

An unrivaled beast

Wadax

Atlantis Reference DAC

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Since I bought my first CD player, Yamaha CD-X1, in 1983, the digital sources that I have been using at home have been either CD players or SACD/CD players. As digital audio system design and manufacturing technologies have improved significantly over time, the general impression among audiophiles over digital sound being dry, cold and harsh no longer prevails. Even a CD player under HKD10,000 has very decent sound.

Some hi-end manufacturers adopted various approaches to improve performance of their products in key aspects such as laser pickup, DAC circuit, digital clock, upsampler, power supply and mechanical structure of chassis. It is now commonplace to see many CD players have split design. The number of chassis has increased. The sound has become more and more detailed, pleasant to hear and more musical than ever. Even the hard-core fans of analog systems who used to be indifferent to digital audio are impressed by the development and showed a lot of interest in it. Over the past decades, I have listened to flagship CD / SACD playback systems from major brands in Japan, France, United States, Switzerland and UK. Every time I was extremely astonished as the performance overturned my cognition of what acoustical performance that CD playback could possibly achieve. There is no such thing as the best, only the better! However, I'm getting more and more curious - how would the ultimate CD playback sound like? Even though these systems usually cost a fortune, I never hesitate to replace the digital sources in Audiotechnique as well as those in my own den every time when I encountered with a better option. Every of these upgrades yielded very good results. Not to mention how satisfied I am after the upgrade in my own system. Besides, every upgrade in Audiotechnique benefit everybody especially our contributors, as better reference sources make it easier for them to test new products in the setup.

Personal Escort

In recent years, when digital music files and network streaming have become more popular, and the quality of playback has reached an unprecedented level welcome by even the most demanding audiophiles, the digital audio market has begun to change. New releases of CD players have started slowing down significantly. Even the manufacturers themselves were skeptical about the availability of potential headroom of growth. Audiophiles often asked, how much sound improvement can one bring in with a new digital audio source? How many manufacturers are still willing to invest in R & D in this area? That's why I found it a surprise when I saw some impressive new products from a Spanish manufacturer, Wadax, as there aren't many world renowned hi-fi manufacturers from Spain. The owner of Wadax, Javier Guadalajara, personally escorted and demonstrated the newly developed flagship DAC - Atlantis Reference DAC - with a price tag of US\$145,000 in Hong Kong for the world premiere, and a concert at the Divine Studio of Audio Exotics in mid-April 2019. Although these events were so crowded with audiophiles, I had the opportunity to sit in the best listening position to enjoy a lot of music I'm familiar, whether on CD or SACD. The sound performance is groundbreaking. With Wadax Atlantis CD/SACD transport, the amount of musical details in male and female voice, piano,



Atlantis Transport specifications

■ Compatible disc format: SACD, CD, DVD-Audio, Blu-ray PureAudio, CD-R/RW, DVD±R/RW, DVD±R DL, BR-R/RE ■ Dimension: 487 x 353 deep x 170 height (mm) ■ Weight: 32kg ■ Price: US\$69,000

Atlantis Reference DAC specifications

■ Digital input: USB(32bit/384kHz, DSD256, MQA) / 2 x SPDIF RCA, 2 x SPDIF BNC, 2 x AES/EBU(24bit/192kHz) / Wadax Link: 3 x AES. EBU, RJ45 ■ Output voltage: 1V / 2V / 4V ■ Output impedance: 0.15 Ω / 10 Ω / 50 Ω / 75 Ω / 600 Ω ■ Dimension: main unit 480 width x 435 depth x 265 height (mm) / power supply unit 181 width x 380 depth x 265 Height (mm) ■ Weight: 45kg for main unit / 18kg for power supply unit (per piece) ■ Price: US\$145,000

■ Distributor: Audio Exotic (852) 9181-8291



strings, rock music with strong rhythm, or even symphonies with very high dynamics was extremely rich. The analytical power revealed a lot of unheard details. The sound density is equally impressive. Not only was the frequency bandwidth extremely high, but the outlines of the acoustical images was super fine and vivid. Best of all, the system sounded extremely musical, which elevated the listeners to the heaven of music. Although Atlantis Reference DAC was just a prototype at that moment, its capability already surpassed all the CD playback systems I have ever heard. Also, I saw that many audiophiles who attended the demo were impressed by the stunning sound quality and their feedbacks were enthusiastically positive.

