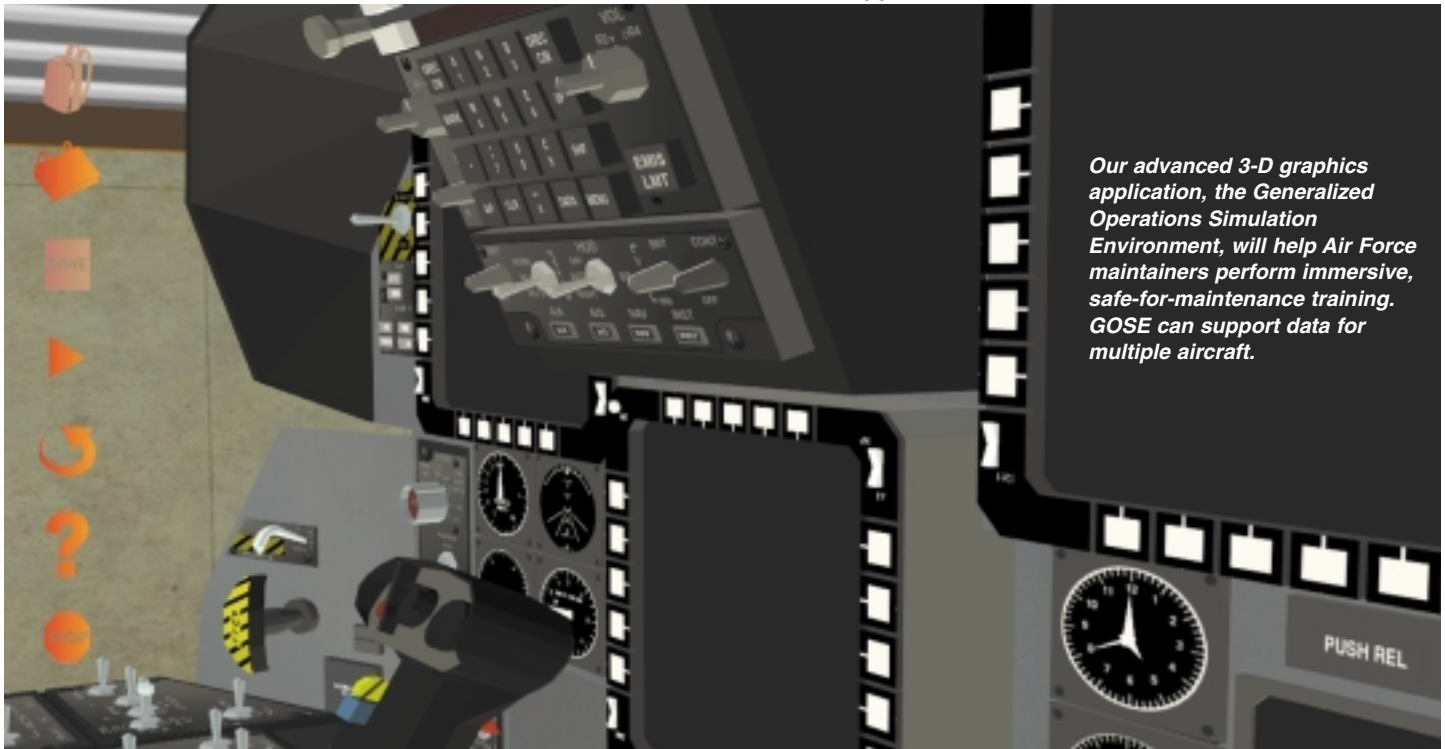


Training, Simulation & Performance Improvement



Our advanced 3-D graphics application, the Generalized Operations Simulation Environment, will help Air Force maintainers perform immersive, safe-for-maintenance training. GOSE can support data for multiple aircraft.

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Combining low-cost desktop computers with our expertise in technology-based systems, Southwest Research Institute offers innovative solutions in simulation, training and performance support. For instance, we developed our own three-dimensional Graphics Interface Library, called **Grall™**, that eliminates reliance on commercial 3-D engines. With Grall, we offer clients flexible, cost-effective solutions for graphics-intensive efforts.

Using Grall to produce realistic models of the human heart, lungs and blood vessels, we are developing Interactive Virtual Human Body software to teach cardiovascular anatomy and physiology to medical personnel

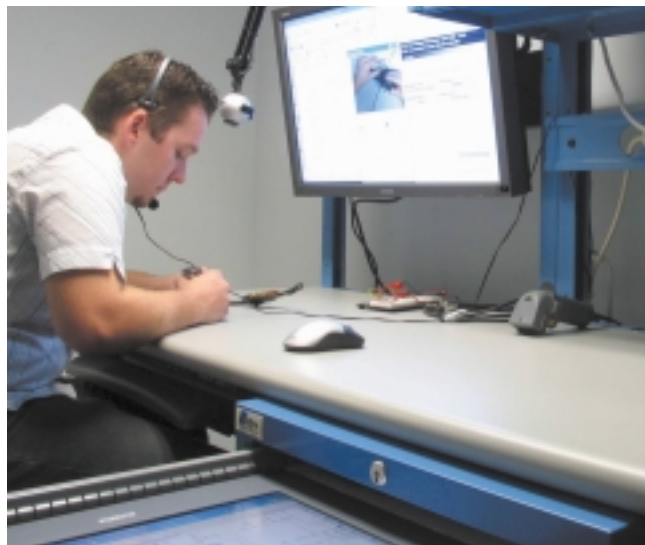
Technicians in industrial environments can access numerous digital resources from a single location using our Logitech-Bench™. The prototype includes dual monitor displays, wireless keyboard and mouse, video capture, audio input and output, and other support hardware such as oscilloscopes.

