# Acoustical Systems

## Palladian

### A moving coil cartridge that serves like a time machine

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**Although vinyl playback system was an invention in the last century, there have been quite a number of manufacturers working very hard to improve the technologies used in turntable, tonearm and phono amplifier. Cartridge, being a crucial component in the system, is of no exception. We have seen some novel designs and innovations (such as the use of light sensor) over the past years. Even those which adopt conventional designs are also seen making significant breakthroughs in the use of superior materials, design and build quality. As such, audiophiles are more able to get closer to the finest music details hidden in the groove of vinyl records than before.**

Acoustical systems, a german manufacturer that earned high reputation on the market with their Smartractor (a phono alignment tool) and Axiom (tonearm), offered three moving coil cartridges in their product range, namely "Archon", "Astron" (special version of "Archon") and the flagship "Aiwon". In High End Munich 2016 show, the founder of the company, Dietrich Brakemeier, showed me his latest development - the new "Palladian" moving coil cartridge. His design is based on the "Aiwon" cartridge developed in 2014. He spent one and half year seeking to improve head shell material, coil and moving mass. At that time, I was a happy user of the "Archon" cartridge and thinking of upgrading to the flagship "Aiwon". When Dietrich introduced "Palladian" to me, my first question on top of my head was: Is Palladian going to replace Aiwon as the new flagship cartridge of Acoustical systems?

## Strategic Upgrade

Dietrich's answer was very interesting. He told me he was hoping to develop a new cartridge with different timbres out of the basic design used in Aiwon. In terms of sonic performance, Dietrich expected that Palladian and Aiwon would theoretically be in the same class. But he was wrong! It was a surprise even to the designer. Palladian turns out to be sonically much more superior to Aiwon. It also demonstrates much better dynamic. The music is much more lively than any other cartridge he developed.

There is a Chinese saying, "When you sell flowers, you will definitely praise the flower's smell." Likewise, I will not be completely convinced until I have a chance to listen to Palladian, even though I know that Dietrich is a talented and knowledgeable analogue designer and I certainly trust his professionalism.

Once Palladian became available, I was bold enough to order one piece from Dietrich without having listened to it, and believe it or not I was actually the first owner of this cartridge in Hong Kong. You might think I was too brave or had too much money to spend. But let me tell you, it was an informed decision based on my previous experience with the designer's products and the design philosophy he demonstrated. Most importantly, I was deeply impressed by Archon's performance in my home system. I must admit that pairing Palladian with my reference tonearm "Axiom" in my home system is a strategic decision. I want only the best cartridge to couple with the best tonearm I own. My decision is proved to be right. With Palladian and Axiom as the magical combination, the music was more lively and vivid than I have experienced ever.

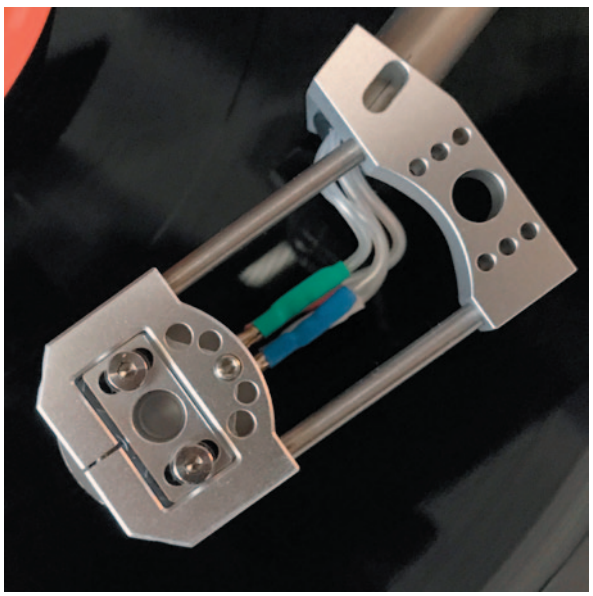
## Smart use of Titanium alloy

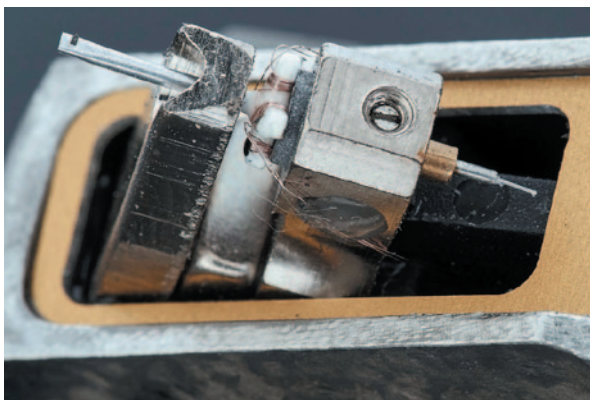
One of the reasons I picked Palladian is that, Palladian adopted Timet 1100, a type of medical grade titanium alloy, for making the cartridge body, same as that used in Aiwon. Titanium alloy is my favourite as it does not significantly colorise sound. It is probably more neutral than wood. Also, titanium alloy has many characteristics that make it ideal material for making cartridge.

