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GL Studio Software Becomes the Next Generation Standard for the Army's AVCATT

Background:

The Aviation Combined Arms Tactical Trainer—the AVCATT—is a mobile virtual simulation training system designed to provide aviation personnel with the ability to conduct realistic, high intensity, task-loaded training exercises and mission rehearsals, simulating a full range of battlefield scenarios. Constructed on top of two trailers connected by a raised, covered platform, the AVCATT replicates a sophisticated command and control center with multiple manned workstations, a battlemaster control room, and other features. The AVCATT creates a mobile virtual war game environment to support individual, crew, collective and combined arms training. It is used by both active and reserve aviation units worldwide as an ongoing, affordable means to ensure combat readiness. Specifically, the AVCATT supports five different helicopter platforms including the AH-64A Apache, OH-58D Kiowa Warrior, UH-60 Blackhawk, CH-47D Chinook and the AH-64D Longbow.

L-3 Communications, the sixth largest defense company in the United States and the organization under contract with the U.S. Army to develop the AVCATT trainers, needed to enhance and upgrade the complex instrumentation used in the AVCATT. They turned to DiSTI and its GL Studio software to bring a new level of realism and interactivity to the trainer's capabilities.

Challenge:

The incumbent vendor's virtual avionics product, used to develop the previous instrumentation for the AVCATT, did not provide the sophisticated level of interactivity, performance and realism necessary for military personnel to get a premium training experience that would transition to a real-life battlefield environment. The new simulations also needed to be hosted on smaller and more cost effective Linux-based systems to provide

Executive Summary

Prime Contractor:	L-3 Communications
Government Client:	U.S. Army PEO-STRI
End System:	Aircraft Display Re-Architecture Program for the AVCATT (Aviation Combined Arms Tactical Trainer)
Engagement Overview:	Develop reconfigurable cockpit interfaces consisting of more than 60 instruments for five helicopter platforms, complete with high resolution imagery to provide soldiers with a more realistic training experience than currently installed.
Challenge:	Incumbent's displays did not deliver the high fidelity and performance needed to accurately portray real environmental conditions; required rapid development of new instrumentation to meet increased demands on training throughput and quality.
Solutions:	DiSTI's program management and systems engineering services, using its GL Studio software suite as the development tool
Results:	<ul style="list-style-type: none">• Development time five cockpits in 2 months using GL Studio• Unparalleled realism and immersion• Significant cost savings due to reusable software objects across all five aircraft platforms• Reduced negative training cues providing better training• Upgraded instruments seamlessly integrated with prime contractors simulators

more reliable interoperability across the local and wide area networks on which the systems functioned. Additionally, completing the instrumentation with the original tool was a two year process. With the Army's requirement for increased training throughput as well as a higher degree of learning and retention, such an extended timeframe was unacceptable; the new instrumentation elements had to be completed much faster to accommodate the Army's aggressive development schedule.

Solution:

L-3 Communications contracted with DiSTI to develop the new instrumentation using DiSTI's GL Studio toolkit for the rapid prototyping of virtual instrumentation. L-3's decision was based on DiSTI's experience and reputation in developing next generation virtual training environments for systems around the globe. GL Studio is a suite of powerful, intuitive object-oriented interface design tools that enable programmers in any industry to create state-of-the-art, reusable 2D or 3D graphical user interfaces. Interfaces apply to operating, maintaining or replicating even the most complex systems, including military/civil aircraft, cockpit displays, automotive dashboards, process/flow controls, and communications equipment. Specifically, DiSTI used its GL Studio toolkit to develop the reconfigurable cockpit

interfaces for all 5 helicopter platforms. The instruments were developed using high resolution photographs of the actual aircraft instrumentation leading to a final product that provided soldiers with a photo-realistic training experience. Roughly 60 instruments with 200 active parameters were created for the trainers in less than eight weeks.

Results:

Through GL Studio's object-oriented development environment and its ability to create reusable software objects (RSOs), the graphical elements for the trainer's instrumentation only had to be built once, and were available for reuse on the other helicopter platforms, saving the Army considerable development time.

Most importantly, the use of GL Studio instruments were ready for consumption by the prime contractor in only 2 months, generating a much faster return on investment and significantly decreasing development costs.

PEO-STRI began fielding the AVCATTs in September 2003 and will continue its rearchitecture program, relying on the reusability of the virtual simulation components developed by DiSTI's GL Studio software.



AVCATT instruments developed by DiSTI's professional services using GL Studio.