(instructional.swri.org). Students better assimilate complex medical information using this interactive, 3-D learning environment over existing systems that use two-dimensional, static graphics.

Another effort capitalizing on Grall's 3-D graphics is the Generalized

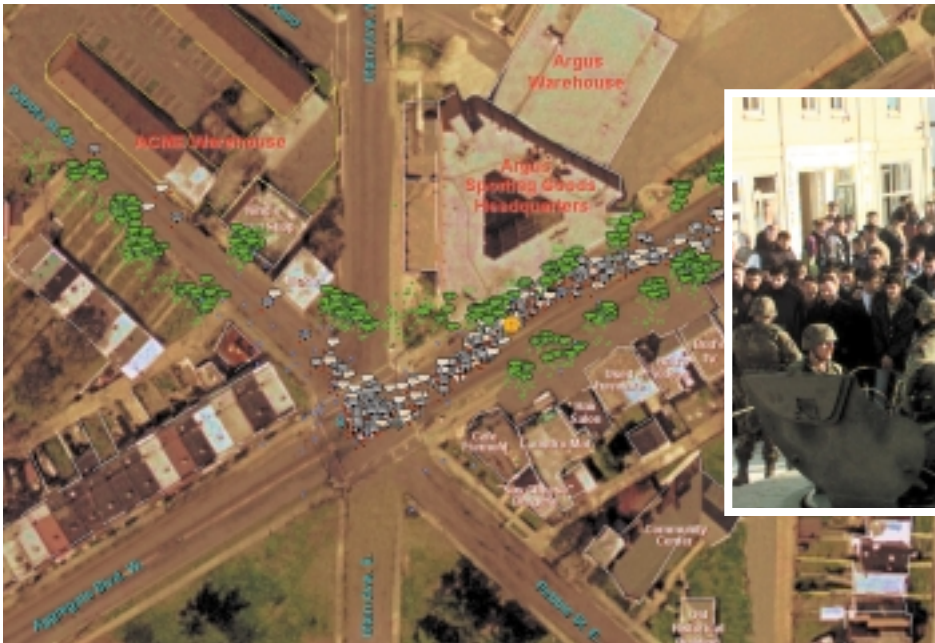
Operations Simulation Environment (GOSE) for the Air Force. This web-based tool will help train [aircraft maintenance](#) personnel to ensure various aircraft systems are off-line and that it's safe to begin maintenance. The software's generalized architecture makes it a flexible tool so that data for numerous aircraft and weapons systems can be loaded.

Current events have increased the need for modeling systems that simulate crowd behavior (simulation.swri.org). Our Modeling of Aggregates and Crowd Evaluation software, called **MACE Station™**, patent pending, is a prototype platform for developing, analyzing and researching the actions of individuals in group, or aggregate, situations. Existing tools model an aggregate as a whole rather than modeling the unique behaviors of each individual. With the MACE Station, individuals follow and lead, show aggression and resistance, and



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- operations & maintenance training devices & simulators • performance & decision support systems • web-based training • training needs assessment • instructional systems development • physics-based modeling • computer-generated forces • aggregate behavior modeling •



Courtesy DOD, photo by Spc. Sean A. Terry, U.S. Army

We developed a tool for modeling crowd behavior based on the unique behaviors of each individual. With the MACE Station, users can learn how to control a scene by building real-world scenarios (inset) and populating them with individuals that can loot, vandalize, heckle, protest and more.

otherwise respond distinctly, creating the overall group dynamics.

While industry and government increasingly employ digital technology, production shops have been slow to incorporate corresponding equipment. In this environment, technicians must move from benches to computers to reference files and back again. Our **Logitech-Bench™**, developed using internal research funds, allows technicians to access necessary resources at a single station. The system brings together parts, repair histories, schematics, training references, expert knowledge databases and more, depending on job requirements.

We continue to support training upgrades for the AWACS aircraft, a vital element of Air Force Command and Control activities. We recently applied a **Link-16** upgrade that allows students to train in a live or virtual environment using data link communications in addition to voice, significantly expanding the range of student control features. We are also employing the Tactical Display Framework software to provide additional command and control training systems. SwRI's

The Interactive Virtual Human Body desktop software allows medical personnel to use 3-D interactive simulations to improve students' understanding of human anatomy and physiology.

software-based **audio distribution system**, developed using internal funds, will replace existing hardware-intensive, proprietary communications systems. This system operates on the existing AWACS console computers and includes atmospheric, secure cryptographic and frequency hopping radio effects to enhance the training experience.

Some estimates suggest that 60 percent of the current workforce will be

eligible for retirement in the next five years. SwRI developed a generic **expert knowledge management** model to help retain the expertise of highly skilled employees. We are also creating a Civilian Career Development Program for the Ogden Air Logistics Center. One feature of this powerful **career-mapping tool** allows personnel to enter information about current jobs and desired civilian jobs. The program then generates a career map specific to their goals. ❖

Visit tssystems.swri.org for more information or contact Vice President Dr. Katharine C. Golas at (210) 522-2094 or kgolas@swri.org.