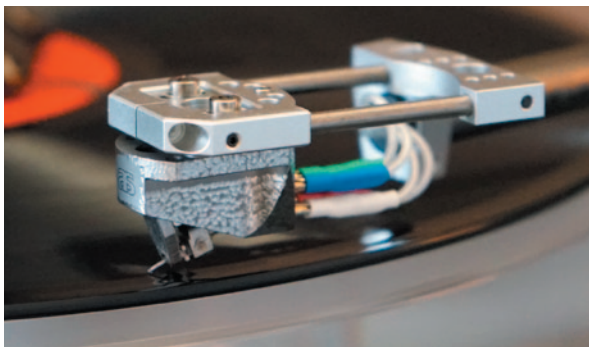
Titanium alloy is very light but very strong. It is 50% lighter than steel and merely 100% heavier than aluminium. It allows fast transmission of vibration. Vibration from stylus can be transmitted quickly to the tonearm, which is conducive to the accuracy of the signal pickup. Titanium alloy is non-magnetic. It does not get magnetised in any strong magnetic field, which is critical for the moving coil cartridge.


Reference System

■ Loudspeakers：Wilson Audio Alexia（Speaker Cable：Siltech Prince）■ Vinyl System：JR Transrotor Tourbillon turntable、Acoustical Systems Axiom tonearm、Accoustical Systems Palladian Cartridge、Acoustical Systems Aquilar tonearm、Kondo IO-M Cartridge ■ Phono amplifier：Kondo KSL-M7 Phono（Power Cable：Kondo Avocado）■ Moving Coil Cartridge Transformer：Kondo SFz（Ls-41 Version）■ Power Amplifier：Accuphase A-200（Power Cable：Shunyata Zi-Tron Sigma HC）■ Preamplifier：Kondo G1000（Power Cable：Kondo Avocado）■ Ground Box：Tripoint Audio Troy（Ground Wire：Tripoint Silver Ground Wire）■ K-01X → Kondo M1000 Mk II Interconnect：Siltech Royal Signature Princess G7 ■ Kondo M1000 Mk II → A-200 Interconnect：Siltech Royal Signature Princess G7





Titanium is typically not used alone. Aluminium and vanadium are usually added to make the metal stronger. The titanium alloy used in Palladian contains 6% aluminium, 4% zirconium, 2.7% tin and small amount of silicon and molybdenum.

The body of Palladian has uneven surfaces as it underwent hammering. The purpose is to eliminate flat parallel surface that contributes to resonance. The coil is made of 5N pure silver. The cartridge output is 0.33V, which is reasonably high if we speak of moving coil cartridge. Dietrich recommends 1.7g for the vertical tracking force (VTF) as it would make sure the coil is the middle of the magnetic field.

To improve the dynamic of Palladian, the designer shortened the cantilever on purpose. The material of the cantilever is identical to those used in all the other cartridges produced by the same manufacturer. It is tempered aluminium coated with C37 lacquer. C37 lacquer is arguably one of the most popular tools to shift resonance of the system to certain frequency ranges. By applying C37 lacquer onto the stylus, the resonance points will be altered. Apparently, Dietrich preferred using C37 lacquer to other tricks like using boron, diamond or ruby.

Palladian's stylus adopts Q4 Shibata Evo Profile, which is super elliptical. This profile was invented for quadraphonic LP records. It is sharper than regular elliptical profile, thus having a larger contact area with groove wall of vinyl record. It is able to pick up audio signal as high as 45kHz. Although there is no such need to pick up signal as high as this frequency in the monophonic or stereophonic LPs we found today, super elliptical profile is conducive of picking up signal of high frequency and reproducing micro-dynamic, which is in line with the designer's objectives.

## Somewhere in time

Mounting Palladian onto Axiom is very straightforward. It's not because both of them come from the same manufacturer. Instead, there are three circles on mounting side of Palladian, with one of those sharing the same shape and same diameter as the circular hole in Axiom's head shell. I merely need to position the cartridge so that both circles exactly overlaps and I'm ready to perform the next step of calibration. It took me less than 15 minutes to complete the entire installation process. I ensured that VTF reads 1.7g and the arm wand was in parallel with the surface of the record. I used 92° for the SRA.