Perseverance

With its debut at the Munich Audio Show and the official mass production delivery to users in September, Atlantis Reference DAC began to spread in the audiophile community around the world. The overwhelming feedbacks from audiophiles added a lot of mysteries to this novel DAC (I was told that there were already 5 happy early birds in Hong Kong just after it was officially launched). Being good working partners, Javier and I have also long been good friends with a lot of common interests. For more than a year since the official launch, Javier has been persuading me to bring the Atlantis Transport + Atlantis Reference DAC back to my den for trial listening. He also “guaranteed” that I will get unprecedented music enjoyment from this ultimate digital source. To be honest, I have personally experienced their super DAC before. I have no doubt about its performance, but the problem is that I don’t have the suitable racks to accommodate it. The existing racks were bespoke Venture racks I bought many years ago. The heights of the solid wood pillars are 8 inches, 9 inches and 10 inches, while the height of the DAC which consists of a main unit and two separate power supply units is close to 10.5 inches (265mm). This is challenging to fit into my racks. Even though I usually couldn’t control myself in front of beautifully sounding equipment, the price of this Reference DAC is as high as 145,000 US dollars which will certainly put a lot of stress on my financial positions. At first, I was very reluctant to accept Javier’s proposal. However, as Javier was so perseverant and confident in his product, and I was indeed moved by this academically accomplished entrepreneur (with three degrees



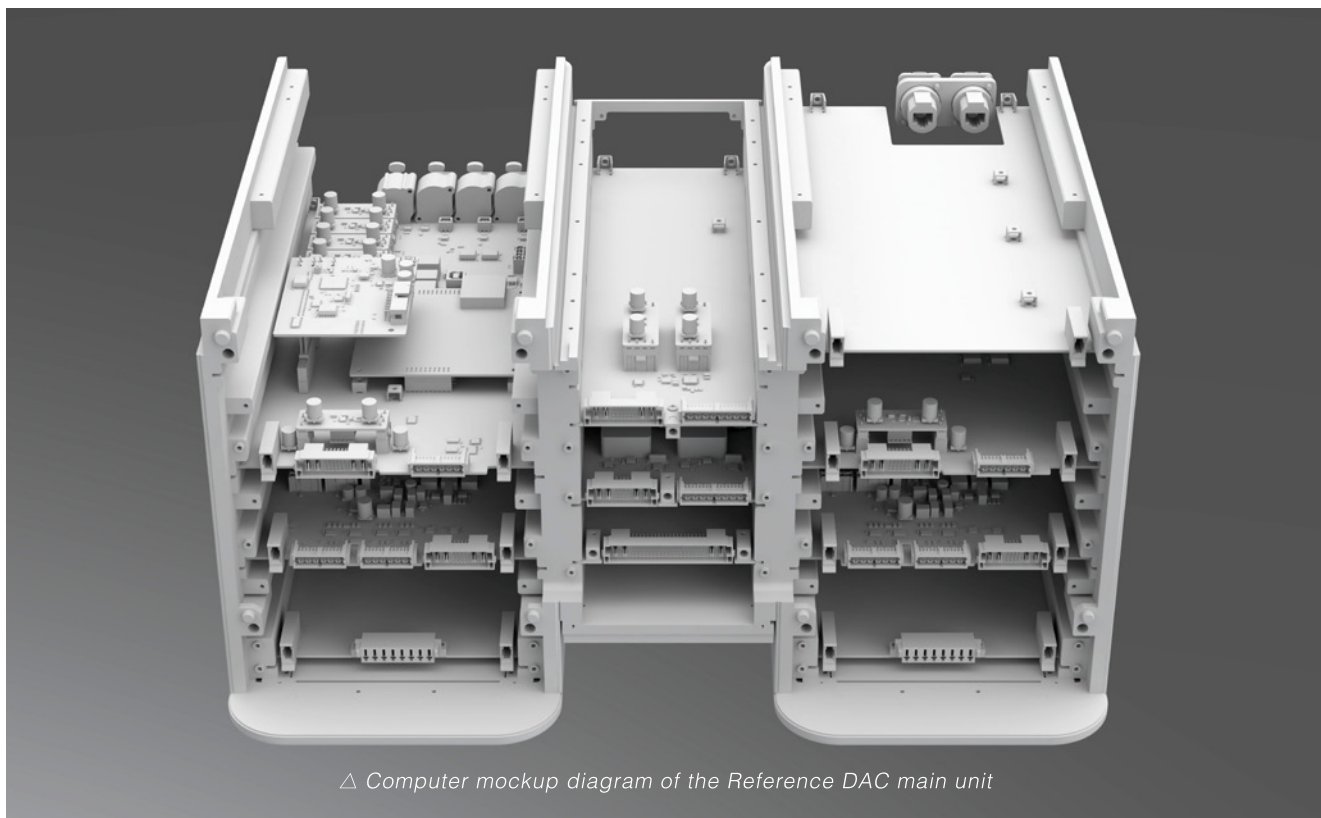
in electronics, communication and audio in university) who came up with a bright solution, I changed my mind. His solution is very simple - simply alter the length of the pillars of my audio rack. He knows of many carpenters with excellent craftsmanship in Spain. He can offer to make eight 290 mm solid wood pillars to replace the existing ones, and change one of my racks from four shelves to three shelves. Through this change, a complete set of Wadax transport and DAC can then be accommodated properly. I carefully considered his proposal and I agreed that it is the simplest solution. With this problem solved, my curiosity has defeated my sanity as usual. Interesting enough, it just so happens that I have a spare 8 inch pillar in hand. I decided to send it to Javier so that he could use it to replicate wooden pillars of the right length for me. This also means that I officially accepted his "risky" audition challenge.

