



TECHNICAL AUDIO DEVICES LABORATORIES, abbreviated as TAD, is a Japanese company founded in 2000. Its roots, however, date back to 1978, when a separate department was established in the Pioneer Electronics corporation to develop high-quality loudspeakers. The first TAD product was the Model One. In 2012, electronics joined the speakers - a preamplifier, power amplifier, SACD player and DAC. 」

HERE IS A LOT OF TALK about the so-called "trickling-down" of technical solution down the price list. The point is that a lot of money is invested in the development of a solution or technology, and then these solutions are used in the company's flagship products. They play the role of an "advertising medium" informing customers about the technical advancement of a given company. This advertisement aims to transfer the positive perception by customers to its entire lineup. When this mechanism works, the technologies in question are modified so that they can be used in cheaper products.



So much for the theory. In fact, most technically advanced solutions cannot be simplified. Hence, in press texts we find terms such as "inspired by ...", "using ..." etc. This means that these expensive ideas were only a distant inspiration and that technically these products have nothing to do with the bottom of the price list.

What is interesting about the TAD company, whose loudspeakers we test, is that when we look at the solutions used in the Evolution Two loudspeakers, we can see what the company had to sacrifice and what it managed to keep, and that they managed to keep way more. Because the TAD-E2 are the cheapest loudspeakers in their lineup, and yet they are very technically advanced.



I A few simple words...

SHINJI TARUTANI

CEO TAD Labs



Mr. SHINJI TARUTANI in TAD's listening room, next to the Reference One speakers
WOJCIECH PACUŁA Who designs speakers in your company?

SHINJI TARUTANI As a high-end brand, TAD emerged from the Pioneer Corporation, a company with a long tradition of speakers, founded in 1938. It has been built on a foundation laid by many engineer's continuous effort in materials development, new technologies, and production know-how (all emphasis ed.).

In other words, TAD's branding and technical direction do not require specific engineer's names. Also, as we want to be a brand with enduring activities, we do not think it is positive to highlight names of specific designers and engineers. Therefore, we would like to refrain from mentioning the designer's name.

WP What main solutions from previous models have you used in this one?

ST The 2.5cm Beryllium high frequency membrane is identical to the one used in the E1TX and ME1 models. The enclosure uses a structure called SILENT, which is a common technology for TAD's consumer loudspeakers.

WP What new solutions or features have you used in this model?

ST Until now, TAD consumer products have been equipped with coaxial drivers, which we call CST. The main reasons for using CST are

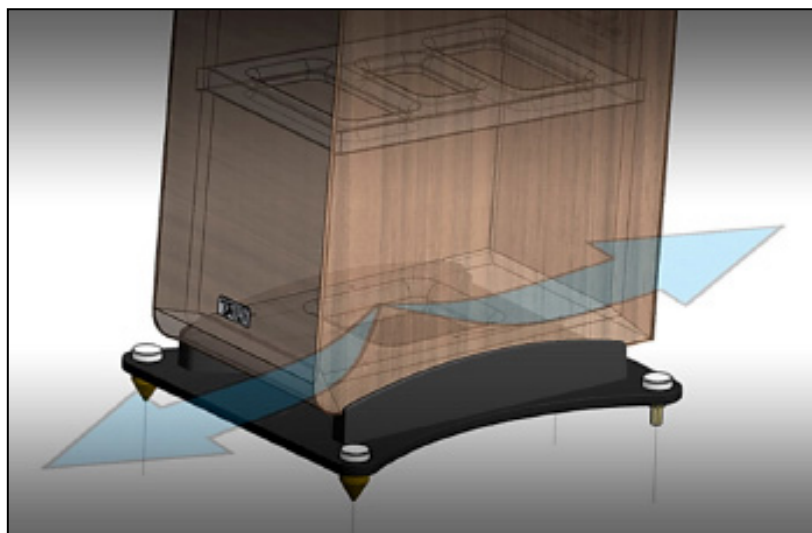
- The sound source can be made smaller.
- The directivity is controlled over a wide bandwidth.

These factors enable accurate localization of the sound image and control of the sound field to correctly reproduce spatial information in a compact size.

