



Originally developed through the DOD SBIR program, PARASIM has been the standard for aircrew and paratrooper training for nearly 20 years, with over 300 systems sold worldwide.



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hen the U.S. Forestry Service “Smoke Jumpers” needed a better training solution for its crew, California-based Systems Technology, Inc. (STI) responded by providing a safe, effective means of parachuting training on the ground. Twenty years

later, the PARASIM system has evolved into an interactive training simulator that enables parachute jumpers to hone their skills and plan missions on the ground before real-world missions. Combining 3-D virtual reality technology with validated parachute dynamics and realistic controls, it simulates what jumpers see and experience, in real-time.

PHASE III SUCCESS

STI has sold its PARASIM system to the U.S. Army, Navy, Air Force and Marines for premeditated airborne operations and emergency egress training. The system has also been used by military forces around the world for over 10 years, and has a continually growing global presence.

AGENCIES

DOD, NASA, NIH

SNAPSHOT

STI delivers simulation products and engineering consulting services to customers throughout the Air Force, USSOCOM, and the Navy.

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Short for the Advanced Special Operations Planning and Rehearsal Parachute Simulation Database Generation, PARASIM recreates a 3-D experience of a jump with controls, real world scenes, lighting effects, various weather conditions, and a full library of terrain types. Virtual canopies animate in response to jumper steering inputs and offer a full range of canopy malfunction. The system found its home within the U.S. military, which continues to purchase the PARASIM system year after year for its various training purposes.

It was the USSOCOM Small Business Innovation Research (SBIR) program that brought about the development of this technology, and STI has since utilized hundreds of SBIR awards through both the DOD and NASA to deliver cutting edge simulation technology to the U.S. government.

“There were many surprises and opportunities as we evolved PARASIM under the SBIR program,” says Cecy Pelz, Senior Specialist at Systems Technology, Inc. “It became sort of an invitation of great new opportunities and we began to tailor our simulation technology to the specific needs of other agencies.”

One of these spin-offs came in 2003 when STI was awarded a Phase I SBIR for Naval Air Systems Command and the US Army to begin development of its Fused Reality technology. The patented system combines real world video with interactive computer generated



Pilot Scott Howe performs a task with STI's Fused Reality system, which displays virtual objects such as runways or other aircraft.
// PHOTO COURTESY OF NASA //

environments to create a highly immersive training experience for practicing complex tasks such as landing, flying in formation with other aircraft, and aerial refueling. The user, or pilot, wears a special helmet equipped with an optical system that combines the real out-the-window view from a camera with computer-generated graphics of an airfield or another aircraft.

Nearly a decade later, researchers from NASA wanted to test the technology and conducted several evaluation flights, which will culminate in 2016. While NASA is interested in the Fused Reality system potentially for enhanced astronaut training, the Navy is investigating the use of the system for aircraft carrier landing training.

Although the multi-faceted company continued to create cutting edge technology across multiple sectors, engineers continued the development of PARASIM to where it is today. The system is used broadly throughout the US military for emergency egress and premeditated parachute training and continues to be a large source of revenue for the company. PARASIM also reduces costs and saves energy for its government clients by reducing the amount of live training required for military personnel.

To illustrate, it costs the US Air Force \$14,732 per flight hour to operate a C-130 which can be dramatically reduced when PARASIM is employed in the parachute training. The system recently received the SAFE Association's M.P. Koch Award, which is presented in recognition of those members of industry who have made significant contributions in the advancement of hardware for safety and survival applications.

Since the company's beginning in 1957, the founders of STI held an interest in the flying qualities of aircraft and the general questions of how human operators controlled vehicles. Much of STI's early research involved development of mathematical models of human operators to be combined with mathematical models of vehicles to understand handling qualities and manual control problems. The company gives a lot of credit to the SBIR program, for helping them to find their niche in simulation technologies and engineering consulting services.

"You can have a lot of great ideas, smart employees, and access to technology, but you still have to ask yourself where and what you should be developing to meet your clients' needs," explains Pelz. "With SBIR, the government says - this is what we want. This is what we are interested in, and please create a solution for us. We can then explore all of the opportunities to meet their needs. It takes some of the risk off the exploration."

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CECY PELZ
SENIOR SPECIALIST