The Ideal Principles

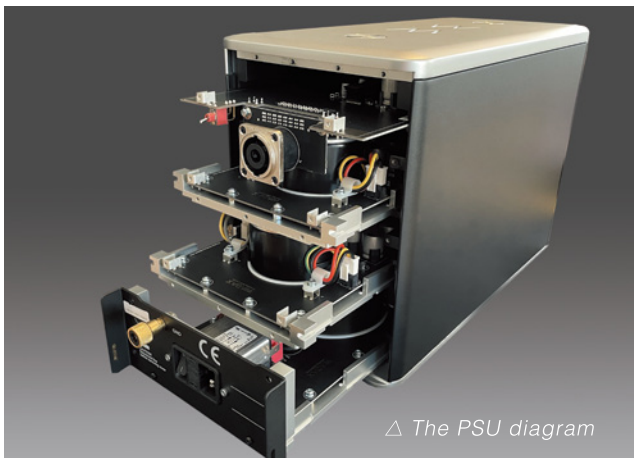
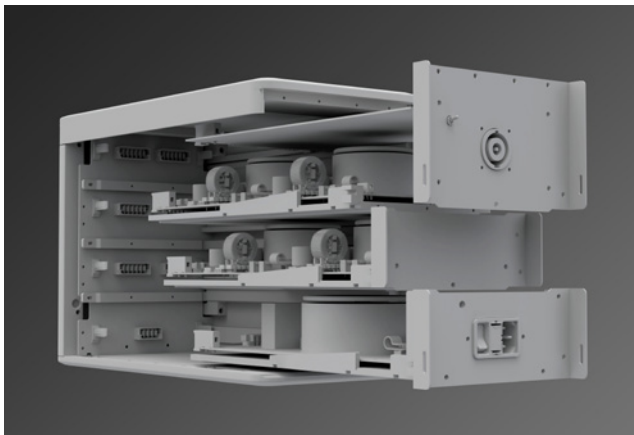
Given that I have made up my mind to audition this beast from Spain, it is perfect time for me to delve into the mystery of the beautiful sound of Reference DAC. Wadax is a High End audio brand established in 2010, specializing in the development of high-end digital audio equipment. Since the launch of independent Atlantis transport, DAC and server in 2017, with the excellent craftsmanship and excellent sound quality, they are getting famous in the high end audio market. Atlantis Reference DAC is the flagship DAC developed in 2019. Javier believes that an ideal DAC should have a very high signal-to-noise ratio and very low jitter. It should also cope with the format of all the popular digital sources in the market today and has the ability to upgrade to higher specifications in the future. It should have excellent power supply and can eliminate electromagnetic interference. The high-quality chassis structure

can eliminate resonance and mechanical interferences. The Reference DAC is developed based on these principles.

