit of a true, passive, parallel tracking tonearm. There are the inevitable compromises that afflict any chosen design path. There are also practical considerations. In order to succeed, any arm needs to address both. Or, to put it another way, it's no good making an arm that sounds brilliant if nobody can use it. It's a salutary lesson that the superb ergonomics of the ET Two made it more approachable and accessible to a public who proved happy(ish) to tolerate the problems of getting it to run to the end of a record! Let's take a look at the Kuzma with respect to these considerations.

The Bearing Assembly

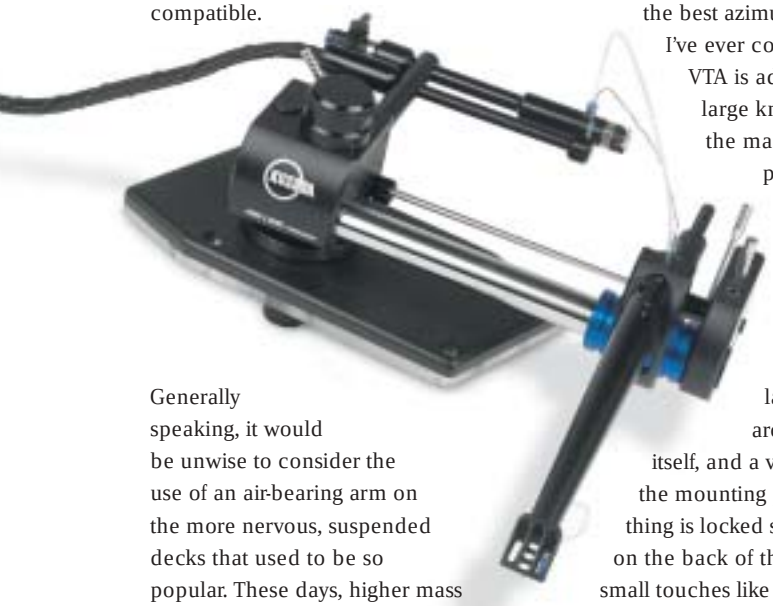
Common to previous designs from both Rockport and Air Tangent, there's absolutely no question that the bearing used in the Airline is the best currently available. However, you still have to realise that potential, which means feeding it properly. Kuzma supply a sophisticated, oil cooled and damped compressor, a substantial beast capable of generating up to 12 bar. In practice it actually runs the arm at 4.5 bar, compared to about 2.5 for the Rockport and later Air Tangents. More pressure and tighter tolerances mean a stiffer bearing, vital to achieving the superior rigidity available from air-bearing designs. It improves self centering of the bearing which in turn improves tangency by preventing the sleeve rocking sideways on its shaft.

So, plenty of pressure – what about operating it? The compressor is equipped with two gauges, one for reservoir pressure, the other for manifold pressure. Simply run it up to a reservoir pressure of around 8 bar, then open the outlet regulator to feed the arm the desired 4.5 bar. The air itself is fed down a small black hose of refreshingly narrow dimensions, making accommodating its passage rather easier. The compressor feeds an inline filter and dryer unit that is placed adjacent to the turntable, eliminating the potential problems of remote siting the compressor by removing condensation (or oil mist). This then finally feeds the air into the arm, which is equipped with its own valve (so that you can shut off the air when not in use) and a basic pressure gauge so that you can keep an eye on the manifold pressure without going to look at the compressor. One other nice touch is the simple push lock air connectors that make lacing the whole thing together simplicity itself. So full marks all round then, as far as the bearing and air supply go.

Set-Up and Alignment

Perfect alignment of any arm and cartridge is critical to its performance, but especially so if you are planning

to realise the potential benefits of linear tracking. The arm itself mounts to the same Linn cut-out as Kuzma's Stogi Reference tonearm, making it geometrically compatible with most turntables. That of course is not the same thing as being mechanically compatible.



