



MISCO[®]
The Sound of Imagination™

CASE STUDY

Creating Immersive Audio Without Traditional Loudspeakers



Sound has an uncanny ability to touch our minds and create experiences that live on in our hearts long after it fades away.

Imagine this sound: CLANG ... CLANG ... CLANG—a hammer banging against copper sheeting in a workshop in Paris more than a century ago. Each strike of metal on metal is one iota of progress toward the construction of the Statue of Liberty.

Today, the sound you're imagining is recreated and played for visitors as they stroll through the Statue of Liberty Museum in New York. The clanging, mixed in with the sounds of fanfare from the opening day ceremonies in 1886, transports museum visitors back in time to the statue's origins and makes Lady Liberty come alive in a whole new way.

However, the noises in the museum don't come from visually distracting loudspeakers. They seem to be the natural sounds of the space itself. This aural magic trick is the work of SH Acoustics, which has been a pioneer in multimedia exhibits in museums for three decades (as well as a leader in delivering enhanced acoustical environments in homes, theaters, performance halls, and commercial spaces).

Cover: SH Acoustic creates immersive soundscapes for exhibits like the Museum of the American Revolution with hidden MISCO transducers. Below: Visitors hear the sounds of workers creating the Statue of Liberty without any visible speakers thanks to SH Acoustic's capabilities.



Developing New Technologies

A speaker is generally thought of as a transducer with a moving coil attached to a larger speaker cone. SH Acoustics, however, thinks outside that box and is at the cutting edge of attaching transducers to other objects to create high-quality sound. Their experts can turn anything, such as a display case, a wall, or a bench, into something that can generate sound waves. The SH Acoustics team can then orchestrate all those invisible audio delivery points to give visitors a truly immersive experience.

“It’s not like EQing a speaker,” says Steve Haas, CEO at SH Acoustics. “It’s a very different mentality.”

The SH Acoustics team has extensive experience and expertise with Young’s modulus. Young’s modulus is a measure of the tensile or compressive stiffness of a material when force is applied to it, which helps determine whether and how a surface can be used to create sound waves.

When SH Acoustics was developing its technical strategies decades ago, they were “experimenting with whatever we could get our hands on,” says Steve. The problem was that the transducers (or exciters) they were getting from a factory in China were not reliable. He estimates about 30% had issues right out of the box, and many blew out if too much power was fed into them. That made delivering consistent quality to SH Acoustics clients a huge challenge.

Steve says they needed something more robust that they could make their own.

“We came to MISCO through a manufacturer in North Dakota that we were working with and who [had been] very familiar with MISCO for many years. And they basically said, ‘If you want somebody that can produce something very reliable, that is going to be to your spec—they can tweak it, adjust it, whatever they need to—you need to go to MISCO.’”

Steve brought the transducer they were using to Dan Digre, MISCO’s CEO and President. They “reworked it using the MISCO magic—and quality, of course—and, that’s really what led to our proprietary product,” says Steve. That was more than 20 years ago.



SH Acoustics can create excellent sound from museum exhibit objects with just a little more than an inch of depth for MISCO's transducers to operate within.