Basically Atlantis Reference DAC has a three-chassis split design. The main chassis is subdivided into three independent parts. The decoding circuits of the left and right channels are located in the left and right chassis, and the middle chassis accommodates the control circuits. The separate power supply units for the left and right channels have truly independent chassis (two power cables from the wall power must be connected, and two DC power cables are used to supply power to the main chassis). The chassis of the three components are made of aerospace-grade aluminum alloy with CNC. Due to the complexity of the circuit design, the main chassis is exceptionally large - 480mm(W) x 435mm(D) x 265mm(H). The weight is 45kg. The size of each power supply unit is 181mm (W) x 380mm(D) x 265mm(H). The weight is 18 kg. The structure of the three components is rock solid. Reference DAC is a fully balanced, dual-mono modular design which ensures that the digital circuit can be upgraded in the future. The left and right channels are completely independent mechanically and galvanically. The whole piece of equipment is equipped with 23 independent circuit boards and more than 5,500 discrete components. The power supply is made up by 10 specially wound transformers, 6-stage cascading voltage regulators, 5-stage DC voltage regulators and 30-stage active circuit regulators. The total noise level of the power supply is only 0.5 μ V (1Hz-100kHz), which is definitely an ultra-low figure. This ensures that the decoder circuit obtains a silent, pure and sufficient power supply. Javier said that the design crew spent more than 30,000 man-hours to develop the Reference DAC alone. Also, it normally took senior skilled technicians more than 100 man hours to assemble a complete DAC.



△ Computer mockup diagram of the Reference DAC main unit



△ The PSU diagram

The power of MusIC

In addition to the super heavy duty power supply, the digital/analog conversion circuit of the Reference DAC is also an ingenious design. As far as I know, it remains to be one of the most important secret sauce of Wadax. First of all, it has a fully balanced differential design. The positive and negative signals of the left and right channels are processed independently. In order to natively decode the input PCM and DSD digital streams (without any conversion), Javier picked the most advanced Delta-Sigma DAC chip from Texas Instruments, one for each channel. However, he uses only the chip's digital/analog conversion function but not remaining 90% of the functionality such as upsampling, DSP and volume control, etc.

Javier developed a chip called MusIC, which corrects distortion in music signals through its internal feed-forward process

in the time domain. The chip is manufactured by Panasonic Corporation exclusively for Wadax. What makes this chip so unique is that it does not only upsample PCM to 32bit/352.8kHz or 384kHz and DSD to DSD256, performs digital filtering and adjusts output voltage, it also uses Adaptive Delta Hibert Mapping to measure the input digital signal, and calculates the non-linear distortions due to jitter, noises from power supply, DAC, output stage after digital/analog conversion. Then, jitters and phase errors are corrected through the use of the inverted input signal.

Since the process requires very intensive computing power and transfer large volume of data (12.8GB per second), the chip uses a fixed-point operation with 128bit resolution to accurately complete the output processing and generate feed forward correction signal. Javier said that the improvement made by the MusIC processing circuit work not only measurable but also audible, which makes Reference DAC one of the most natural and musical DAC on the market. In fact, Javier have already developed the MusIC feed-forward correction processing circuit when he founded Wadax, and applied it in his first product, Pre One (pre-amplifier that integrates streaming, decoding and playback). Meanwhile, Reference DAC uses the latest and most advanced version of musIC circuit.

Unparalleled Craftsmanship

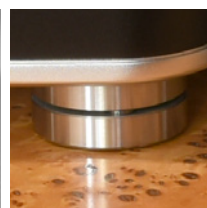
In October 2020, I received 12 pieces of long solid wooden pillars from Wadax. Just as Javier said, the materials and craftsmanship of the pillars are very outstanding. Even the color of the pillar resembles those in my rack. It's almost visually flawless to integrate the new pillars into my rack. Not long after then, I received a set of brand new Atlantis transport and Atlantis Reference DAC at my den. In a close encounter with this Wadax beast, I can personally feel Javier's ambition with this DAC. Just from the appearance, I can't imagine how much efforts the factory has put on the design the machine and how meticulously they manufacture the product. Of course,



△ The Reference DAC shipped to my den has already been engraved with my name, what does this imply?



