

# audio**x**press

ADVANCING THE EVOLUTION OF AUDIO TECHNOLOGY

## Speaker FOCUS Edition!

Fresh From the Bench  
**SB Acoustics Rinjani  
and Ara Speaker Kits**

By Oliver A. Masciarotte

R&D Stories  
**True Bass in a Large Space  
A Pro DIY Subwoofer Project  
Using a 1975 EV 30" Woofer**

By Don Keele, Jr.

You Can DIY!  
**The Thinman Project**

By Ken Bird

You Can DIY!  
**A Hybrid Electrostatic Speaker  
with Tailored Dispersion**

By Charlie Mimbs

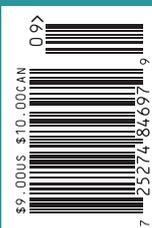


Questions & Answers  
With Zoltán Bay,  
Creator of the  
Bay Radial Speaker

Sound Control  
Acoustical Measurements  
on a Tight Budget



Fresh From the Bench  
**RME ADI-2 Pro Converter  
and Headphone Amplifier**  
By Bennett Prescott  
and Stuart Yaniger





# New Design Brings International Recognition

## An Interview with Zoltán Bay, Creator of the Bay Radial Speaker

By  
**Shannon Becker**  
(United States)

With 35 years of audio experience, Zoltán Bay has now reached a new level of audio recognition with his newly patented design called the Bay Radial Speaker. The design has catapulted him from the solitude of his Hungarian village of Tiszaalpár to the limelight at the Association of Loudspeaker Manufacturing and Acoustics (ALMA) International event in Las Vegas, NV. The loudspeaker driver developed by Bay has garnered praise for a good reason. It has enabled renowned musicians to relive their own performances and has generated a months-long waiting list of enthusiasts signed up for an audition. We recently asked Zoltán Bay about his past, present, and future.



Zoltán Bay has reached a new level of audio recognition with his newly patented Bay Radial Speaker (BRS).



Bay has developed a number of high-end speakers during his career. This is the Bayz full-range electrostatic loudspeaker.

**SHANNON:** Tell us about your background. How did you get into audio engineering?

**ZOLTÁN:** It was a family influence early on. My uncle was a world-famous physicist. He pioneered radar astronomy by measuring the Earth-Moon distance using a radio locator. We have him to credit with our currently approved standard definition of a meter, and he even participated in the Apollo 11 program. My father designed vacuum tubes, amplification systems for movie theaters, and microphones. I would often talk with him about his patents and various technical solutions. In the 1960s, he invented a top-notch dynamic microphone that was suitable for mass production and became widely used throughout the Eastern Block due to its famous reliability and superb sound quality. The BEAG MD 14 model microphone was a favorite among news reporters and correspondents, and was even fitted to buses.

Apart from this family inspiration, I have always been an avid music fan. Music has always played a

major role in my life. I learned to play the piano, and I practice regularly to this day. I was also interested in medical science, however, so I studied electronic medical instrument design at the university. My diploma project was a hi-fi amplifier, though.

I got this idea of a novel method for adjusting the bias of the output stage of a power amplifier. I had been taught that the bias of the output stage had to be fixed, but I thought other things were more important. Contrary to a widespread misconception, the chief characteristic of Class-A operation is not high-current biasing, but the fact that the output transistors never shut down during operation. I could not wrap my mind around the notion of why high current should be the only way to prevent the output transistors from shutting down during operation. I came up with a solution for preventing that from happening even as the bias current is kept at a low 30 mA. This so-called "sliding biasing circuit" then became the subject of my thesis and my first patent.

While I was studying amplifier topologies at the school library, I was approached by the science director of the college, Dr. Attila Pócza, the foremost amplifier designer in Hungary at the time, with decent qualifications. He wanted to see the professional journals I was reading and asked me about the project I was working on. I had been an instrumentation major while he was heading the Department of Telecommunications, so we had never met. At the end of our exchange, he offered to be my advisor if I chose this amplifier as my diploma project. He was the one who set me on a path based on engineering principles that are still considered cutting-edge in analog amplifier design, even though this happened 35 years ago. In the implementation phase, my amplifier design proved itself because of its unique specifications—using a small amount of feedback (20 dB) but with low distortion and an impressive slew rate (greater than 100 V/μS).

