

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 3 - Advanced Technology Development				PE NUMBER AND TITLE 0603227F Personnel, Training, and Simulation Technology				PROJECT 2743		
COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
2743 Advanced Training/Force Management	5,655	6,595	4,827	6,538	7,905	8,645	5,829	5,949	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0
<p>(U) A. <u>Mission Description:</u> This Advanced Technology Development program develops and demonstrates technologies that will result in improved warfighter readiness. Develops, demonstrates, and evaluates technologies for Distributed Mission Training (DMT) including realistic, effective, and affordable synthetic combat environments, technologies for long distance networking to enhance joint-Service training, visual displays for real-time and post-mission debrief, and instructional strategies to support warfighter training in a joint synthetic battlespace. Provides a technology testbed for examining warfighter skills, cognitive functions, and behaviors contributing to combat readiness. Develops models to support aircrew, space, and information operations, performance measurement systems for air, space and information warfare, and tools for mission planning, rehearsal, execution, and force protection in a distributed mission environment. Develops and demonstrates technologies necessary to provide realistic training for night time warfighting. Develops and demonstrates computer-based intelligent tutoring technology for representative tasks in high technology jobs, and software to enable Air Force training developers to rapidly and affordably build intelligent computer assisted training systems which continually interact with students for effective individualized training. Develops and demonstrates information management technology for the warfighter at the unit level. Work concentrates on aircrew, space, and information dominance domains.</p>										

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<p>(U) <u>FY 1998 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$1,242 Developed, demonstrated, and evaluated technologies to create Distributed Mission Training (DMT) capabilities including a four-aircraft testbed with a mobile, interactive, air and ground threat environment, and a simulated command and control module, for use as a multi-Service, nationwide air and ground crew training tool. - (U) \$1,086 Developed, demonstrated, and evaluated simulator visual technologies. Continued development of high resolution microlaser projector for visual displays with "real world" resolution. Incorporated scene imagery from actual medium and high altitude imagery on visual displays for simulator/training systems and developed multi-level security manager (MLM) to allow for incorporating different levels of classified information to be used simultaneously on simulation/training systems. - (U) \$2,126 Developed and demonstrated technologies to enable and enhance Night Vision Goggle (NVG) training and rehearsal for aircrews by demonstrating proof-of-concept enhanced real-time NVG simulation for combat mission training, including special effects such as halos, dynamic noise, and goggle gain response. Demonstrated low-cost light emitting diode (LED)-based interim cockpit lighting compatible with NVGs in fighter aircraft. - (U) \$1,201 Developed, demonstrated, and evaluated computer-based training technologies and evaluated knowledge representation and student modeling technologies. Initiated migration of successful techniques to the JAVA computer language for enhanced deployability. - (U) \$5,655 Total <p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$1,200 Develop, demonstrate, and evaluate technologies to create DMT capabilities including electronic combat environment tools to represent threat systems and to allow for a more accurate representation of the battlespace in the DMT environment. Incorporate Semi-Automated Forces (SAF) and Synthetic Theater of War (STOW) to give a more realistic representation of the combat environment and develop a certified dynamic threat system which incorporates representative real-world threat systems. - (U) \$ 956 Develop, demonstrate, and evaluate simulator visual technologies including a high-resolution laser projection system for more accurately portraying friendly and threat airborne systems. - (U) \$2,070 Develop and demonstrate technologies to enable and enhance NVG training and rehearsal for aircrews by developing simulation requirements for physics-based, low-cost, deployable real-time simulation of NVG imagery to support mission training and provide technical support to Air Force and DoD for NVG design, acquisition, flight test, lighting compatibility, mishap investigations, and training syllabus development. - (U) \$2,165 Develop, demonstrate, and evaluate computer-based training technologies and evaluate knowledge representation and student modeling technologies. Evaluate adaptive instruction authored by targeted end users. Incorporate interconnection technology including high level architecture requirements into the virtual and constructive training systems, and advances in display, networking, and computing technology into brief/debrief stations to support squadron-level briefing room and training capability. - (U) \$ 204 Identified as a source for SBIR. 		
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– (U) \$6,595	Total	
(U) <u>FY 2000 (\$ in Thousands):</u>		
– (U) \$1,788	Develop, demonstrate, and evaluate technologies to create Distributed Mission Training (DMT) capabilities including physics-based modeling for constructive simulations to more accurately represent real-world systems and representation technologies including a virtual threat cockpit to allow for human-in-the-loop training scenarios. Develop real-time intelligence fusion into the DMT battlespace environment to simulate real-time intelligence updates and develop technologies to include weapons controller interfaces and wing command and control system to incorporate live ground segments.	
– (U) \$ 639	Develop, demonstrate, and evaluate simulator visual technologies including affordable, increased performance, personal computer-based image generation systems to allow for higher resolution, more realistic visual displays in the simulation systems.	
– (U) \$1,500	Develop and demonstrate technologies to enable and enhance Night Vision Goggle (NVG) training and rehearsal for aircrews by demonstrating wide area, networked multi-ship, high fidelity NVG combat mission simulation including a lunar illumination model as well as dynamic shadowing and illumination effects associated with combat related light sources (fires, explosions, flares). Develop perceptual training guidelines for distance estimation, scanning techniques, task management techniques, and maintenance of situational awareness and spatial orientation when wearing NVGs.	
– (U) \$ 900	Develop guidelines and techniques for incorporating force-on-force modeling into DMT for training force protection units.	
– (U) \$4,827	Total	
(U) <u>FY 2001 (\$ in Thousands):</u>		
– (U) \$1,211	Develop, demonstrate, and evaluate technologies to create DMT capabilities including technologies to cue human sensory systems to changes in the flying environment and information technologies to integrate live/virtual/constructive interfaces.	
– (U) \$2,027	Develop, demonstrate, and evaluate simulator visual technologies including smaller visual display systems to allow for mobile, realistic training at forward basing locations and including human-computer interfaces to incorporate more flexible and realistic combat training scenarios.	
– (U) \$1,500	Develop and demonstrate technologies to enable and enhance NVG training and rehearsal for aircrews involving operational aircraft and helicopter aircrews, to evaluate measures of training effectiveness, mission performance and transfer of training from simulator to the aircraft. Conduct field evaluation of NVG training techniques to include distance estimation for helicopter, formation and aerial refueling, and combat maneuvering.	
– (U) \$1,800	Develop advanced training technologies with force-on-force capabilities to train force protection units to protect against terrorist, nuclear, biological, and chemical threats.	
– (U) \$6,538	Total	
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<p>(U) B. Budget Activity Justification: This program is in Budget Activity 3, Advanced Technology Development, since it develops and demonstrates technologies for new system developments that have military utility and address warfighter needs.</p>		