Generally speaking, it would be unwise to consider the use of an air-bearing arm on the more nervous, suspended decks that used to be so popular. These days, higher mass designs are increasingly the norm, and they are generally ideal for the Airline. Solid plinth designs present no problems at all, but you need to think about the leveling issues if you are intending to use the arm on a high-mass suspended unit. The review arm was supplied on a Kuzma Reference, which not surprisingly worked fine with its top mounted adjusters. Getting the deck level, using the arm as its own indicator was simplicity itself, although don't underestimate the precision required, especially with an arm this heavy – the Airline weighs in at a cool 2 kilos. A deck like VPI's air suspended HRX might prove more fiddly, although with its higher mass, wider stance and stable suspension, once sorted it should remain so.

The arm also arrives with a protractor/jig that helps with initial alignment. These should be mandatory with all linear-tracking tonearms. Overhang is handled by the simple but effective expedient of headshell slots, while the massively tapered tonearm tube allows extremely precise azimuth adjustment via two locking screws and a set-screw, located near the bearing manifold. Similar in concept to the system employed on the Tri-planar, it is mechanically superior and by far the best azimuth adjustment I've ever come across.

VTA is adjusted by the large knob on top of the main mounting post. Once again it is a system familiar from the Rockport arm, but crucially, Kuzma provide both a lateral graduation around the knob itself, and a vertical scale on the mounting post. The whole thing is locked solid by the lever on the back of the arm. It's the small touches like these that make the arm so easy to use. Even the counterweight has received a makeover, the long, narrow sleeve helping prevent resonance of the counterweight stub assembly itself.

Oh, and for those who don't believe in VTA (although why such a Luddite would buy an Airline is beyond me) the steel post that passes through the "floating" end of the arm, opposite the mounting post, can be dropped and locked in place to ensure the bearing shaft's stability. Given the massive construction I reckon that's overkill, and I'd employ the option to remove it, which certainly improves the appearance of the arm.

Ergonomics

Once mounted, the fit, feel and mechanics of the arm are superb. I've already mentioned the excellent hose connectors and the simple yet effective VTA adjustment. Well you can add to that a superb cueing action, complete with parking slot to keep the arm out of the way when changing records. The bearing was totally trouble free, as was the compressor.

One touch I particularly like is the one-piece arm cable. So many parallel tracking arms cop-out here. Getting the signal out of the armtube is an issue, because a poorly dressed wire can significantly increase the sideforce seen by the cartridge – in this case the audio equivalent of treading on the tonearm's corns. As a result, designers tend to opt for the lightest cable they can, simply running it out to a phono termination box. This in turn dumps the dealer/owner with the job of locating that box and providing a suitable lead-out cable. Apart from the extra cost it's just another thing to get wrong. Kuzma install a purpose designed Cardas arm-cable, enabling them to run a single conductor path all the way to the phono plugs, without impeding the arm's lateral movement. It also eliminates an audibly damaging join in the arm lead, just when the signal is at its smallest and most vulnerable.

Qudos also for supplying a reasonable length of cable and terminating it with the cheap looking but superb sounding Bullet plugs. If the arrangement doesn't suit, other options also exist.

As a package to use, the Kuzma comes closer than anything else to my ET Two ideal, and does so while playing records impeccably. It's nice to see a product that's happy to learn the lessons of the past to improve the future.

Other Considerations

So what's missing then? Well, most notably there's no damping trough. Easy to provide, as witnessed by their presence on just about every parallel-tracker since the ET Two, I've never felt the need to use them, so I'm not going to feel the loss.Besides which, you only really get any benefits if you're using an inappropriate cartridge. I think the comment above regarding Luddites also applies here. You could argue that it would widen the arm's compatibility. I'd respond with "Why bother, given the massive range of low-compliance cartridges that will work perfectly well?"

On a more practical note, the dimensions and positioning of the mounting post leave very little clearance (about 15mm) between the arm and record. You need to bear this in mind if you are intending to mount the arm on a deck with either an oversize platter, or one that uses a peripheral clamp, like the VPI HRX or the one available for the Clearaudios. It's not impossible – but you need to check.

The final issue with the Airline is its appearance. Purely a matter of personal taste I know, but compared to many of its predecessors, the Kuzma is very big and very black. I really like it, but experience shows that my views and those of the public rarely accord.

One thing I will say is that it's refreshingly free of the gold plate that so many manufacturers seem to feel instills a touch of class. The Airline is all business, and as far as I'm concerned it's all the better for it.

