



Transition

SBIR Topic Number:

AF-01 076

Title:

High Resolution Visual System Development

Contract Number:

F33615-01-C-6003

Company Name:

SDS International,
Arlington, VA

Technical Project Office:

AFRL/Human Effectiveness Directorate

Transition Office:

Technology Integration Branch, Revolutionizing Training Division Training Systems Product Group

An example of Air Force supported SBIR technology that has been transitioned into an Air Force or other DoD system or subsystem or used by Air Force test ranges and facilities or maintenance depots.



Ultra High-resolution Image Generation and Display Systems for Effective Simulator Training

- Early in 2003 the new technology was integrated into AFRL's Human Effectiveness Distributed Mission Training (DMT) test bed facility. It has already been proven fully capable of supporting warfighter training
- SBIR contracts supported development of a low cost, high fidelity, PC-based image generation system capable of producing exceptional visuals, all for less than \$100,000 per system

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Air Force Requirements

One of the significant technologies being developed for Distributed Mission Training (DMT) is ultra high-resolution image generation and display systems. The field-of-view, brightness, and contrast of practically every visual training system available today is far less than what the pilot sees looking out of the real aircraft cockpit. Most importantly, the resolution of current out-the-window displays is at least an order-of-magnitude less than required. Because of this, current visual systems do not provide a pilot with adequate visual definition to identify other aircraft, ground vehicles, roads, and bridges at realistic tactical ranges or to properly assess their aspect angle. The Air Force requires reliable, easy to maintain visual system technologies with resolution, contrast, and fidelity required for realistic air-to-air and air-to-ground training in a DMT environment.

SBIR Technology

Using SBIR contracts, SDS International developed a low-cost, high fidelity PC-based software Image Generator (IG) capable of producing real world imagery for future ultra high resolution projectors and successfully integrated this technology into the important work of the AFRL/HEA DMT test bed facility. Each SDS International A Acuity™ DMT System provides state-of-the-art visuals simultaneously for eight visual channels and a sensor channel (Night Vision Goggle or Imaging Infrared) for less than \$100,000 and can produce ultra high-resolution images of up to 5120 x 4096 pixels. The system architecture SDS International developed also improves scene realism while dramatically reducing cost. The need for PC-based software, hardware, databases, system maintenance, and upgrades are decreased by as much as 90% vs. legacy systems.

Air Force Transition Payoff

Beginning in January 2003, AFRL began using SDS International's A Acuity™ PC-IG on one of four, full field-of-view F-16 simulators during a scheduled training research exercise with Air Force Air Combat Command pilots. The exercise demonstrated that a state-of-the-art PC-based IG, operating on commercial-off-the-shelf equipment, is fully capable of supporting warfighter training. This is an important accomplishment as it frees the Dept. of Defense from relying upon specialty, high-cost IG software and associated hardware to meet DMT needs in favor of PC-based IG software operating on commodity priced PCs. As a result, the government cannot only be hardware vendor independent, but also can upgrade hardware and improve capability at the same rapid rate as experienced in the commercial PC marketplace. Further, this PC revolution does not reduce fidelity, rather, it actually increases fidelity with high-resolution, photo-realistic, geo-specific terrains, realistic weather, lighting and special effects, all at significantly lower costs.



U.S. AIR FORCE

SBIR

AF SBIR Program Manager
AFRL/XPTT
1864 4th Street,
Room 1, Building 15
Wright-Patterson AFB, OH 45433

AF SBIR Program Manager: Steve Guilfoos
e-mail: stephen.guilfoos@wpafb.af.mil
Website: www.sbirstrmall.com

DSN Fax: 785-2329
T: (800) 222-0336
F: (937) 255-2329

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