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JAMES LOUDSPEAKER CASE STUDY.



ACCOMMODATE THE CLIENT
James Loudspeaker designs a customized audio solution for a museum theater experience in the confines of a retired MD-80 jetliner

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JAMES LOUDSPEAKER STEAMPUNK CASE STUDY: Tulsa Air & Space Museum (October, 2016)



Tulsa Air & Space Museum's American Airlines MD-80

Case Study

The Tulsa Air & Space Museum's (TASM) mission is to preserve Oklahoma's aerospace heritage, inspiring science-based learning through discovery. Aviation is a big part of Tulsa's sense of community and economy, with American Airlines having a sizable plant there. The museum resides on a 17.8 acre campus adjacent to the Tulsa International Airport and includes a planetarium, which helps bring a unique and engaging state-of-the-art interactive experience to the region. In 2013, TASM opened the doors of the new Discovery Center, featuring a gift from American

Airlines – a retired MD-80 aircraft. Currently used for educational activities and private events, the MD-80 Discovery Center features a one-of-a-kind interactive experience showcasing the wonder of flight. In order to deliver a visceral sensory experience for patrons, the MD-80 Discovery Center required a precisely engineered audio/video system—and the museum called upon custom integration specialist Josh Onley of Video Revolution to help make their interactive concept become a reality.



MD-80 FLIGHT THEATER
Video 1



TULSA AIR & SPACE MUSEUM'S MD-80
Video 2



Video Revolution team working on the jetliner

The Plane, The Plane

It isn't every day that integration professionals are asked to outfit a commercial jetliner with an audio/video system. After assessing the scope of the project and gaining a clear understanding of the museum's vision for the exhibit, Onley and his team set about designing an almost completely invisible 7.1 surround A/V system for the forward section of the MD-80 that would serve as a theater. The process began with American Airlines technicians removing many of the interior panels from the jet so that Onley and his team could precisely understand the space (or lack thereof) they had available for loudspeakers, subwoofers, wiring and electronics. With clear access to the cavity behind the interior panels as well as the luggage area below the cabin, it became clear that a very specialized approach would be required to fill the theater area with clear, detailed and balanced audio—without disrupting the visual appeal of the aircraft. Onley noted that at the top of each window trim panel was a vent—ideal for discreetly passing audio but challenging due the small area behind each vent. After taking careful measurements, Onley placed a call to James Loudspeaker.



Panel vents allow sound to fill the theater

Custom Solution

James Loudspeaker has earned a reputation for successfully addressing unique applications and creating solutions that help integrators get the job done. Lead designer and James Loudspeaker CTO Mike Park studied Onley's measurements for the space and envisioned a completely customized slot-firing aircraft-grade aluminum form factor featuring two 3.5-inch woofers and the concentrically-mounted mid/tweeter module borrowed from company's legendary 63SA-4 Small Aperture speaker. Park created drawing of the custom aluminum enclosure that would meet the required specifications of the loudspeaker drivers while fitting neatly inside the fuselage of the jet and cleverly aim the sound into the theater through the original trim panel vents. Designed to deliver discreet appearance, superb sound quality and high-output levels, the MD-80 custom speaker is ideally suited to the task of delivering refined sound where critical listening is paramount and aesthetics are equally as vital. Park was able to create a solution, present the drawings to Onley for



approval and then deliver eight of the finished custom loudspeakers all within a matter of weeks (7.1 system with two center speakers). "Mike, Jason and everyone at James Loudspeaker was able to create a workable solution that enabled us to deliver the sound quality and the invisibility we had promised to the client," explained Video Revolution principal Josh Onley. "We rely on James Loudspeaker as a critical partner committed and capable of delivering custom solutions like this—it empowers us to best serve our clients and differentiate ourselves from competitors," added Onley.



James Loudspeaker created a custom speaker for the 7.1 system in the plane



James Loudspeaker PowerPipe subwoofer resides in the luggage area

The Thunder from Down Under

In order to supply the visceral and detailed bass response required for the MD-80 theater, Onley used a James Loudspeaker 1200PT-2 dual port 12-inch PowerPipe subwoofer. The PowerPipe is a mainstay of the James Loudspeaker product lineup, enabling integrators to provide extended, detailed bass into environments where high-performance and a discreet visual presentation are paramount. The design concept behind the PowerPipe is to move large amounts of air using all aluminum drivers through a 4-inch bandpass flex-tube, creating a tuned system that provides earth-moving bass down to 22Hz. Based on the high-output capability of the 1200PT-2, only one was required (paired with a James Loudspeaker M-1000 amplifier with DSP control for fine-tuning) to deliver more than ample bass for the theater. Onley located the 1200PT-2 in the luggage bay beneath the theater, venting the bass through a custom toe-kick grille that is all but invisible.

Additional Details

The dual center channel speakers are the only part of the system that is visible by design, so James Loudspeaker matched the American Airlines speckled paint used on the interior panel to create a seamless, unobtrusive appearance. All of the related electronics for the theater were housed in a rack built for the galley area, delivering an array of surround formats and a total of 2040 watts of amplifier power. “The museum uses this system every day—we wanted the solution to have plenty of headroom so it could work efficiently and reliably for hours at a time,” Onley added. “Most critically, the TASM team loves the system, and as an integrator I am certainly thankful for a specialized vendor/partner like James Loudspeaker to create solutions for me where nothing off the shelf would do the job.”



Final Word

“The sound and video system create an immersive experience that is completely unique—almost as if the plane is taking off,” explained former TASM Chairman of the Board Lee Hubby. “All of us at the museum are extremely pleased with what Video Revolution was able to do for us in conjunction with so many volunteer hours from the wonderful people at American Airlines.”