I used the Kuzma arm with three different cartridges: Kuzma's own KC Ref, the Clearaudio Accurate and the Lyra Titan. In my system it was the last of these that gave the best overall balance, and which I used the most, however, more on that later. The rest of the set-up included the Tom Evans Groove Plus, feeding either the Vibe/Pulse combination or the Hovland HP100. Power amps were the Hovland RADIA or Jadis JA30s, with either Gryphon Cantata or the latest Living Voice OBX-R loudspeakers. Cabling was Nordost's Valhalla while everything was supported on either the finite elemente HD-03 Master Reference or Clearlight Aspect racks. Mains arrived via Russ Andrews leads and blocks, the Nordosts arriving just too late to join the party.

So, is it worth the bother?

With everything optimized the sound that greets your (by now) hungry ears is definitely worth the wait. The Airline sounds different to, and better than any other arm I've used, assuming you put it on an appropriate 'table. (Please, please note that caveat. Mount this arm on the wrong deck and you'll open a Pandora's Box of frustration and disappointment.) Indeed, its presentation is so natural that I hesitate to ascribe it a character. However, it does have distinct properties that separate its performance from other arms, some to do with its linear tracking, others unique to it.

To a greater or lesser extent, all linear tracking arms offer a significantly more natural stereo perspective than their pivoted cousins. This arrives hand in hand with greater dimensionality and lower levels of grain. There's also a naturalness to timing and an ability to let music breathe. The Kuzma does all of these things, and in each case to a greater extent than I've heard before. The difference between the presentation of this arm and an SME is really quite shocking, the pivoted arm sounding gray, constricted and mechanical in comparison, almost as if the signal has been strained through it.

Impressive enough, but I haven't started on what I consider to be the Airline's really unique quality. The sonic picture established by the Kuzma is astonishingly solid and stable. It's remarkable just how much most images wander and shift, a failing you only really notice when you're presented with something as rooted as the Airline delivers. But this is about more than just sheer

physical presence. Keeping those images locked firmly in space contributes enormously to the ability of the performance to convince. In turn, that allows the listener to relax and engage. It's a bit like reducing the load on your error correction – suddenly you don't have to work nearly as hard. It's an effect I first noticed with CD players, but believe me, it applies to analogue too.

All those stable, solid, dimensional images reflect the quality of the acoustic itself. But again, the Airline extends the effect beyond previous experience. The lack of grain allows black, black space around and behind the performers, increasing the arm's transparency and focus. It also increases the immediacy, eliminating the distinction between the space in which the listener sits and the acoustic in which the performance occurs. It's a quality that first became apparent with the original Groove: The Groove Plus extended it, and so too does the Airline.

Of course, it's impossible to discuss the imaging and soundstaging of the arm without discussing the cartridge(s) being used. As I mentioned, I used the arm with three different cartridges. The KC Ref was impressively powerful and solid sounding, delivering superb presence and instrumental colour. The stage was extremely wide but a little shallow. The Accurate was dynamic and fiery but a little too forward in the bass, with a huge acoustic but poorly defined boundaries. The Titan delivered, fast, focused and extremely transparent sound, with superb dynamic discrimination within a slightly narrowed but extremely deep and well defined acoustic space.

Reading that lot should tell you quite a bit about the performance of the tonearm. Firstly (and reminiscent of the Triplanar) it allows each cartridge to perform at its best, making the most of its particular strengths. I opted for the Titan, but it's as much a case of the qualities required by the system and listener as any inherent superiority of the cartridge itself, or its match to the tonearm. In practice, each of the cartridges used seemed equally at home, tracking with ease whatever was thrown at them. Which brings us to the other obvious conclusion drawn from the evidence. This arm needs no help whatsoever in terms of low-frequency weight, definition or dynamics.

Bass performance sets new standards. It is tight and defined without any sense of constipation or constraint. It breathes, it has texture, excellent pitch definition and differentiation. It matters not whether you challenge it with driven electric bass, synthesised eruptions or the worst excesses of a full symphony orchestra (it's that *Tosca* again!) the Kuzma encompasses every demand and delivers without any apparent effort or strain intruding. The sheer confidence and stability of its bottom-end is key to the whole performance of the arm. That and the way it handles dynamics.

