PRODUCTION EXPERT
RSPE AUDIO SOLUTIONS

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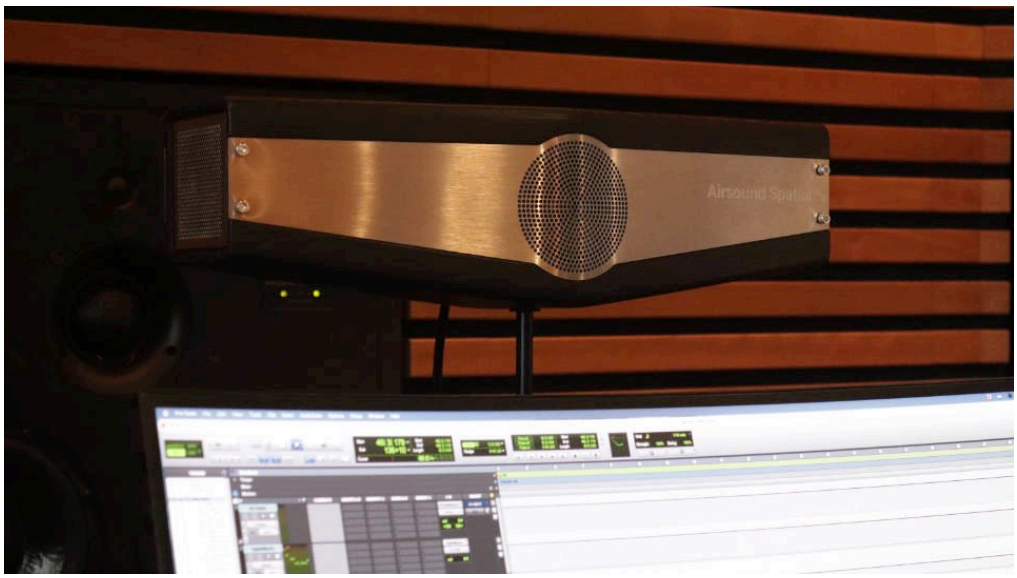
Posted by Julian Rodgers

Genuinely Innovative Speaker Technology Worth Checking Out



I spend a lot of time, probably more than I should, thinking about loudspeakers. While other gear-heads might spend time thinking about compressors, I think about transducers and it strikes me that unlike other areas of audio technology, transducers are largely stubbornly stuck in the 20th century. Leaving microphones to one side and concentrating on transduction in the other direction, studio monitors have remained largely unchanged since well before the turn of the century.

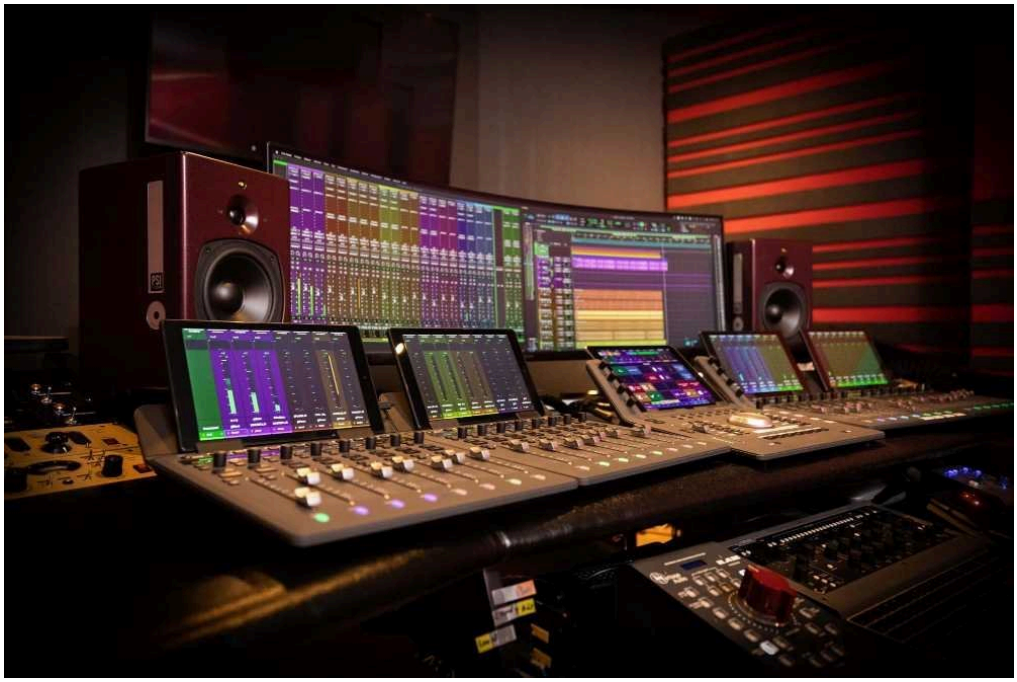
You might argue that physics hasn't changed so why would the approaches to turning electrical energy into acoustic energy? However, looking beyond the recording studio I'm struck by the number of genuinely innovative developments in other areas of

