

**Audio Spotlight® Sound System Research Report**  
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First, I must thank Arts and Sciences and the Vice President for Research and Graduate Studies for funding this area of research. Upon receiving the letter stating the funding, I immediately ordered the device. However, it took longer than expected to arrive. I did not have the pleasure of working with the system until my return to the University at the beginning of the fall semester. As part of my original proposal, I was searching for a way to send sound to specific areas rather than general ones. Conventional speakers are

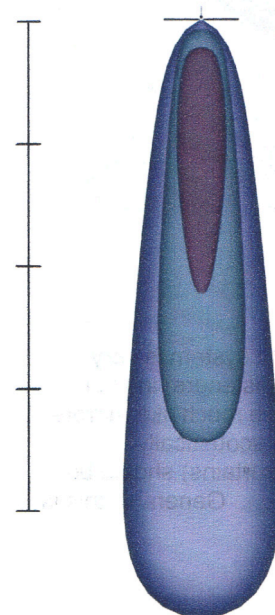
typically designed for maximum dispersion of sound, in order to cover large areas.

The Audio Spotlight® is a new type of transducer (speaker) capable of delivering sound to what it is pointed at (see figure 1). The transducer itself does not vibrate but rather utilizes the air as the “speaker.”

My first trial with the instrument was surprising. I had never heard sound delivered in this way. While holding the transducer and pointing it toward a distant wall, the reflection of the sound from the wall was louder than the source of the sound. With conventional speakers, the wide dispersion angle causes the listener to hear more of the original source than reflections off of distant objects. After this discovery, I began pointing it at different surfaces in order to hear the results. As suspected, softer surfaces provided little to no reflection and hard ones such as cinder blocks and metal provided a distinct reflection.

For theatrical productions, I have determined the Audio Spotlight® to be useful in at least two ways. One use would be to reflect sound off of hard objects on the stage towards the audience. For instance, when a real sound emitting object such as a radio is required on stage by the script, rather than rigging the radio for sound, the Audio Spotlight® could be aimed at the front of the radio. Using the radio as a reflective surface, the sound would be projected at the audience providing the perception that the item on stage is making the sound. This practice would be more successful in our smaller Helms theatre. I will define why later in this report.

A second use would be to point the Audio Spotlight® directly at audience members for special effect. The transducer panel could be “swept” across the audience so that two or three listeners perceive the sound at a given time. I am now ready to test these potential



*Figure 1 Audio Spotlight®  
Manual Page 11*

uses. The scene shop for our theatres created a special mounting bracket, and the device is ready for incorporation into our productions.

The Audio Spotlight® does not perform completely as I suspected. As I understood, the system was capable of transmitting direct sound for several hundred feet. In my initial tests, it was apparent that this device is useful mainly for short distances. It is my opinion that for theatrical purposes, it would require a quiet moment in the action for the sound to be perceived well. It presents a “delicate” sound until pointed directly at you, and then it seems a bit “telephonic” in quality.

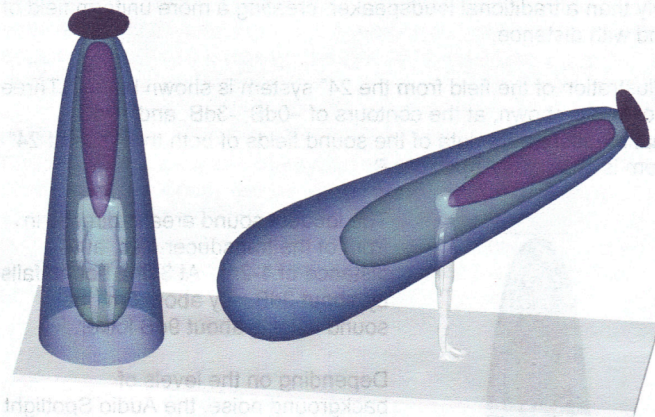


Figure 2 Audio Spotlight® Manual Page 12

The sound dispersion of the Audio Spotlight® can be likened to a directional beam of light, like a flashlight (see figure 2). Its best use is for delivering sound to an isolated area. According to the supplied manual, the most present sound is at a distance of around six feet while listening directly in front of the disc. At fifteen feet away from the disc, the sound level drops by about 9 decibels. Based on these specifications, its best use would be in a small environment where sound

“bleed” is an issue. Museums utilize similar devices when multiple media kiosks must be confined to a central area. Occasionally, we may utilize the Audio Spotlight® in our lobby for similar presentations.

This semester, I have started introducing the Audio Spotlight® into my DRAM 262 (Survey of Sound) class. As an alternate way of projecting sound, it seems to illustrate why conventional speakers sound as they do. It provides more answers for how conventional speakers work rather than creating questions within those who hear it about why *it* works the way it does. As I learn more about it as a tool for sound, I will be able to present it as a practical system for sound in the theatre rather than just a device for comparison.

If interested, I will present the Audio Spotlight® to those who supported this grant. The components are relatively small and can be carried to any location. I also welcome those interested to visit my classroom when I present the device to my students next semester. It is worth hearing.

*Pompei, Dr. F. Joseph. Audio Spotlight® User's Manual. Watertown: Holosonic Research Labs, 2004.*