The new product, TAD-E2, introduces a more basic 2.5-way configuration of woofer and tweeter. The following points have been newly developed to provide smooth directivity control over the entire frequency range while using a 2.5-way configuration:

- Newly designed wave-guide for more active control of tweeter directivity.
- The woofer, which has a wider bandwidth, uses a cone shape that combines ideal directivity

and high-frequency damping characteristics, and a delta brace structure that offsets the disadvantages of this shape and increases the strength of the vibration system. Furthermore, measures have been taken to improve the distortion characteristics over a wide bandwidth.



WP How does the designing process look like - what comes first, listening or measuring?

ST We listen to what people expect from TAD, and then we put it into our product development road-map. We then decide on the product concept and sound concept, and select the elemental technologies that will realize these concepts (concept chart E2, PDF-document, page 9). We determine basic performance targets and conduct mechanism studies while utilizing simulations to finalize basic specifications.

Design elements can be broadly divided into the development and design of speaker units, the design and development of enclosures to mount them, and the design and development of crossover networks, input terminals, etc. At first, the specifications are refined through repeated prototyping and listening tests of the driver units. Then, the units are mounted in cabinets, and their individual frequency response, directivity, distortion characteristics, and time-domain characteristics are evaluated.

The individual data is used to simulate the overall characteristics of the speaker system. Prototypes of the speaker system are fabricated, auditioned with various types of music, and fine-tuned. Listening tests, simulations, and prototypes are repeated to further refine the product and raise its level of perfection.

As the name "Technical Audio Devices" suggests, TAD's product line emphasizes a technical approach based on theoretic study and precise experimentation. With that said, the results of listening tests have a great impact on the development process, too. While of course, we consider the physical characteristics of the speaker to be an important aspect of the product, the most important aspect is how much you are moved by the music you hear through the speakers.

WP What amplifiers and sources do you use in a system used for auditioning your speakers?

ST For development and listening tests we of course use our own electronics, but also various models from other manufacturers. We also use a very wide range of music for listening:

- for vocal music, we use Jazz, Pops, Blues, Gospel, Opera, etc,
- for classical music, we use a full range of music sources; classical music includes full orchestra, small chamber music, piano, violin, etc,
- for Jazz we use older recordings as well as new recordings.

Our goal is contained in the slogan: "The Artist's Intent, Intact".

WP What are your future plans?

ST In future, we will expand the line up to meet the expectations of as many music enthusiasts, as possible. As you very well know, the sound impression of speakers changes depending on the room, where you listen to them. Voicing in only one listening room may result in a biased sound quality, that includes the characteristics of the room. Therefore, TAD conducts listening tests in several different listening rooms.

TOHOKU PIONEER, , TAD's speaker development and production base, has four anechoic rooms and four studios. In addition, Pioneer's Kawagoe Plant, where amplifiers are developed and designed, also has a dedicated studio where speaker development is carried out while sharing sound quality confirmation with amplifier developers. **ST**



■ Evolution Two

EVOLUTION TWO by the Technical Audio Devices, which this Japanese company also calls TAD-E2, are its latest designs, launched last year, also available outside of Japan from April this year. They belong to the Evolution series, in which TAD offers solutions developed for the Reference series, but at a lower price point.

The TAD-E2 are slim, nice-looking and well-made floor-standing loudspeakers. Thanks to the narrow front (320 mm), their height (1085 mm) and depth (405 mm) are not overwhelming. The loudspeakers are a two-and-a-half-way bass-reflex design. The treble range is reproduced by a dome tweeter with a diameter of 25 mm, placed in a wave-guide. The rest of the bandwidth is entrusted to two mid-woofers with a diameter of 155 each. The division between the latter was set at 90 Hz. TAD is one of the few companies in the world that builds its own drivers. The loudspeakers have quite good efficiency and an amplifier-friendly impedance of 6 Ω , dropping only to 4.5 Ω at the lowest point.