studios don't look very different to those of fifty years ago. They are better, but in the main they aren't very different.

Better And Cheaper

One thing which might go some way at least to understanding this is the downward pressures which exist on price. The Pro Audio industry has been transformed by computers, DAWs and the like in the last 30 years, but just as big a change has been the sharp and continuing contraction of budgets as streaming has impacted revenues. Much of the best monitoring is old technology done well. The biggest change we see is the results of DSP applied to what is fundamentally old technology.

The old approaches work. A PMC or ATC monitor is a beautiful thing. It uses approaches which have existed for decades and refines them. Incrementally improving them over decades. Computers assist in development and prototyping but they are fundamentally a continuation of what has gone before. But what about different approaches? What's new or original? I should make the point that 'new' is a word which has to be approached with some nuance because if you look hard enough you'll usually find that something 'new' is actually an old idea which for whatever reason hasn't yet come to prominence. But with that proviso here are some developments which are different to the typical approaches we find in studio monitoring.



PSI - Adaptive Output Impedance

DSP is used to do all sorts of useful things and although speaker calibration is the most sophisticated of these, there are many functions which can be achieved using purely analogue techniques. Complex filters and crossovers have been and continue to be realised in entirely analogue form but one feature which impressed me that it was 100% analogue was the Adaptive Output Impedance system used in PSI monitors.

People who have used passive monitors or Hi Fi probably appreciate the way speakers affect the amplifiers as well as amplifiers affecting speakers. When a loudspeaker's coil moves in response to a signal from an amplifier, the coil generates a back electromotive force (EMF) that resists the amplifier signal and acts as a 'brake' to stop the coil movement. This has been refined by PSI into a system which adjusts impedance to control diaphragm movement. As the speaker travels to its intended position the current flow is adjusted to reproduce the electrical input as accurately as possible, both by maximising current to accelerate the driver, then acting as an active brake to minimise

think contributed to what was a really eye opening experience. Active braking isn't new, for example the JBL LSR6328 uses a much simpler technique to provide what they call Dynamic Braking but the PSI system, together with its (all analogue) Compensated Phase Response system are something more sophisticated.

