

19th House District

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New Albany, Westerville, Minerva Park,
and area townships



134th General Assembly Committees

Energy and Natural Resources
Health
Higher Education and Career Readiness
Primary & Secondary Education
Technology and Innovation, Ranking Member

Representative Mary Lightbody 19th House District

Testimony to the Senate Veterans and Public Safety Committee
House Concurrent Resolution 32
Mary Lightbody, Ph.D. <> November 15, 2022

Chairman Hoagland, Vice Chair Johnson, Ranking Member Thomas, and members of the Senate Veterans and Public Safety Committee, thank you for allowing me to testify in support of House Concurrent Resolution 32, which recommends that the Air Force Research Lab (AFRL) at Wright Patterson Air Force Base recognize the late Colonel William J. Cavanaugh for his contribution to the design and architecture of the AFRL Bio Acoustics Laboratory. The idea for this resolution came to me from his son, John Cavanaugh, who is one of my constituents and is here today to provide testimony in support of this resolution. I thank you for allowing him to testify today as well.

The late William J. Cavanaugh began his Army career in the ROTC program at the Massachusetts Institute of Technology. He was commissioned 2nd Lieutenant and served as unit training and staff officer with the 6th Armored Div. and Army Corp of Engineers at Ft. Leonard Wood, in Missouri during the Korean War. He remained in US Army Reserves as he founded and began work at Cavanaugh Tocci Associates. He retired at the rank of full Colonel in 1982 after 31 years of continuous service.¹

Colonel Cavanaugh was a leader in the design and construction of this facility in 1955 at Wright Patterson Air Force Base; the chamber is still in use today, some six decades later. The chamber was designed to be an environment absolutely without echoes and to be as close to near silence as possible to study battlefield acoustics and develop new technologies.

As described in Wired magazine: "Battlefields are noisy places, and pilots and soldiers often struggle to filter out information and communication from the chaos of combat. Ideally, the soldiers, air crews, or sailors would be able to ignore the unimportant sounds, identify the important ones, and tell where they're coming from."²

Additional research in recent years has included the development of innovative technologies and procedures and transitioning them to field use. Frequently these products have application not only for Air Force use, but also for Army, Navy, Marine Corps, and civilian sectors.

¹ Air Force Museum. legacydataplates.com

² Adams, E. (2018). Step inside the Air Force's sound-swallowing anechoic chamber. Wired. <https://www.wired.com/story/air-force-anechoic-chamber-acoustic-study/>

Some examples include

- the Attenuating Custom Communication Earpiece System (ACCES)
- high performance active noise reduction earplugs
- helmets specifically designed to reduce bone conducted noise
- tactical hearing protection (earplugs or earmuffs with active electronics to provide ambient listening, communication, and localization capabilities)
- low-cost head orientation system, and spatial auditory symbology³.

The anechoic chamber designed by Col. Cavanaugh was constructed using a deep sand buffer, forty-two-inch-long fiberglass wedges, and a 14-foot sphere lined with loudspeakers. The American Institute of Physics has published Colonel Cavanaugh's oral history, in which he explains this groundbreaking architectural achievement in Ohio as one of the capstones of his career.⁴ I can provide more information about the facility if members would like, although my own understanding of Col. Cavanaugh's significant breakthrough in design can be better explained by Mr. John Cavanaugh. He has a much better understanding of it than I do and I am sure his testimony as a proponent of this resolution will provide details I can not.

The Technical Committee on Architectural Acoustics of the Acoustical Society of America, has voted to endorse this naming effort.

This resolution received unanimous support in the House Armed Services and Veterans Affairs Committee as well as on the House floor. I hope that you will agree that this is a fitting honor.

I have discussed this resolution with key personnel at Wright Patterson Air Force Base. They are supportive of this effort and will find a suitable way to recognize the contribution of Col. Cavanaugh when this resolution becomes official.