It's worthwhile to say that I used two pieces of titanium alloy screws to mount Palladian onto Axiom. Titanium alloy screws sound more vivid, lively and transparent than brass, aluminium or steel. The ones I used are from Acoustical Systems. Dietrich told me they are medical grade titanium screws that are very limited in supply. I also used titanium screws from other manufacturers and not surprisingly, they all sound different.

The very first LP I used for auditioning Palladian is "Belafonte at Carnegie Hall" which is a 1959 live recording produced by RCA Victor. I have a shaded dog copy (i.e., first print) and it's one of my favourites. Palladian's advantage was very obvious when playing this record. Harry Belafonte's voice was extremely clear. The acoustical images had the right size with sharp and fine outlines. I could

effortlessly feel the hall ambience and the emotions of the audience. I also felt I was being part of them, interacting with Belafonte and the others. I enjoyed particularly the last song "Matilda" which brought the concert to the climax. The reality created by Palladian enable me to travel back to 1959!

At that time, I couldn't wait sharing my feedbacks with Dietrich. Here is what I wrote.

With Palladian, the music becomes extremely direct and dynamic. The sound image is very definitive and vivid. The playback is so close to live performance with a strong sense of me being surrounded by the reverb of the concert hall.

Afterwards, Dietrich replied with feedbacks he got from one of his Belgian reviewers:

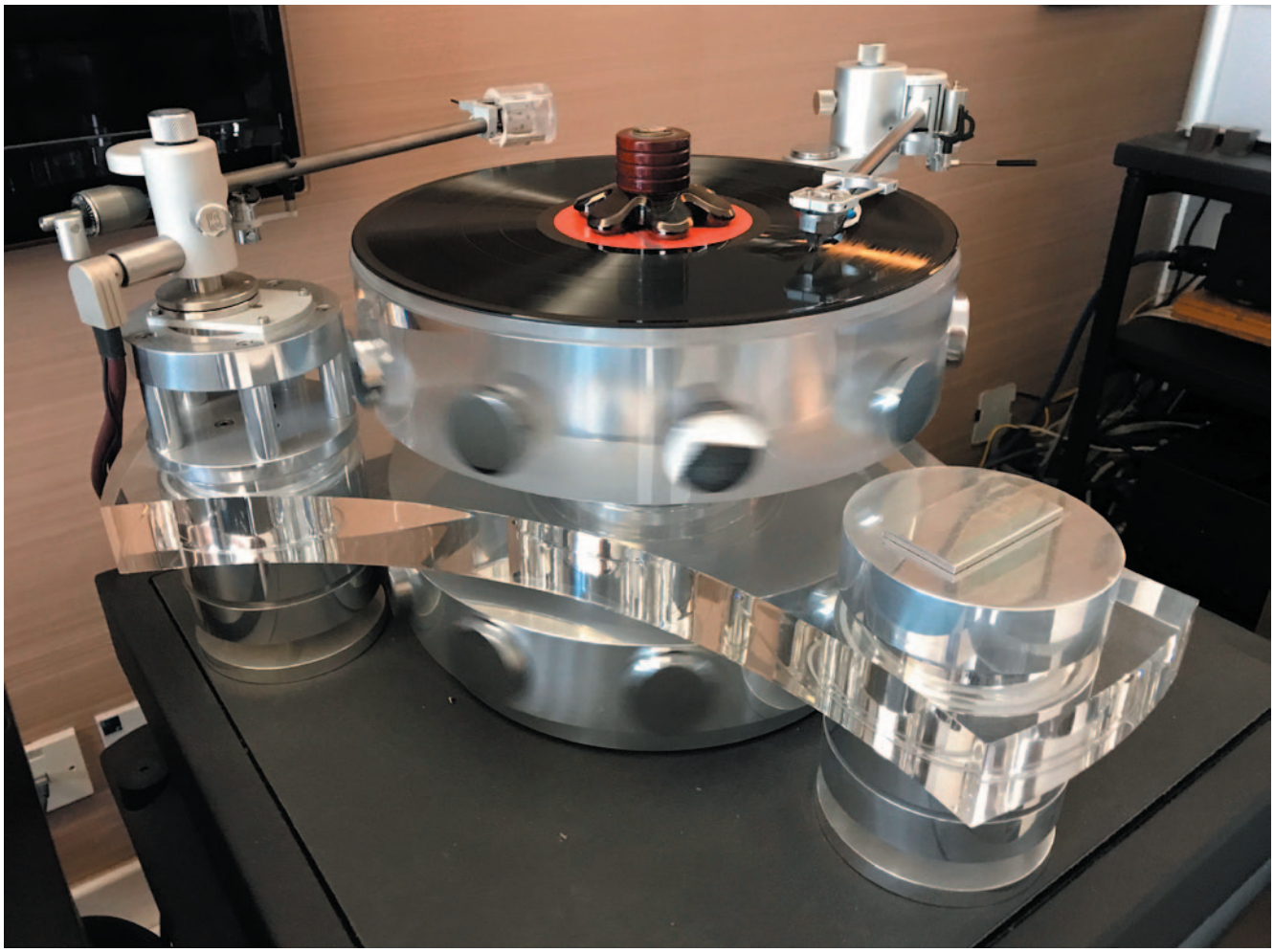
The new Palladian is now my reference cartridge, on the first listen: the music is there, we are transported to the concert hall and we forget to listen to the sound, we only hear the music. Afterwards, after a couple of days, we can make a real analysis of the cartridge, and I can confirm you that it has fantastic performance, and after comparing it to the Aiwon, I have to admit that the Palladian is on another level.