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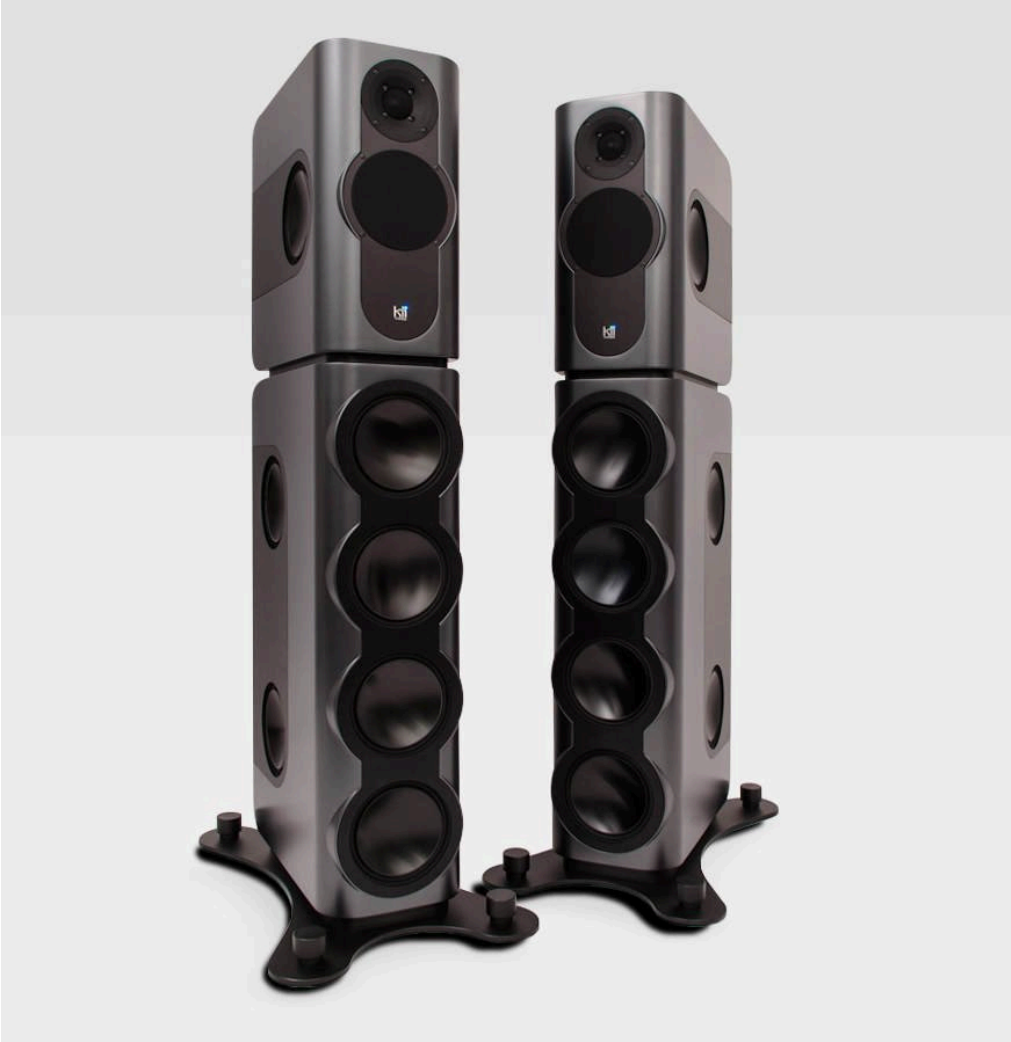


