

Pro Note



Addressing the coverage limitations of point source loudspeakers with DML technology

An article recently published by [ProSoundWeb](#)¹ provides a technical deep dive into optimizing point source loudspeakers for specific coverage areas. While the engineering challenges and solutions discussed are impressive, they also highlight some inherent limitations of point source technology—limitations that Distributed Mode Loudspeaker (DML) technology inherently overcomes.

1. Simplifying coverage prediction

The article describes intricate prediction models to control sound distribution in the vertical plane, emphasizing the need for accurate placement, alignment, and steering of point source loudspeakers. These complexities arise from their narrow, focused acoustic waves and correlated sound output, which interact destructively with reflective surfaces, creating room echoes, comb filtering, and inconsistent coverage.

DML loudspeakers eliminate these issues by design. Their diffuse, uncorrelated sound waves do not interact destructively in the same way. With 165° conical coverage, DML panels project uncorrelated, diffuse sound waves, producing uniform audio quality without the need for cumbersome prediction models. Placement becomes a simpler task, reducing time and costs while delivering superior intelligibility.

2. Comb filtering and room interaction

Point source systems often require precise placement and electronic manipulation to mitigate comb filtering and other artifacts caused by correlated sound waves reflecting off hard surfaces. This issue becomes even more pronounced in spaces with challenging acoustics, such as those dominated by hard, flat, reflective surfaces.

DML technology sidesteps this problem altogether. By generating uncorrelated sound waves, DML loudspeakers effectively nullify room echoes and comb filtering, creating a natural, immersive audio experience. This innovation means that in spaces lacking acoustic treatments, like many auditoriums, houses of worship, and conference centers, DML systems deliver clarity and consistency that point source systems are incapable of delivering.

3. Achieving coverage in complex environments

Point source systems are constrained by their need to be “steered” or aimed in specific directions to achieve coverage, often necessitating an array of speakers and extensive modeling. This approach not only increases system complexity but also makes achieving uniform coverage in asymmetrical or multi-use spaces particularly challenging.

In contrast, the wide dispersion of DML loudspeakers eliminates the need for such precise aiming or steering. Their uniform coverage ensures every seat in the room experiences the same high-quality sound, whether it’s in the front row, back corner, or balcony. This consistency is why DML systems are increasingly the choice for venues where intelligibility, immersion, and ease of installation are paramount.

4. Stereo field and immersion

The article touches on the challenges of achieving coherent sound in a large space with point source systems, but it overlooks a key limitation: the “sweet spot.” Traditional point source loudspeakers concentrate optimal stereo imaging in a narrow field, which quickly deteriorates as listeners move away from this area.

DML technology revolutionizes the listening experience by expanding the “sweet spot” to encompass the entire room. The stereo field remains consistent regardless of listener position, offering a fully immersive experience no matter where an audience member is seated. This characteristic makes DML systems particularly appealing for spaces like concert halls and high-end home theaters.

5. Perceived loudness vs. measured

The article assumes that high sound pressure levels (SPL) are necessary to achieve adequate coverage and loudness, a common misconception rooted in point source technology. DML systems achieve higher perceived loudness with lower SPLs due to their unique panel resonance technology. This not only reduces ear fatigue for listeners but also better protects the hearing of attendees in venues where prolonged exposure is a concern.

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6. Cost and sustainability

Finally, while point source systems demand extensive planning, multiple components, and ongoing electronic calibration to address their limitations, DML systems provide a cost-effective and sustainable alternative. Their simplicity of installation, reduced need for corrective electronics, and consistent performance lower both upfront and long-term expenses.

Conclusion

While point source loudspeaker technology has long been a staple of the professional audio industry, its limitations are becoming increasingly evident as venues and audiences demand more immersive, intelligible, and user-friendly sound systems. DML technology offers a transformative alternative, addressing the very challenges highlighted in the ProSoundWeb article while providing additional benefits that make it the sound reinforcement solution of the future.

As the industry evolves, it's time to look beyond the limitations of point source systems and embrace the innovations that DML technology brings to the table.



¹Michael Lawrence: Dimensional Focus, Part 1: Creating Coverage Prediction Models In The Vertical Plane, *ProSoundWeb*, November 25, 2024.