The amplifier I built was quite possibly one of the best amps of its day. It surpassed Matti Ojala's world-famous amplifier in terms of specs, and even beat it in subjective listening tests. I have always followed the principle of not walking a well-trodden path. If I had, I would not have been able to achieve more than others had already achieved. I have always wanted to transcend the prevailing state of the art. This ambition is all I have and all I follow. It is my life. And life is full of interesting turns, indeed. Dr. Pócza is now retired in Australia, racking up the hours listening to an audio system I designed. Over the years, I gained a lot of experience from subjective listening tests in addition to the inevitable measurements. I am convinced that, without this kind of experience,



it is impossible to design any audio equipment worth its salt.

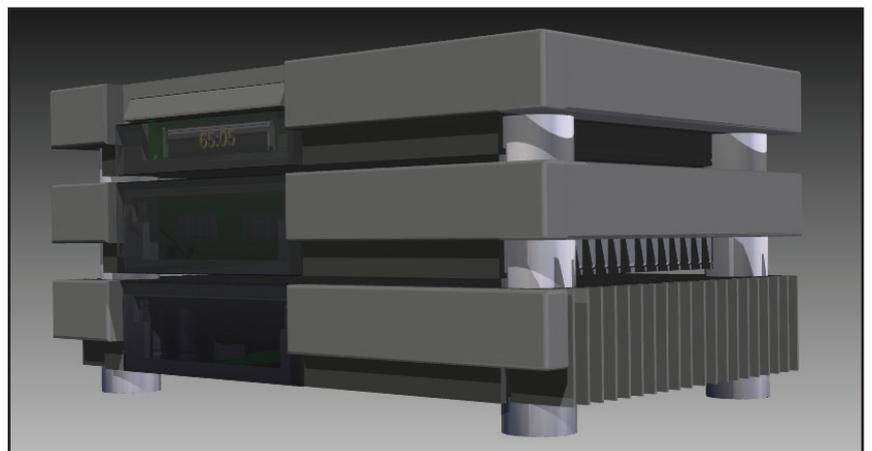
After college I spent some two years measuring vibration on various machinery and studying thick-film hybrid electronics. Meanwhile, I applied for and was granted a patent for a medical instrument. In tandem with a few teammates, I designed an instrument for dentistry for analyzing the dissolution of implants in vivo.

At the age of 27, I struck out on my own, devoting all my energy to engineering and manufacturing high-end equipment. I am 60 now. I have always worked alone, in hermit-like seclusion. I have never needed to advertise. My business is strictly word of mouth, and it has never failed to support my family. I live like a shoemaker who only makes bespoke shoes, and making a living doing it. I have never considered production lines. I am only interested in engineering and design.

Bayz cd player preamp adds another link in the audio component chain.

**SHANNON:** How did your products evolve over the years?

**ZOLTÁN:** I started out only making amplifiers, but when I tried to sell them I realized I could not afford



One of Zoltán Bay's audio system designs.



## Questions & Answers



The Bay Radial Speaker is actually a cylindrical membrane surface capable of changing its diameter.

to ignore other components in the chain. No matter how good my amps were, some orders fell through because the other links in the chain were so weak that they could not reveal the true strengths of those amplifiers. This drove me to design cables at first, then loudspeakers and media players, all to high-end standards. Once I had made a complete chain of my own, everything fell into place.

**SHANNON:** Tell us about your work process.

**ZOLTÁN:** I build equipment to order exclusively. I have never made more than two or three samples of the exact same concept. From industrial design to circuit boards to analysis I do everything myself, and I offer a lifetime warranty on everything

that leaves my workshop door. Starting in the 1980s, I realized the importance of computer-aided design and simulation, and I have devoted a lot of time and money to this aspect of the process.

By the time I finish a product, I know what I need to change to make the next one even better. The span of 35 years has been long enough to amass enough experience to always come up with a superior product.

**SHANNON:** Which of your products are you most proud?

**ZOLTÁN:** There are two. Each represents similar lofty standards of innovation (although the rest are nearly up there, too). One of them is my power amplifier. It has a number of solutions not employed by anybody else but, more importantly, its sound quality also benefits from a rigorous and self-consistent application of the theoretical knowledge I have accumulated over the years. When my friend Sven

Boenicke (of Boenicke Audio) auditioned this amplifier and he said, "It really did transform our speakers into new instruments—I could hear things from them I had never heard before from a speaker at all!"

The other one is the Bay Radial Speaker (BRS, [www.bayz-audio.eu](http://www.bayz-audio.eu)). I had been designing electrostatic panels, including a full-range one, which received a special technological award in the industrial design category, which is a very high distinction in Hungary. Then I began to entertain the notion of a driver that would radiate sound in all directions, around a 360° full circle. Now, this would be a major step forward in sound reproduction, I thought. It came naturally to first test this on the electrostatic principle. I succeeded in developing a radial driver, which reconfirmed that I was on the right track. In the end, however, the problems, logistics, and costs of an electrostatic design forced me to abandon this line of inquiry.

