

Acoustical Systems

Axiom & Aiwon

Extracting all the musical details
from the vinyl groove

Author | Lee388
Translator | Paul Leung



DR. FEICKERT ANALOGUE

If I ask you what is the shape of a wheel, you would find the question so weird. This is something even a kindergarten pupil could answer. Why bother asking? However, if I bring you back to 6000 years ago, a time before a wheel was invented, you wouldn't be able to tell me wheels are round! The German tonearm that I'm about to introduce, even though it might not be as influential to the world as the invention of wheel, has a lot of features unseen elsewhere. These features might look very obvious. However, just like the wheel example, if these features had never been invented, how would people know these features should have even been existed?

The chief designer of Acoustical Systems, Mr. Dietrich D. Brakemeier, was not working full time in Hi-Fi systems design at the beginning. He used to be an audiophile just fascinated by music and analogue systems. He is experienced in mechanical engineering. As such, he founded Acoustical Systems and produced a wide range of products for vinyl systems. Previously I reviewed some of his products, e.g., SMARTractor, for calibrating tonearm and cartridge (see Issue 390, March 2014). I also reviewed the Arché headshell, Archon cartridge and the flagship Aiwon cartridge. This time, I'm reviewing the flagship tonearm, Axiom.

Starting with the package

It's easy to tell if a product was designed and produced with heart by looking at the details in the product package. Axiom comes with a beautiful and strong aluminium case. After opening the case, I can see a nicely printed manual and an acrylic made calibrator specially designed for Axiom, which are enclosed in another plastic box. There is another smaller aluminium case which keeps tools and screws in safe and orderly manner. Through these details, I can easily tell how much passion and hard work have been poured into this product.

I just mentioned that there are features in Axiom unseen in other tonearms. The first one is the ability to adjust Vertical Tracking Alignment (VTA) in the headshell. This is a feature identical to the Arché headshell, also designed by Dietrich. In typical tonearm designs, VTA is adjusted through the height of the arm base. Dietrich thinks that this is not precise enough. When the height of the arm base is changed, the geometry of the tonearm will also be changed. More importantly, the tonearm will not be in the perfect level position any more. The vertical tracking force (VTF) will also be changed. As such, Dietrich came up with a novel solution, as seen in Arché, to adjust the VTA in the headshell to minimise the impact to the tonearm geometry. He successfully integrated Arché into Axiom to make it the world's first tonearm which allows VTA adjustment in the headshell. Besides, this design allows the

adjustment to stylus rake angle (SRA) which makes significant acoustic difference.

Independent levelling of tonearm

Another unique feature of Axiom which worths mentioning is that the tonearm is mounted using only one M5 screw. It requires a 9" or 10" mounting plate even though its effective length is 12". Besides, I found a feature that I like so much. The arm allows levelling independent of the turntable. The arm comes with a number of mounting plates of different thickness for different vertical distances between the turntable and armbase. There are three small spikes around the M5 screw. These spikes can be used to level the tonearm. One can place a leveller on top of the bearing house which has a perfectly flat surface on the top. It is a very smart and useful design given that levelling is so important to vinyl playback. The ability to adjust the level of the tonearm independent of the turntable is a great idea indeed.

Bearing system with nano precision

The arm wand of Axiom is made of super hard titanium. Beneath the titanium layer, there is a carbon fibre tube. The gap between the carbon fibre tube and the titanium wand is filled with dampening liquid. According to Dietrich, this design requires extreme precision to manufacture and assemble. In Germany, he found only one factory with the capability to go to that level of precision. The dampening liquid and the



layered structure allow the signal picked up by the cartridge to be transmitted unaltered. Also, they effectively dampen the vibration from the wand and other sources. The arm cable running inside the wand is medical grade silver wire from Siemens in 1960s. With such a long ageing process, these silver wires are ideal to keep the sound natural and pure. Also, as these wires are thin and flexible, they are very ideal for making tonearm cable. Axiom adopts Gimbal Bearing. The bearing is made by a reputable nano grade manufacturer in Germany. All dimensions and contact points are measured in nano metres. Friction is ultra low too. If you have a chance to lift the arm wand and move it up, down, and side way, you will feel how smooth the movement is. Better still, you can feel the whole structure is rigid and leave absolutely no gaps between joints.