In their design a particular attention was placed to the materials used to built speakers. The 25mm dome features a beryllium diaphragm and is connected to an aluminum wave-guide. The 155 mm drivers use composite diaphragms made of braided aramid fibers and cellulose. The integration with the room is to be helped by a specially designed bass-reflex port with two outlets - on the front and rear. The outlets are in the form of slots and are located between the cabinet and its base. The base is made of steel and connects to the cabinet through a layer of resin to minimize vibrations. Three large spikes are screwed into the base.

The cabinet is finished with natural veneer and its front edges - top and bottom - are rounded. It is made in a technique called by the company SILENT. The point is that the side panels are made of two different materials: plywood and MDF. It is internally reinforced in many places with rims that minimize its vibrations.

The loudspeakers look very serious, although they do not seem bulky, they even have “light” proportions. A narrow front baffle and a body inclined towards the back help in this effect. We will find many brand’s top solutions, although there is no coaxial CST system. It is an example of a great engineering.

SOUND

HOW WE LISTENED Unlike other TAD loudspeakers we've tested, the EVOLUTION TWO does not feature a CST coaxial system, which frees us from positioning them so that it is at the level of the listener's ears and aimed directly at them.

The Japanese loudspeakers stood at a distance of 255 cm from the listening position and 243 cm from each other (counting from the mesh of the tweeter). They were 78 cm from the back wall, counting from their back wall, but during the test it turned out that they sound better when placed closer - at a distance of 50 cm.



I set the distance between the speakers and their leveling with the Bosch PLR 50 C device. More about setting up the speakers can be found in the Micro-tuning article. Loudspeakers setup, HIGH FIDELITY № 177, January 1st, 2019, [HIGHFIDELITY.pl](https://www.hifidelity.pl), accessed on: 10/05/2022.

More about the acoustics of the HF listening room in the article Room acoustics and how it works according to MARIUSZ ZIELMACHOWICZ, HIGH FIDELITY № 189, 1 stycznia 2020, [HIGHFIDELITY.pl](https://www.hifidelity.pl), accessed on: 12/07/2022.



In the test they were driven by the SOULUTION 710 power amplifier. As usual in the case of high-end loudspeakers, it is worth providing them with as much of clean, non-distorted power as possible. However, unlike the previously tested MICRO EVOLUTION ONE, they are much easier to drive, as their efficiency is set at 87 dB, and the nominal impedance is 6 Ω . During the test, the signal from the Soulution amplifier was sent using SILTECH TRIPLE CROWN speaker cables. The HARBETH M40.1 speakers served as the reference point, and the signal was provided by the SACD AYON AUDIO CD-35 HF player. I also used the Mytek Brooklyn Bridge file player.

[Recordings used for the test | a selection](#)

- 、Jazz&Vocal. Pure DSD Recordings, Stereo Sound SSRR4, „Stereo Sound Reference Records”, SACD/CD (2010).
- 、Nobu's Popular Selection, sel. Nobuyuki Fu, Stereo Sound SSRR5, „Stereo Sound Reference Records”, SACD/CD (2010).
- 、Fusion. Best Sound Selection, sel. Yoshiro Obara, Stereo Sound SSRR-12, „Stereo Sound Reference Records”, SACD/CD (2019).
- 、THE MODERN JAZZ QUARTET, Pyramid, Atlantic Records/Warner Music Japan WPCR-25125, „Atlantic 60th”, CD (1960/2006).
- 、JEAN-MICHEL JARRE, Electronica 2: The Heart of Noise, Columbia/Sony Music Japan SICP-30956, BSCD2 (2016).
- 、JANE BIRKIN/SERGE GAINSBURG, Jane Birkin/Serge Gainsbourg, Mercury France/Universal Music UICY-15041, SHM-CD (1969/2011).
- 、SALVATORE ACCARDO, The Best of Violin, Fonè Records/Master Music MMXR-24008, XRCD24 (2010/2021).

THE TAD SPEAKERS sound differently than a large part of the designs available on the market. This is because they don't embellish anything, they don't color it and they don't "charm" a listener. Immediately, as soon as I listened to a few songs from albums prepared by the "Stereo Sound" magazine: Jazz & Vocal. Pure DSD Recordings, Nobu's Popular Selection and Fusion. Best Sound Selection, the term "monitors" came to mind. Released on SACD discs with turquoise protective paint, they were also really well mastered.