Then I began to think about ways to implement radiation in 360°, using a magnet and a coil in a dynamic loudspeaker system. I felt the idea had immense potential, so I put all my eggs in one basket. It took me eight years, but I think I managed to develop a revolutionary concept and a revolutionary step forward in sound. I applied for a patent in 2011, and I got it in the United States, Japan, EU, and China. The process in India is still underway.

**SHANNON:** Can you tell us more about the design of your BRS?

**ZOLTÁN:** The driver is entirely different from the dynamic dome, ribbon, and other magnetic designs known today. It is not a take on any of these tweeter paradigms. The membrane (radiating surface) itself is a vibrating cylinder with a variable diameter. This enables a large driver surface, up to 50 or 100 greater than the radiating area of a regular tweeter. This means that the energy transmitted to the driver space is far less concentrated, which makes for a much more relaxed and pleasant listening experience to the human ear.

The unorthodox design of the voice coil provides significantly improved ventilation and thus better power handling and lower inductivity compared with conventional solutions. In short, the driver behaves much less as a reactive load.

Under subjective listening tests, the driver delivers on all the sonic expectations, such as realistic imaging in precisely delineated space and a nearly holographic soundstage, with instruments far removed from the plane of the speakers when appropriate. It's the end of the head-in-a-vise syndrome. The stereo from



This is one of Bayz hand-crafted Chaconne power preamplifiers.

this speaker is completely immune to sideways movements of the head.

A surprise benefit of the 360° radiation pattern is its ability to preserve the attributes of stereo space even when the speaker is placed directly against the wall. It is common knowledge that the best speakers in the market today must be set up at least two or three feet out from the front wall in order to throw a spacious stereo field. Therefore, the suitability of the BRS to be used right against the wall makes it an excellent satellite speaker because it is not constrained by near-wall placement in its ability to portray an amazingly convincing soundstage.

**SHANNON: What kind of feedback have you received to the BRS?**

**ZOLTÁN:** Professor Ernő Sebestyén, the former head of the Violin Department of the Munich University of Music and Performing Arts, is a high-end freak. He has worked with some of the greatest music legends, including Leonard Bernstein, George Solti, Lorin Masel, as first violin, and concert master. He has bought several systems from me and once wrote in my guest book that he thought I made the best loudspeakers in the world. He said, "I had never heard sound reproduction so perfect before." The last time I held a demonstration in Munich, he invited his violin students to show them what this driver can do. They only had the highest praise when they commented on it in the guestbook. I met Ernő more than two years ago, and we have been in touch ever since. This is usually how it works with my customers.

The current president of ALMA International, Dan Foley, has visited me on two occasions. It started as a chance encounter. What happened was he sat next to a friend of mine on an airplane. They struck up a conversation. He talked about his line of business, and my friend told him about me and my patents. This piqued his curiosity, and he made an appointment with me to audition the BRS. Foley has been in the business for 31 years, but he told me he thought the BRS "tweeter is among the best I have ever heard and it may very well be the best in the world today." I am really grateful to him. It was his professional input that helped me make an appearance at the ALMA International event (AISE) in Las Vegas, NV, where he personally introduced me to the representatives of the trade.

This was how I got involved with a wonderful community. I made the acquaintance of several professionals of excellence, the "crème de la crème" of the trade, who helped me all along to make my demo a success. In addition to Foley, I must specifically mention Mark Beach and Bob Young, but everyone



Zoltán Bay showcases his Bay Radial Speaker at the High End Show in Munich this past May.

else was very welcoming and helpful. The event will remain in my mind as one of the finest memories I have ever had. The ALMA event was instrumental in fostering my ambition to sell manufacturing rights to my BRS. I am now in talks with several companies.

**SHANNON: Which skills do you think made the greatest contribution to your success?**

**ZOLTÁN:** I have 35 years of experience in the field behind my back, and this shows in both the design and the actual sound. I also have the ears to hear things you cannot measure with instruments. This is a talent which I have managed to hone into a skill. I never cease to seek radically new solutions and I have many fresh ideas. I simply enjoy challenging conventional wisdom.

**SHANNON: What are your plans for the future?**

**ZOLTÁN:** The ALMA event gave me great impetus. I had many inquiries about the BRS license, and talks are under way with several potential partners. I hope the BRS will find its way to many people and break new ground in serious music listening in the field. And I have several other exciting ideas on the back burner. I trust that more than one of them will be implemented and eventually become a mature product. 📧