Adjusting tone color via anti-skating

Axiom uses magnetic mechanism to implement anti-skating. There are three pieces of small magnetic blocks with different magnetic strength just above the bearing house. The tonearm is therefore subject to different anti-skating force in three different positions. As most experienced vinyl fans know, the closer the stylus towards the centre is, the larger anti-skating force is needed to reduce sound distortion. With this three magnet scheme, Dietrich effectively solved the problem. There is also a small screw near another magnet to enable the user to adjust the anti-skating force. If the screw is tightened and gets closer to the magnet, the affinity between them will get stronger and the anti-skating will also get stronger. From my listening experience, I found that if the screw and the magnet are getting too close, the sound will become too tight. In the worst case, the stylus will lose traction when getting close to the centre. Hence, it's important for the user to make sure the screw is not overly tightened. After all, you will need to rely on your ear and taste to optimise the anti-skating force. In fact, the combination of the static and dynamic anti-skating in one tonearm is unique to Axiom.

Adjusting VTF during playback

As most LP audiophile know, vertical tracking force (VTF) is critical to the acoustic performance. The designer of Axiom spent a lot of efforts in this aspect and the result is outstanding amongst its competitors. Apart from the main counter-weight which is typical in conventional design, there are another set of weights. These weights adjust the lateral balance of the tonearm. The user will have to spend some efforts to fine-tune these weights so that the tonearm has a slight tendency to move towards the centre of the turntable, which is different from the typical tonearms. Aside from the primary weight made of Tungsten, there are three other auxiliary weights (namely 'trim weight' as described in the manual) made of different materials, namely stainless steel, copper and aluminium, for user's choice. The user will need to pick one according to the compliance of the cartridge. As the mass of the primary weight is high, a slight adjustment in its position will significantly change the VTF. Hence, when the primary weight is in a position close to the desired VTF, the user can use the trim weight to fine tune the tracking force.

Once the fine tuning is completed, there is another screw on top of the bearing house which allows the user to further fine tune the tracking force using an Allen key. The fine tuning can be done "on the fly". The idea is that the VTF is adjusted using a magnetic mechanism during playback. I recommend the user adjust the screw to the mid point before fine-tuning the tracking force to leave sufficient room for adjustment in both directions. Dietrich told me that, as Axiom has excellent compliance in its bearing system, the user can start with the minimum tracking force of the cartridge and slowly increase it to get the optimal value through listening. The optimal value will give you more three dimensional imaging and accompanying music with better clarity.

UNI-DIN Geometry for modern records

According to Dietrich, he designed Axiom out of his 30 year experience in analogue systems. He spent quite a few years in research and experiments. His ultimate goal is to pursue reality in music reproduction by extracting every detail from the vinyl groove. This was the world's first and only (at the time this review was authored) tonearm that adopts UNI-DIN geometry. What is special about UNI-DIN? As you know, a typical tonearm is based on geometries developed in 1930s in which 78rpm shellac mono records are prominent. Dietrich felt that there is a lot of room to improve as 33 1/3 rpm or 45 rpm stereo vinyl records are more prominent today. He came up with a new geometry called UNI-DIN. He also implemented SMARTractor, a tool for setting up cartridge and tonearm, support UNI-DIN. Basically, the idea of UNI-DIN is to move the two null points towards the centre of the record and reduce the fluctuation of the tangential curve. This approach takes



advantage of the fact that human errors are less sensitive to absolute acoustic distortion than relative distortion. This is evident when we perform AB comparison. Reducing the fluctuation of the tangential curve works well with this theory. It reduces the variation of the tangential errors when the stylus is moving from the outer rim to the inner rim. As such, we perceive more pleasing and smooth sound when using a tonearm conforming with the UNI-DIN geometry.