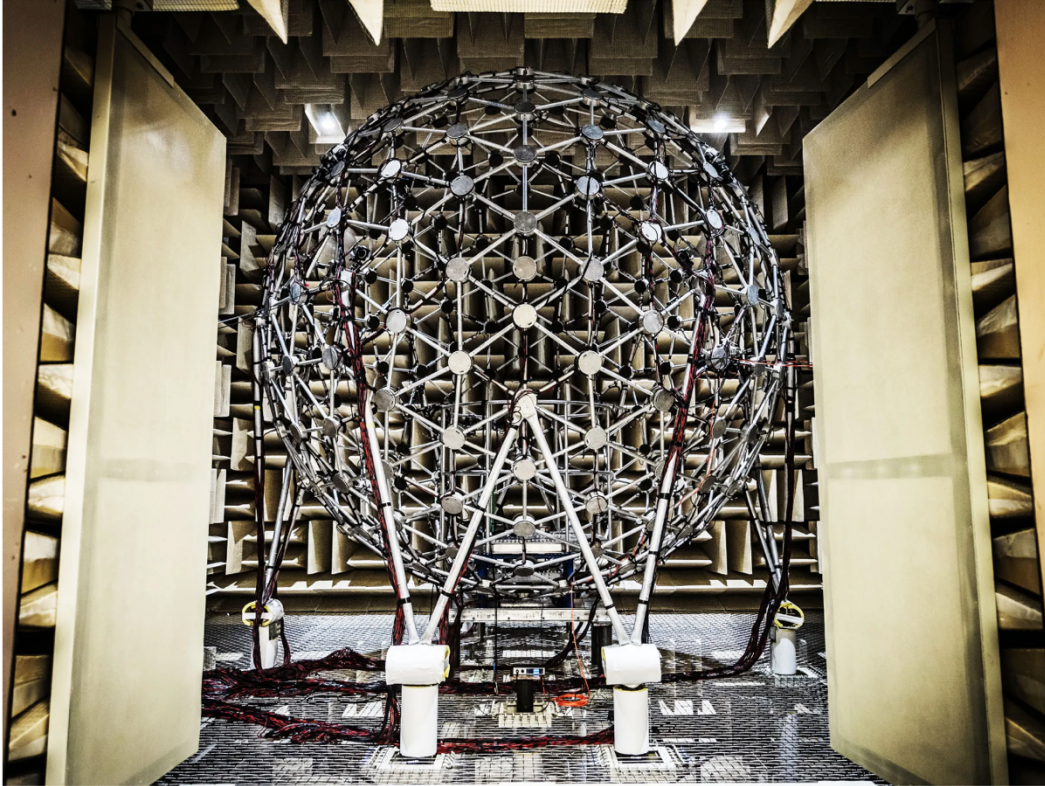
Thank you for providing Rep. Lampton, John Cavanaugh and I the opportunity to testify today. I hope that the Veterans and Public Safety Committee will support this resolution. I would be happy to do my best to answer any questions the committee members may have.

Note: Images of the chamber have been included on the following page. These are screenshots taken from the WIRED magazine article, footnoted on the first page of this testimony.

³ McKinley, Richard. (2010). Auditory and Acoustic Research & Development at Air Force Research Laboratory (AFRL). *Acoustics Today*. 6. 22. 10.1121/1.3373153.

⁴ Carballeira, A. (2017). Oral history interview with William Cavanaugh. American Institute of Physics. <https://www.aip.org/history-programs/niels-bohr-library/oral-histories/45493>

Images of the AFRL Bio Acoustics Laboratory at Wright-Patterson Air Force Base



The Air Force Research Lab's test facility aims 277 loudspeakers in a 14-foot sphere toward a test stand, where a subject or sensor array sits. ECKEL NOISE CONTROL TECHNOLOGIES



The anechoic chamber can also assess the acoustic properties of vehicles and research strategies for helping occupants better process incoming sounds on the battlefield. ECKEL NOISE CONTROL TECHNOLOGIES