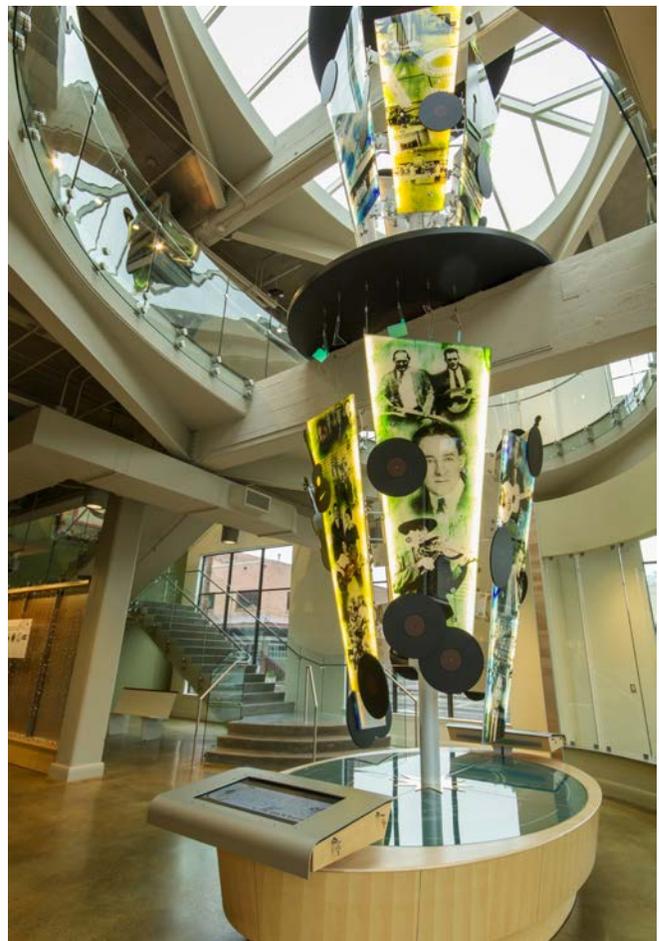
The MISCO transducer SH Acoustics uses is just about an inch deep (including excursion), which gives them the ability to conceal their devices in small spaces, heightening the effect of the audio seeming to come out of nowhere.

“The reliability, the durability, the quality, and the form factor of these transducers...means we can basically do these kinds of applications with just a little bit of room,” says Steve. “Trying to find a speaker that can produce the range, frequency response, in just a hair over an inch, of this good quality... with the broad dispersion on top of it, it just doesn't exist.”

SH Acoustics has used MISCO's transducers to deploy their technology everywhere, including inside cast statues at the Museum of the American Revolution, and even a bench at the National Museum of African American History and Culture.

“These applications don't just stay with museums,” says Steve. “We've used these in high-end residential applications and in recording studios, where literally we've designed systems that create virtual acoustics, meaning concert hall acoustics, electronically.”

“We have learned that this technology, meaning transducers on certain types of personalized materials, sounds more natural in some cases than almost any speaker. ... We call them Activated Sound Panel, or 'ASP' applications, where it's certain materials that are activated by these transducers that we get from MISCO. ... And we've had top artists, classical musicians, opera singers, everybody from Renée Fleming to Yo-Yo Ma, in places where we've done this, too. And they just cannot believe how natural it sounds.”



The Birthplace of Country Music Museum in Bristol, VA had SH Acoustic use 12 digitally printed acrylic panels to deliver the soundscape for visitors.

SH Acoustics has used MISCO transducers and their proprietary technology to create soundscapes in many world-class museums, including:

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- Canadian Museum for Human Rights in Winnipeg
 - Canadian Museum of History in Québec
 - Indiana State Museum in Indianapolis
 - Museum of the American Revolution in Philadelphia
 - Museum of the Bible in Washington, D.C.
 - National Constitution Center in Philadelphia
 - National Geographic Museum in Washington, D.C.
 - Smithsonian National Museum of African American History and Culture in Washington, D.C.
 - Newseum in Washington D.C.
 - Obama Presidential Center in Chicago
 - Statue of Liberty Museum in New York
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Reasons SH Acoustics works with MISCO include MISCO's:

- Consistent, reliable transducers
- Commitment to being a strategic partner on quality
- Manufacturing in the USA

Images from the top: 1) Museum of the American Revolution in Philadelphia; 2) The National WWI Museum and Memorial in Kansas City; 3 & 4) The Smithsonian National Museum of African American History and Culture in Washington, D.C.



Continuing to Fine-Tune Technology

"I train my people to always be looking out for ways of improving something, even if it's not broken," says Steve. "So every few years, I'll go to Dan and say, 'Okay, so what do you got?' How can we improve on what we have? And is it worth it? We've become experts at using this particular product in our range of applications to get the results we need for our sales and our clients. But if there's something that can make our life easier, whether it's quality or attachments or whatever, we just want to know...And, you know, it's just been a great ride."

If you want to improve the quality and consistency of your transducers, full speakers, or complete audio systems, the MISCO team would be happy to have a conversation about your biggest needs. **Please reach out to us.**



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