Playback with the flagship Aiwon cartridge

I spent months to pair Axiom with different cartridges, the results are surprisingly good. Honestly speaking, I don't think the tonearm was just designed for convenience in setup and calibration. It is really designed in mind to achieve the best possible sound. Every time when I changed cartridge, I spent a lot of time to optimise the settings of the tonearm. This is not the most ideal situation for beginners. But if you are experienced, you will certainly appreciate these features. Especially when you come up with your favourite sound, the joy and satisfaction are indescribable. The last cartridge I used with Axiom was Aiwon. This cartridge has 7N pure silver coil and titanium shell melted with 24K gold which is resistant to resonance. The internal impedance is 4.2 ohm. The output is 0.28mV. The recommended tracking force is 1.7g. Each

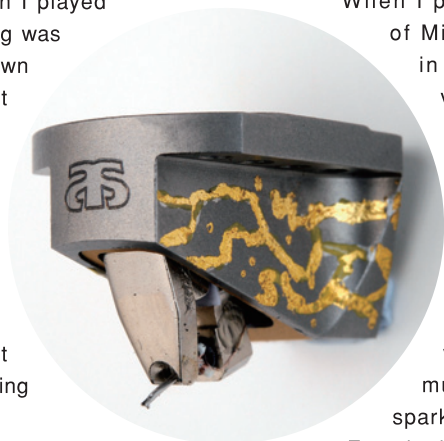
cartridge was carefully calibrated before leaving the factory. I tested this cartridge and tonearm with German made Dr. Feickert Analogue Firebird. The preamp and phono amp were Burmester 808MKV and its MC3 module respectively. ASI Liveline Reference power cable is used for the preamp. The power amp was Burmester 909 with Burmester Power cable. Loudspeaker used was TIDAL Contriva G2. The signal cables and the loudspeaker cables were Burmester's silver cables.

Direct reflection of the recording quality

As I mentioned above, it takes some efforts for me to change cartridge. But practice makes perfect. After months' of practice, I got a good grasp of various features in Axiom and calibration has become a lot easier. Calibration is nothing more than adjusting VTF, Anti-skating, VTA/SRA, Azimuth etc. The protractor come with the tonearm makes calibration extremely convenient. To test the whole setup, I started with 150g vinyl record of a famous HK singer, Sally Yip, who has her own name as the album name. It is also one of my favourite canto-pop albums so I played it very often. However, with Axiom, I felt like I'm listening to this album for the first time. The guitar sound was exceptionally clear at the beginning of the first track "Ten past twelve midnight". The image of the singer hung between two speakers in an



extremely three dimensional manner. Details from lips and teeth were very detailed but not exaggerating. I could easily feel the tenderness and beauty of Sally's voice. The music is moving indeed. This ordinary recording sounded as if it were an audiophile album. Interestingly, when I played the second track "Crazy Girl", the recording was not as good as the first one. It's well known that pop album of that time shows different recording quality in each song in the same album. Signature song typically gets better recording quality than the others. When I played the second track in other systems, I didn't notice it was so much different from the first one. But with Axiom and Aiwon, the difference was particularly obvious. It's evident that this tonearm and cartridge are very revealing whether the recording is good or not.



I found the Axiom and Aiwon have higher ability to reveal subtle details than any other tonearms/cartridge combination I have listened before. The first track "Lost in Madrid Part I" in "Siesta" sound tracks produced by Marcus Miller and Miles Davis created an extraordinarily thrilling experience. My attention was totally drawn to the music. I almost forgot that I was supposed to pay more attention to the acoustic performance for the sake of auditioning. When Miles Davis started playing his trumpet, the whole ambience changed dramatically. The bass was muscular and powerful. Fine details of various instruments were thoroughly revealed. Axiom did not lose any single bit of detail in the groove. The energy generated from the vibration of the stylus was transformed into electricity in full perfection. Even the finest detail was preserved.

