

ADACEL CUSTOMER TESTIMONIAL



United States Air Force



“The Adacel MaxSim TSS will deliver a state-of-the-art training capability that was not possible with earlier voice recognition and visual technologies...with Adacel, we will deliver a superior training capability to satisfy a critical training need at Air Force guard and Reserve bases worldwide.”

—Thomas L. Harris III, TSS Program Manager, Training Systems Product Group

SOLUTION SUMMARY

Customer

United States Air Force (USAF)

Industry

Military

The Challenge

1. Develop a tower simulation system with a minimum 200-degree vertical field of view, advanced voice recognition and speech synthesis, capable of training 4 controllers simultaneously, and to be contained within a room not exceeding 18' x 15' x 8'.
2. Create a system that marries proven simulation capability with the latest in simulation technology. The system would be user friendly and capable of being operated by 1 person with little or no specialist ATC simulation knowledge.

The Solution

Adacel's MaxSim software combined with a high fidelity, 270-degree horizontal field of view with advanced speaker independent voice recognition control and environmental sound effects.

About the United States Air Force (USAF)

The USAF was born in 1907 and was then called the US Army Signal Corps. This corps established a small aeronautical division to take charge of “all matters pertaining to military ballooning, air machines, and all kindred subjects.” When the national Air Force Act became law in 1947, the department of the Air Force established the USAF, which is headed by the Chief of Staff. Today, the USAF is an integral part of the US defense force and is involved in humanitarian efforts, homeland defense and engineering activities.

The Challenge

USAF needed to create an air traffic control simulation environment where 1 person could operate the system and still allow that operator to carry out instructional and assessment duties with minimal distractions. This consideration required a fresh way of thinking in view that tower simulators are traditionally operated by multiple staff. Clearly in an operational environment, this is unacceptable as the primary duties of tower staff are to support the flying operation. Manning levels at a typical Air Force tower would not allow the effective use of the TSS if multiple operators were required. Adacel's answer was to take its industry leading voice recognition system and, with further development, enable the operator to control and interact with a training scenario using voice commands. It is no longer necessary for the instructor to manually interact with the instructor station.

The MaxSim Solution

As a result, MaxSim has been selected by the United States Air Force to fulfill its requirements for up to 94 air traffic control tower simulators. Each of the identical Air Force simulation systems provide a



high fidelity, 270-degree horizontal field of view with advanced voice recognition control. These systems will be installed at various Air Force bases around the world and would include total system support, training and maintenance options for 9 years.

MaxSim accommodates evolving customer training and research objectives by marrying proven air traffic control (ATC) simulation technology with the world's best interactive voice and graphics products. The visual scene can be scaled from a single channel desktop display to a 360-degree projected scene in a full-scale cabin environment. MaxSim provides a fully immersive training or research environment by integrating accurate and life-like out-the-window views with intelligent automatic aircraft behavior, as well as, aircraft and environmental sound effects.

Furthering the total immersion training experience, each MaxSim system is equipped with speech recognition. These synthetic pilot voices are available in many regional and national accents, and these voices are indistinguishable from those of real pilots. Adacel's MaxSim has the ability to mix aircraft cockpit noises and radio interference into the scenario, providing an enhanced level of realism to the user.

The MaxSim Instructor station has an advanced voice control capability that allows the instructor to interact with and change a running scenario using voice commands as a replacement or enhancement to keyboard operations. This technology greatly increases the efficiency of the simulator operator and allows scenarios to be controlled and supervised by a single person.

The system allows the scenario to be paused to allow teaching points to be reviewed. The instructor may choose to rewind the scenario and at any time during the review process and/or choose to resume training. This powerful capability ensures that maximum teaching and learning benefit can be gained from the scenario without having to stop and restart the exercise.

MaxSim includes advanced civil and military functionality and supports both FAA and ICAO procedures. The high level of simulated aircraft and vehicle intelligence provides extremely realistic automated pilot behavior.

Whether used for tower or ramp training, the study of new airport procedures or airport planning, MaxSim is the most mature, proven and cost effective system on the market, allowing the USAF to soar to even greater heights.

USAF TSS Solution:

- 1360 x 1024 resolution, 6 channel, rear projected, high fidelity main visual scene
- 270 degree x 34 degree field of view
- Photo textured airport visual scenes.
- Full scene anti-aliasing supporting 75 moving models @ 30 Hz
- Independent ground controller visual scene display
- Local, ground, coordinator and flight data training positions
- Speaker independent voice recognition with built in noise cancellation
- Instructor station with voice recognition input and pseudo pilot capability
- Voice recognition capability at 4 positions
- Realistic pilot voices including aircraft cockpit noises and RT interference
- Integrated voice and simulation record and playback including backup and resume exercise
- DBRITE, Lighting Panel, Wind and weather information, NOTAM, supplementary Information, Crash phone and Dual Light Guns
- Comprehensive ground and airborne formation functionalities including overhead entries and simulated flame outs
- Look down view and binocular capability on main visual display and ground controller independent display
- Multiple user eye-points include views as seen from the cockpit, Binocular view with automatic aircraft or vehicle tracking, Free Movement View allowing complete freedom to move around the simulated air base and the ability to rotate the view around a selected target.
- Realistic weather effects including rain, hail, snow, fog, shallow fog, sandstorm, snow squalls, compact and loose ground snow, cloud to cloud and cloud to ground lightning
- Cloud simulation including Stratus, Cumulus, Cumulonimbus, Towering Cumulonimbus, Altostratus, Cirrocumulus, Cirrus, Nimbostratus, and Stratocumulus.
- Full Diurnal modeling including accurate local model for position of stars, sun and moon according to the date and time of day.

- Definable aircraft profiles such as spiral climbs, Low level VFR, Pipeline following, TACAN Approaches, Tower Fly By etc
- Simulated emergencies, e.g., partial or full gear failure, hydraulic failure, R/T failure, Low Fuel, aircraft fires
- Voice communication system emulating Litton Denro ETVS with configurable HMI's
- Hide/unhide, freeze/unfreeze, add new target and terminate/activate aircraft during running scenario
- High Quality purpose designed consoles
- Simulation event system allows any aircraft to make any transmission at any time.
- Integrated approach, runway, taxiway and airport lighting are supported, with site-specific lighting panels and multiple levels of lighting intensity.
- Flexible aircraft performance databases, allow multiple performance capabilities for the same aircraft types.
- Visual effects - fires, explosions, flocks of birds, parachutes and collisions.
- Wheels up landings, hydraulic failure, aircraft crash, low fuel, cable engagements and bird strike emergency training.
- Environmental sound effects including wind and rain noises, thunder and aircraft sounds.
- Extensive, high quality, aircraft and vehicle model libraries.
- Other capabilities: Helicopter sling operation and ground control operation i.e.: emergency reaction and parachute recovery

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