



## The Art and Science of Onsite Tuning a Private Jet's Audio System

by Glen Ashworth, Audio Systems Engineer at ALTO Aviation

Tuning an audio system in a Business Jet is both an art and a science. While the tuning process is rooted in science and data, it requires a highly-skilled and experienced audio systems engineer to effectively tune an audio system.

The founders of ALTO Aviation, Don Hamilton and Steve Scarlata, began their careers tuning new production car models around the world in the 1980s and 1990s, gaining invaluable knowledge and experience. Over the years, they were able to refine their skills to develop the revolutionary ALTO Tuning Process.

Contrary to popular belief, there is no knob turning or slider moving during an audio tuning. A precisely calibrated microphone is used to record acoustic measurements via custom-designed computer software, called the ALTO Measurement Suite. This innovative, proprietary, software not only records these measurements, but processes the results based upon the application and intended use by the customer.



A variety of different characteristics can be controlled or created, including frequency response equalization, phase interaction, surround sound processing, dynamics processing, and more. To begin the tuning process, individual measurements of every loudspeaker and subwoofer are recorded. Next, the sonic signature of each seating position is captured for each set of speakers.



These measurements allow ALTO to accurately predict what the sound will be at each seating location when all the speakers are playing. Minute changes in the phase or delay of a speaker can drastically affect the sound in a seat for better or worse. An iterative process is used to find the best sound for the VIP and every seat in the cabin. Finally, the sound processing is implemented via DSP inside the ALTO amplifier.



Of course, computer software and microphones are useful. However, the real test is the human ear. A skilled audio systems engineer performs the tuning on the aircraft to ensure that the aircraft is tuned perfectly. ALTO welcomes clients to be present during the tuning, to provide input and ensure complete satisfaction.

As part of ALTO's commitment to providing each cabin with outstanding sound quality and customer support, ALTO stores the personalized measurements of each aircraft. Should a replacement amplifier be needed, the custom-tuned settings will be pre-loaded before being delivered to the aircraft.

For more information on ALTO Onsite Custom Tuning, please visit our website at [www.altoaviation.com](http://www.altoaviation.com), contact us at 800 814.0123 or email us at [sales@altoaviation.com](mailto:sales@altoaviation.com) and an ALTO representative will gladly assist you with your request.

July 1, 2015 ALTO Aviation