Authoritative bass reproduction

Now here comes the Mickey Mouse. Why Mickey Mouse? I played "Apprentice of Sorcerer" composed by Paul Dukas.

When I played this piece of music, the picture of Mickey Mouse carrying buckets of water in Disney's "Fantasia" animation became vivid in my head. This piece of classical music was very Hi-Fi - especially with its extreme dynamics. The sound stage was reproduced quite effortless. The music was very lively and realistic. Axiom and Aiwon did a marvellous job in reproducing the fine details of the brass and wood wind instruments as well as their tonal variations. When the music reached the climax, the brass was sparkling. The bass was extremely ferocious.

Even in the most complicated movement, the sound didn't appear to be chaotic at all. This proved that Axiom was very resistant to the vibration come from the external environment. However, "Apprentice of Sorcerer" was not the most critical tester. I found another one more challenging. It's "Däfos" (45rpm) from Reference Recordings. I didn't play it for a long time because I was never able to play it well. I almost forgot about this record until I heard the acoustic performance of Axiom + Aiwon. I was tempted to see if this combination could yield better sound from this record. I was amazed to realise the earthshaking dynamic they delivered. The bass was powerful and deep enough to shake my listening room. Its bass performance is indeed authoritative. There was a section in which I heard somebody hit a water pipe. The sound was so real as if it happened right in front of me. The sense of space made





me feel that I was in the recording session. As the music was so rich in terms of Hi-Fi elements, it's very challenging for an analogue system to fully reproduce without distortion. But Axiom + Aiwon simply achieved this effect so effortlessly. Axiom might not to be the most affordable for many people. But from my experience, this tonearm is worth the money. Also, there are not many competitors which are really comparable with this tonearm in the market.

Adjusting VTA/ SRA in the headshell

Before concluding the audition, I played a live recording of Lola Bobesco's violin recital in Japan in 1983. It was an 33 1/3 rpm 180g LP (production limited to 3,000 copies globally). At first, I found the tone colour of the piano was a bit too dark. The violin did not sound bright enough either. After all, the music was a bit different from what I was familiar with. I thought there was a problem with the record per se but I eventually corrected the problem by adjusting VTA/SRA. It was very straightforward. All I did was to loosen the screw in the headshell and changed the vertical angle of the cartridge. When the angle was properly set, I tightened the screw. I played the same piece of music again. I heard the sound from the soundboard of the piano. The image of the piano was vivid as well. The violin sounded as light and smooth as swan feather. It was such a good opportunity for me to appreciate the advantage of the ability to adjust VTA/SRA in the headshell. With a simple step, the music sounded so much better. Also, I realised that the violin was hung high in the middle of two loudspeakers, the piano was positioned lower and behind the violin. This attributed to the well balanced performance of Aiwon.



Conclusion

If you judge Axiom using your eyes, Axiom might be something that is just built with good quality and a lot of attention to the details. The real strength of this tonearm might not be very obvious at first sight. This is what I perceived until I spent enough time to try out its features and make good use of them to calibrate the tonearm settings. I was amazed by its ability to extract subtle details from the records. Also, Axiom was able to deliver the whole dynamic range so effortlessly. As Axiom is so revealing and direct, I was tempted to revisit my collection of top records one by one and truly appreciate their values. You might find this tonearm very expensive. However, the bigger your vinyl records collection, the more value this tonearm could deliver. Especially if you own the first press of the records that are desperately sought by audiophiles, play it using Axiom and Aiwon. You will find the sound so pure and direct. The level of satisfaction simply cannot be valued by money since it reveals the priceless artistic value of human legacy. For this reason, I have become a proud owner of Axiom and Aiwon. 🎵