△ Original stainless steel spikes



△ Finite Element Cerabase Slimline feet



△ Ayra Audio RevOpod feet

whether it is beautiful or not depends very much on one's personal taste, but the materials, the choice of colors, and polished surface and assembling techniques of the case are arguably the pinnacles of Wadax's production.

The centre of the front panel is occupied by a 5-inch circular full-color 800x480 touch screen. Just below that are there a row of 9 keys with indicators, which include 6 selectors of digital input, phase, mute and standby control keys. The layout of the back of the machine is also very organized. The digital input terminals include two sets of AES/EBU, two sets of SPDIF RCA and two sets of SPDIF BNC (up to 24bit/192kHz), one set of USB (up to 32bit/384kHz, DSD256 and MQA). There is also a native Reference Wadax Link dedicated to the Wadax Atlantis transport, including 3 AES/EBU to transmit the left and right channel digital streams and clock signals (the Reference DAC has a built-in Zepto Reference Clock with jitters down to only 12 femtosecond. It will be used as the master clock), and an RJ45 network cable for synchronization and control commands. In addition, there are service terminals for Wadax manufacturers to remotely test and upgrade the Reference DAC software through the Internet. The analog output includes only a set of balanced XLR terminals. Besides, there is a DC power input connector. The front panel of the power supply unit has got only one power indicator, and the back panel has a DC power output connector in addition to a IEC power socket. It also has a ground connection terminal, and a grounding / floating ground selector. The Wadax transport and decoder are equipped with large stainless steel feet made by the factory. After comparison, I decided to replace the feet of the transport with Ayra Audio RevOpod feet and those of the DAC with Finite Element Cerabase Slimline.

Superb listening experience

The combo can play optical discs of any format. Besides, Red Book CD (including MQA CD) and SACD (Native Direct Decoding PCM and DSD), it also plays Blu-ray Audio (but a display must be connected for one to select the playback functions in the on-screen menu. Blu-ray Video is also supported but only down-mixed two-channel sound can be played). The Reference DAC has adjustable output voltages of 1V, 2V and 4V. The output impedance can also be selected from 0.15 Ω , 10 Ω , 50 Ω , 75 Ω and 600 Ω , which can match with virtually any amplifier. In my setup, 1V and 0.15 Ω are found to be the most optimal values.

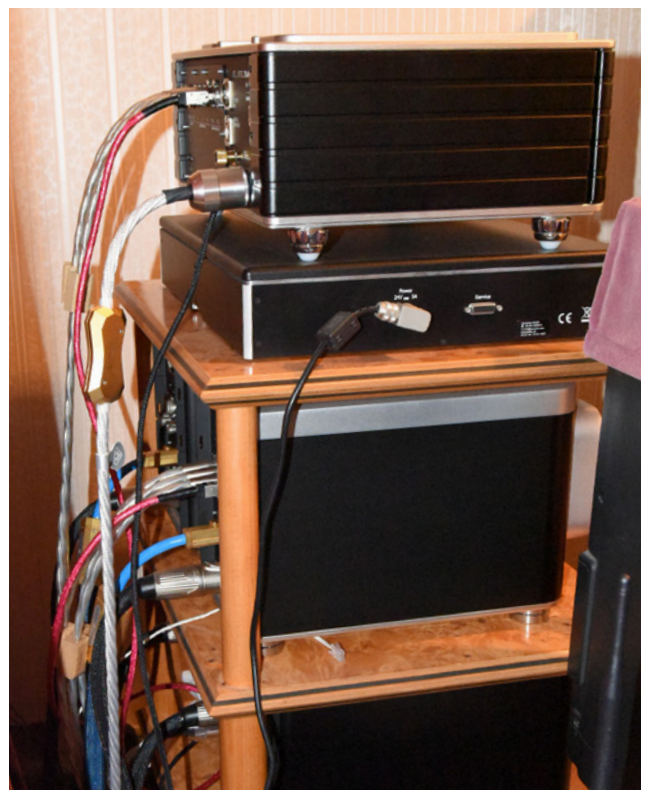
Other equipment currently in service at my den includes Audio Note M10 Signature preamplifier and Gaku-On mono power amplifier equipped with antique RCA211. The speakers are Akira from Tidal. The interconnect cables, speaker cables





and power cables of the power amplifiers are Siltech triple crowns. The power cord for preamplifier is Audio Note Sootto. The power cord of Atlantis turntable and Reference DAC is CrystalConnect Da Vinci. The three interconnects for AES/EBU are Nordost Odin 2. After 200 hours of continuous break-in, I started serious auditioning.