The dynamics and micro-dynamics, the reality and the timbre are amazing! It has a fantastic rhythm and you have the urge to start dancing. You have the feeling that the singer is in front of you, and that gives you chicken skin, goosebumps !

I wouldn't say "Great mind thinks alike" because of these comments but Palladian's merits are extremely apparent. Without any A/B listening test, anyone who tried the cartridge alone would make similar comments.

## Rational violin sound

Many cartridge designers used materials such as wood, jade, metal or exotic materials for building the cartridge body. Most of them attempted to achieve different timbres via these materials. However beautiful the sound they have achieved, there is no such thing are "the best timbre" or the most beautiful sound. There is only timbre one like most. Having said that, there are indeed timbres which are more popular among audiophiles than the others. I would categorise the timbre of Palladian's sound as the type that is easily loved by those who want to listen to something extremely natural and more importantly don't like artificial sweetness. There are cartridges that make female voice so sweet (and tempting) that most listeners would find tempting and smooth. Palladian is definitely not belonging to this category. It doesn't beautify sound. It neither exaggerates the positive nor hides the negative. With little coloration, Palladian's voice is nothing short of attractive. With high definition, I can discover a lot of subtle details and micro-dynamic that were not previously noticed. Don't underestimate these details and micro-dynamic - they are essential to unleash the beauty of the music in an authentic manner.



I played the double LPs of Hilary Hahn which contains 27 pieces of newly composed violin encores (DG 00289-479-6664) to experience Palladian's violin sound. Although the music in these LPs are not of the typical "easy listening" type, it is however one of best recordings recently released, not to mention that it received a Grammy award for the "Best Chamber Music/Small Ensemble Performance". What's so amazing about Palladian when playing this LP, the texture of the strings and the resonance of the violin body were so real and detailed. The piano sounded particularly transparent. Perhaps because all the works are contemporary, the pitch range covered by the piano was very wide. This imposed big challenges to the system as piano sound contains a substantial amount of overtones and dissonances, particularly in the lower pitch. Only if a system is able to recover these subtleties from the vinyl groves, the piano will sound like a real piano. Palladian is able to achieve this. And not many cartridges I heard before were able to achieve this level of realism. Besides, I found that Palladian's sound, especially at higher pitch, is very vibrant. The slightest difference in the loudness of each note played by the performer can be noticed without any effort. This essentially echoes how well the micro-dynamic that Palladian can reproduce.

## A great cartridge for large scale orchestral music

If you ask me what would be the genre that Palladian is best for, I won't hesitate to tell you that it is extremely good for playing large scale orchestra music. As I said, it is distinguished in producing deep and wide soundstage with extremely strong sense of instrument presence in each part of the orchestra. In the quiet passage, Palladian's music is so airy and touching that can hardly depicted by words. Just as I played large scale orchstral passages like Mahler's Symphony no. 2 (Decca SXL-6744-5 Pro-Ject reissue), Palladian is totally unconstrained. There seems to be no limit how Palladian responds to extreme dynamic. The most impressive part is that the weak details co-exist peacefully with the powerful sound in the music. They don't interfere each other. I would attribute this phenomenon to the use of titanium alloy which brings vibration from the stylus to the tonearm so fast that excessive energy gets dissipated quickly enough to avoid pollution.

## Conclusion

Palladian is by far my most favourite cartridge. It is like a time machine that brings me back to the recording venue and the whole performance is so real and convincing. The soundstage is wider and deeper than all the cartridges that I have used in my system before. The sense of space also greatly contributes to the realism of the analog playback. I was like sitting in the middle of a concert hall listening to the historical performances.

Palladian barely adds colour to the music. The sound of instruments are faithfully reproduced and extremely close to what I heard in real life. When playing human voices, the well-balanced frequency response makes the cartridge very ideal for reproducing the original timbre. Don't expect Palladian to sweeten any sound. It does not make music more comfortable. However, it makes music as close as how it was recorded. Along with the fine details and micro-dynamic. the music becomes very emotional, thus making it one of the best choices for playing human voices. 音