It was clear that the recordings, for example, from Jazz & Vocal. Pure DSD Recordings, come from different studios, because the tracks recorded by Sony Music Shinanomachi Studio in Tokyo, like Body and Soul from the LEE KOONITZA album, and in Avatar Studios in New York, as in Beautiful Love on the This Window by EUGENE PAO CD sounded completely different. The first track had a slightly smaller "ambient", drier reverberation, while the second one showed beautifully a huge, wood-paneled studio in New York.



The "monitor-like" performance of the TAD loudspeakers also consisted in the fact that they did not colored the lower midrange. And this is something that will need to be taken into account when constructing the system around E2 - because they should be its center. These are loudspeakers that deliver bass in a rather economical way. There are a lot of stand-mount speakers on the market that will seem to be more firmly embedded in low frequencies and that will simply sound more massive, and therefore more impressive.

At first glance, the E2 sound like small stand-mount monitors. But when we listen to them for a moment, when we pay attention to the size of the sound stage, we change our minds. The precision and lack of coloration will remain with us, comparable to the best mini-monitors from the BBC brand, but we will get a much better built body of instruments, better marked sound layers and a better insight into the recording.

Generally, however, it is better to place the speakers in question closer to the back wall. A some more filling of the sound will be useful. But that's just a suggestion. Because, in fact, it's about precision. The E2 shows the sound in an extremely accurate way. Interestingly, I have never had the impression that they sounded too bright or dry, as it often happens with this type of presentation. The treble was almost silky and a bit warm with them - but this is what beryl sounds like in every application I have heard it in.

This is why the strong, really strongly presented cymbals from THE MODERN JAZZ QUARTET Pyramid, very easy to "overdo", sounded simply natural and vibrant with the TADs. The sonority is another aspect of the E2's sound that I would like to draw your attention to. It is an incredibly clean sound, but always full of content, never too dry or too lean. And this is why both the cymbals and the vibraphone in the above-mentioned recordings had such an excellent decay, such a quick attack.

Surprised, I listened to the aforementioned album "coming to life". Usually it is shown with a patina, something like a slight blurring of attack and dryness - the TAD speakers showed that this is not a problem of the recording. As if they recognized the signal better and converted it into a sound wave more precisely. This ability to combine precision with filling the treble extends to other types of music, because in a similar way I received recordings from the excellent JEAN-MICHEL JARRE album entitled Electronica 2: The Heart of Noise, released in Japan on BSCD2.

You need to get used to the sound of these speakers. Although they share the idea of sound with the more expensive models of this company, it takes time and listening to the presentation to fall in love with it. Most likely it will not be love at first „sight”. This is because we are used to the fact that part of the bass is colored and emphasized - both by the loudspeakers themselves and by their interaction with the room. Evolution Two do not have that, their bass is super-precise and ultra-tight. And this means that there are no distortions in their presentation, which we associate with "filling" and "mass", even though they are almost always distortions.

But let's listen to them in a good system, for example with a tube or saturated transistor amplifier, let's place them closer to the back wall, and we will see a different world. Both in terms of tonality and spatial presentation. Because these are loudspeakers that differentiate perfectly both, better than 99% of loudspeakers from other companies. Only BBC monitors can do something similar.

Anyway, that is why it will be easy to integrate subwoofer (s) with the E2 if we need it. Such a combination usually results, if the loudspeakers deliver a colored bass, that this range is inconsistent. There will be no problem with the tested speakers, provided that the subwoofer is fast enough. We will then get a larger volume of instruments, and the precise soundstage offered by these designs will widen and deepen - despite the fact that there is nothing missing in this respect.

Finally, two words about space. The tested loudspeakers show the sound sources in an accurate and clear way, in well-defined places. The first impression, however, is different - the "fabric" of space is spread wide around us, to such an extent that at the first moment I wanted to check the polarity of the speaker cables. As it turned out - unnecessarily. This is because the Japanese speakers have the ability to show the whole and the detail at the same time and it is this combination that at first may be a bit confusing. After the accommodation you will have the impression that you are in real space, moved there by E2.