The Clearaudio Master Reference record player has always set the standard as far as clarity, separation and dynamic discrimination goes. Until now. The Kuzma Stabi Reference/ Airline player, carrying the Titan matches the German deck for clarity and separation while delivering superior dynamic range combined with more convincing weight and colour. And it does it with total consistency, right across the range. It happily reveals the subtleties of brush and cymbal work, including the tiny variation in weight between strikes, even when the rest of a band is cutting loose – assuming of course that the information is on the record.

That ability to define shifts in energy levels at both ends of the dynamic spectrum, combined with the total security of the spatial and low frequency foundation combine to create the second unique property possessed by this arm: ease. No arm in my experience allows music the easy expression delivered by the Airline. Dynamic level and nuance are so precisely modeled, especially in combination with the Titan, and so comfortably within the arm's compass, that the mechanics of record replay are effectively banished from the listening equation. It is similar to the influence of the Rockport Sirius III, except that there we were talking about an entire air-bearing record player, and one that didn't deliver the Airline's dynamic range. (Of course, getting the arm exactly horizontal should also mean getting the main

bearing perfectly vertical, which will also minimise the audible contribution THAT makes to proceedings.)

Roll all these things together and what do you end up with? Music. More to the point, music that is convincing, because it's stable and solid yet unforced and full of energy and colour. Listen to the John Coltrane Quartet playing *Ballads* (the superb Speakers Corner re-issue – a record you really owe yourself) and the music exists in its own space and moves with its own tempo. The relationship between the players is clear without destroying the intimacy or understanding. The performance is everything: the record, the turntable and the electronics all recede from aural view. The logic is as clear as it is well established. Give a system a good enough signal to work with and suddenly the amps and speakers become a lot less obvious, simply because, just like you, they have to work a lot less hard. The Kuzma Airline does exactly that. It retains so much of the energy and information captured by the cartridge from the record's groove that everything else sounds like a pale imitation in comparison. What's more, it manages to make sense of it all too, without fear or favour when it comes to frequency.

Normally I try to explain my sonic conclusions with reference to specific musical examples. There simply isn't the space to do so here. The copy is already overlength, and that's with the history lesson delegated to a separate piece. However, having spent so long trying to explain just why this arm is so different (and so superior) to any other, perhaps I should try and relate it to at least one musical experience.

The Analogue Productions 180g pressing of the Janis Ian album *Breaking Silence* is a sonic (particularly a dynamic) tour de force. In a vivid exception to the audiophile rule it's equally powerful musically speaking. You want to blow your mates' socks off? This'll do it every time – which is why you hear it so often at hi-fi shows. But steer away from the sheer dynamic impact of tracks like 'Walking On Sacred Ground' or 'Breaking Silence' itself and you can actually learn far more about a system. 'Some People's Lives' is the narrowest band on the whole album, despite running nearly four minutes long. Just voice and piano it doesn't demand the groove widths of the dynamic blockbusters. But listen to it with the Kuzma front-end carrying the Titan and you'll be rewarded with a piano that's big, solid, stable and unmistakably percussive. It is at once sonorous and weighty, yet the delicacy and sensitivity of the playing is captivating. The voice too, is stable and real, with the substance of a real person behind it. Yet it still retains the expressive fragility that makes this such a powerful song. It's a performance that encapsulates what's so wonderful about the Kuzma Airline. Stable, solid and totally in control, it has the confidence to allow music the full range of expression, from total bombast down to gossamer frailty. And that's based solely on its performance on the Stabi Reference. It's entirely possible that there's more to come if it's mounted on a rigid platform like the Clearaudio Master Reference or Kuzma's own Stabi XL. Then there's always the VPI TNT HRX. My record collection has been rejuvenated in the last few years.

First came the Groove, then came the Triplanar. Now comes the Kuzma Airline. But whereas the Triplanar dealt in refining the already possible, the Airline extends the performance boundaries far more dramatically. Audiofreaks are fortunate indeed to possess both the best pivoted and now the best parallel tracking tone-arm available. The Triplanar's in residence already – all I have to work out now is how (and where) exactly to accommodate the Airline.

TECHNICAL SPECIFICATIONS

Price: £4,700

UK Distributor:
Audiofreaks
Tel. (44)(0)20 8948 4153
Email. info@audiofreaks
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