Without doubt, this combo of Wadax transport + DAC is the best digital audio source in terms of acoustical performance and sound quality that I have listened for decades as an audiophile and audio editor! First of all, its background noise is as silent as in deep ocean. You would not hear any trace of noises. Second, it has extraordinarily analytical power to reveal musical details. I played many records, especially old recordings, that I am very familiar with. But when I listened to it through Wadax, I discovered a lot more details that I have never noticed before, such as some subtle harmonics of musical instruments and vocals, micro-dynamics in voices and instruments, and the spatial projection of the recording venue. As a result, the sound is extremely realistic. As you probably know, I used to own many top-end CD systems from various brands and I could hardly find any shortcoming from these products. However, I still found Wadax's performance a surprise. In addition, Wadax's performance is all rounded. The high frequency appears to be boundless, crystal clear and very detailed. The middle is thick and rich, and the acoustical outlines are sharp and clear. The low frequency is deep with a strong sense of weight and textures. The sound stage is extremely deep, with very good separation between the instruments. The layering is very distinct and the sound image is exquisite and stable. Of course, the best part of this combo is the extreme smoothness and relaxing mood, as well as the expressive power of emotions. Every time when I played my favorite musics, I could not help indulge in the music and got deeply moved by it.



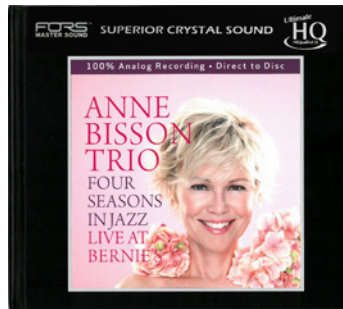
Realistic Interpretation



When I listened to classic album "Misty" from Three Blind Mice, the near-mic recording was amazingly realistic. I can feel vividly the subtle variation of pressure of the finger tips on the keyboard, whether the hammer hit the strings very softly or violently, dynamic of

string plucking in the double bass, vibration of the strings and rich harmonics from the hollow body, as well as slow swipe of the Jazz drums. At the end, what truly impressed me is the projected image of the three artists playing ecstatically in my head. I totally forgot whether the system is digital or analogue.

When listening to Anne Bisson Trio, Anne Bisson's vivid and brilliant jazz vocal expression and her sonorous piano playing, Pierre Tanguay's rhythmic jazz drums and Jean-Bertrand Carbou's dynamic, rich and deep sounding double bass



plucking were extremely realistic as if I were in the venue of live recording. You will deeply feel how attractive the musicians' deep musical senses and exquisite performance skills are. You will forget everything but the attractiveness and liveliness of the music, which I think is the secret sauce of the Wadax combo.

When I listened to the recent hit "John Williams in Vienna", it suddenly reminded me of a famous saying, "there is no such thing as the best sound, but only better sound". The impeccable performance of the Vienna Philharmonic Orchestra, the magnificent sound of their instruments, the calmness of John Williams, and the inexplicable excitement of the players under the baton of their idols, as well as the enthusiasm of the performance, and even the warm, natural and elegant ambience of the concert hall, the Wadax combo has done an absolutely fantastic job. This reminded me of the movies associated with the musics, and made me feel so relaxed, which is certainly a fulfilling experience !



Recap

Atlantis Reference DAC is equipped with Atlantis transport to replay CD and SACD, the sound is so beautiful and hardly resistible. Also, it is very difficult to find a rival on the market. You may say that, since I have not tried out Hi-res audio streaming function, I have not stretched the full potential of the DAC. However, I would say that the superb performance in CD/SACD playback is already worth the money. It goes without saying that I decided to own it and make it part of my home reference setup despite the high price tag.

At the time of writing, I was told that Atlantis Reference DAC had just won the 2020 Product Of The Year Award from the Absolute Sound Hi Fi magazine, which is well deserved I think ! 🎧