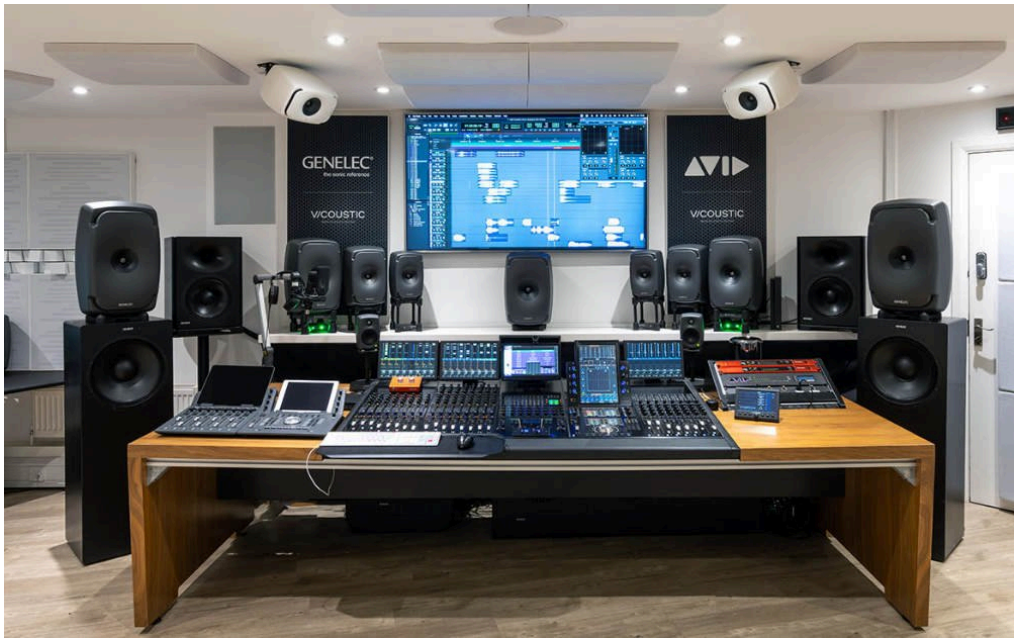
Kii BXT - Line Array Principles

In the mid nineties I was working for one of the first companies

the useful way a vertical array of speakers can, under the right conditions, couple to form a line source was always limited because it wasn't possible to couple multiple high frequency drivers together. This was solved by Dr Christian Heil of L'Acoustics with the creation of an ingenious waveguide leading to the familiar J-shaped hangs of PA we now see at festivals.

Line arrays have several benefits but have never been a feature of studio monitoring because the problems they solve aren't really relevant to studios, but I'd missed an implementation of line array principles in the Kii BXT bass extension system for Kii Three monitors.

I could easily namecheck the Kii Three itself as an example of doing something new in studio monitoring, it certainly qualifies. The use of DSP and multiple drivers to create a full range cardioid response is remarkable and certainly not something which was possible in the 20th century. The Kii Three also uses a version of the active control of speaker diaphragms referred to in the section above in its midrange driver, but instead I'll highlight how the BXT is more than the subwoofer extension option to the Kii Three I at first assumed it to be. The BXT together with the drivers in the Kii Three form a line array which controls the vertical dispersion of the bass and low midrange content from the system, keeping audio away from the ceiling and importantly the floor. In the same way as a desk reflection affects nearfield monitors, a floor reflection colours floorstanding products like the Kii Three/BXT system. When I auditioned the system I was expecting a bunch of extra bass and more headroom compared to just using a pair of Kii Threes. I got those but the effect of the BXT was more than that. Subtler and far classier than what a conventional subwoofer could add.



Genelec Experience Centre at Scrub in Soho, London

Genelec W371 - Woofer ‘System’

Another product which you could mistake for a subwoofer but is actually far more than that is the Genelec W371. This is a Woofer System (not a subwoofer). The W371A can reproduce sound from around 500Hz and below. It isn’t just a subwoofer with an extended frequency response. It looks like a tall plinth suitable for mounting a monitor on top, as it is designed to do when used with a pair of Genelec’s The Ones 8300 series SAM monitors. It has a driver mounted both at the top and at the bottom and by placing the drivers in different points in space, and enabling all the drivers in a system of multiple W371s all to act together in a single system sharing low frequency content, clever and useful things are possible.

The W371A is able to radiate low frequency information in a number of ways, depending on your room orientation, acoustics and preference. The first and default mode is named ‘Complementary Mode’ where the woofers operate independently from one another. The second mode, ‘Directive

used to reduce back wall, side wall or floor reflections.

This approach gives impressive results, as I discovered when I auditioned the whole SAM range at the Genelec Experience Centre at Scrub in Soho. The ability to have the monitoring system work together as a whole to alleviate what were previously intractable issues with room modes is every bit as clever as it sounds.