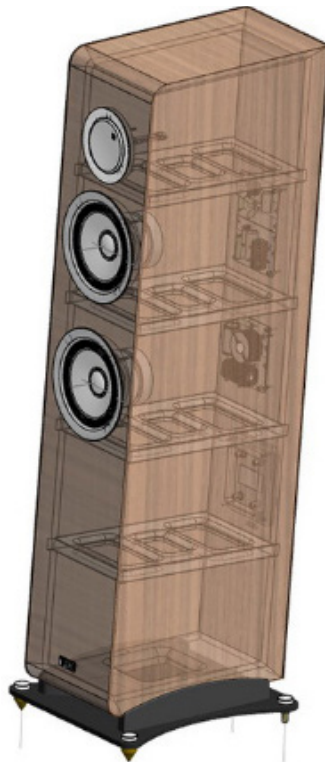
■ SUMMARY

EVOLUTION TWO BY TAD are loudspeakers delivering a sound that cannot be confused with any other. They resemble studio monitors, but with nicer, better saturated colors. They are equally dynamic, differentiating and resolving, but they add sweet high tones and sounds filled with information. Their tonal balance draws our attention to the midrange and its upper range, because there is no trace of coloration in their bass. It is worth adding some weight to it - with the setup, and this with electronics - but it is not necessary.

We will appreciate the purity of their tone both with electronics, as was the case with Jarre's album, with jazz, and with the classics. The unusual sound of the SALVATORE ACCARDO violin was with them clear, as rarely ever, and the album The Best of Violin, released on the XRCD24 disc by Mr. Kazuo Kiuchi, sounded just perfect. If this is what we are looking for in music, it will be difficult for me to absolve you if you do not listen to them.

DESIGN

DRIVERS The manufacturer of TAD-E2 is an "engineering" company, that is led by a selected engineering team, additionally equipped with excellent research and development facilities. No wonder that he uses proprietary hi-tech designs in his products. For example, the 25mm tweeter is made of beryllium. This is the same driver as found in the AD-E1TX and TAD-ME1 coaxial designs. A solution called HSDOM (Harmonized Synthetic Diaphragm Optimum Method) was used to model its dome, which is supposed to help clean presentation up to 60 kHz, without major resonances. The dome works with a wave-guide, specially developed for this model, made of aluminum. It has been an increasingly common method of tweeter loading in recent years to help control the directivity of wave propagation - see Monitor Audio and Paradigm. The mid-woofers have been specially developed for this model. They look different than the vast majority of loudspeakers available on the market, and this is due to the rigid suspension, known today from stage speakers and with high efficiency. Their diaphragms are called Multi-layered Aramid Composite Cone. They were made of two layers - the upper one, braided aramid fibers (trade name - Kevlar), and the lower one, made of high-quality paper pulp. They use an interesting solution related to the dust cap. Classically, it is simply glued in the center of the driver and attached directly to the diaphragm. In the TAD solution, the carcass on which the coil is wound extends quite high towards the cap. This one is not glued to the diaphragm, but to the aluminum "collar", and this one is attached to the carcass on one side and to the diaphragm on the other. This is to ensure greater rigidity and lower distortion.



Let me add that the drivers work in a two-way bass-reflex design, with the outlets in the shape of slots located between the cabinet and the base. The company called this solution Aero Dynamic Port. Let me add that you can attach magnetic round grilles to the two larger drivers; the tweeter is protected by a metal mesh.

、 **CABINET** The housing of the TAD loudspeakers is similar to other constructions of this company. It is a laminate made of plywood and thick MDF, reinforced inside with rims. This design is called SILENT: Structurally Inert Laminated Enclosure Technology. The idea is that sound waves passing from one structure to another lose their energy in the form of heat.

The basis also plays a role in this age-old "war". It was laser cut from a 10mm steel plate and painted black. Three large spikes are screwed into it - one at the back and two at the front, as well as two spacers that allow the speaker to be safely tilted without fear that it will tip over. Resin is placed between the base and the cabinet, which additionally separates these two elements from each other.

On the back of the loudspeaker there are double, gold-plated, convenient to use speaker terminals, prepared for bi-wire connection. They are compact with short copper braid jumpers. ■