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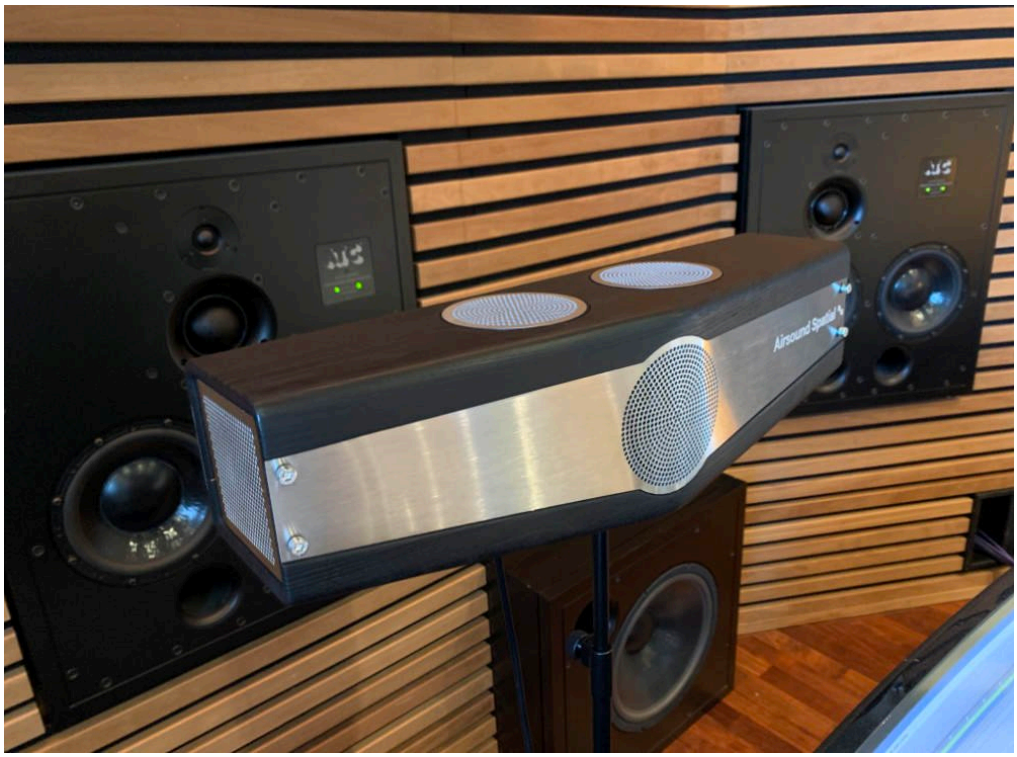

AirSound - Mid-Side Principles For Immersive

When I first heard about AirSound I was intrigued because it promised Immersive playback from just two speakers. A project driven by two brothers, speaker designer Daniel Fletcher and his brother Guy, keyboard player in Dire Straits. The AirSound system uses a combination of a software front end which

localisation.

There's a lot going on in this system but (very roughly) the operating principle of a single AirSound speaker can be likened to a Mid-Side mic array in reverse. A forward facing single driver (the cardioid 'mic') and a pair of sideways facing speakers acting together as a dipole (the fig 8 'mic'). The processing in the host computer which decides what audio goes where has a lot to do with the results but the basic principle is simple to understand. Link more than one together and you can get an immersive experience.

When I auditioned it at Zennor Sounds, a beautiful ATC-equipped Atmos studio, the results were intriguing. The system's provenance has led to a lot of work happening at British Grove and this system is being promoted as a production tool, not just a playback system for consumers. The immersion is impressive, I was particularly struck by how much could be achieved with just two AirSound speakers, one in front and one behind. This has got the attention of lots of professionals and it will be interesting to see how it is received by the people who mix Atmos content rather than those who listen to it.

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A speaker cone in a box is still an excellent way to reproduce sound but there is a lot which can be done in the sphere of sound reproduction without having to introduce plasma tweeters or rumble packs into our chairs!

What developments in speaker design have you come across which have left you thinking you've seen something genuinely

background in live sound and has been a Pro Tools user since 2001. He lives by the sea in West Cornwall where he plays piano, bass and guitar equally badly and is an avid collector of microphones and opinions about all things audio.

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