RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

DATE: February 2003

BUDGET ACTIVITY: 02 - Applied Research

PE NUMBER AND TITLE: 0602805F Dual Use Science & Technology

PROJECT: 4770

	COST ($ in Thousands)	FY 2002 Actual	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	Cost to Complete	Total Cost
4770	Dual Use Science and Technology (S&T)	9,945	10,395	10,586	8,864	8,969	11,158	11,319	11,471	Continuing	TBD
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

This program seeks to leverage industry investments with interests in advanced technologies of mutual advantage to the Air Force and the commercial sector. A key objective of this program is for the Air Force to stimulate the development of dual use technologies so as to provide greater access to commercially developed technologies and to promote more affordable defense systems that maintain battlefield superiority. A critical component of the program is the cost-sharing requirement from industry and the Air Force. The cooperative funding assures joint commitment to the transition and dual use development efforts of successful demonstrated technologies. Specific projects are determined through annual competitive solicitation(s). Technology areas considered include advanced materials and manufacturing; sensors; advanced propulsion, power, and fuel efficiency; information and communications technologies; and weapon systems sustainment.

(U) FY 2002 ($ in Thousands)

(U) $0 Accomplishments/Planned Program

(U) $2,579 Developed information technologies to help ensure the collection, dissemination, security, accuracy, and presentation of information to U.S. military decision-makers and corresponding commercial industry sectors. Technology areas considered included the gathering of pertinent information; providing for the fusion, accuracy, security, and transmission of information; and presenting the information in a consistent and easily understood manner to a decision maker.

(U) $2,039 Initiated development of innovative techniques and processes for non-destructive inspection, evaluation, and maintenance of Air Force and commercial aircraft assets. These techniques and processes are relevant to enable critical maintenance and repair decisions by depot and flight line maintenance personnel. The focus was on refinement and optimization of inspection, evaluation, and prediction techniques for maintenance and troubleshooting. Technology areas included inspection, evaluation, and maintenance of avionics, propulsion, structures, flight controls, and expendables such as fuels, lubricants, and hydraulic fluid; application of these new techniques to in-flight monitoring and early warning indicators; and automated and/or autonomous operation of inspection and evaluation techniques.

(U) $1,952 Continued to develop affordable, robust manufacturing processing and fabrication techniques for metals and special materials critical to defense weapon system applications. The technology also supported commercial applications with the potential to significantly impact the cost and performance of future aircraft, missiles, space systems, or other defense-related applications. Technology areas considered included more efficient and affordable manufacturing processes/components, part count reduction techniques, improved yields, improved process/dimensional

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(U) A. Mission Description Continued

(U) FY 2002 ($ in Thousands) Continued

control, reduced lead times, improved inspection techniques, and advanced prototyping techniques.

(U) $1,778 Sought to develop and demonstrate advanced power generation, power conditioning, energy conversion, energy storage, thermal management and power distribution component and system technologies for space applications. Military and commercial applications included satellites, energy storage, power distribution and conditioning, and thermal management systems. The focus was on enabling power generation improvements in efficiency, volume, mass, life, and reliability. The goal was to demonstrate significant improvements in size, weight, and reliability over state-of-the-art systems and/or enable new concepts.

(U) $1,597 Advanced development and demonstration of advanced power generation, power conditioning, energy conversion, energy storage, thermal management, and power distribution technologies for More Electric Aircraft military and civilian use. Applications included commercial aircraft, inhabited and uninhabited aircraft, and airborne directed energy weapons. Technologies of interest included aircraft power components and systems that demonstrated significant improvements in size, weight, and reliability over state-of-the-art systems and/or enable new concepts. The focus was on improvements in reliability, maintainability, commonality, and supportability. Technology areas considered included concepts to replace hydraulic, mechanical, and pneumatic power subsystems and their costly logistics support; compact high power generation and conditioning; and high rate energy storage.

(U) $9,945 Total

(U) FY 2003 ($ in Thousands)

(U) $0 Accomplishments/Planned Program

(U) $2,079 Advance materials and manufacturing technologies that will reduce the life cycle cost while enhancing the capabilities of both Air Force, as well as commercial, air and space vehicles and launch systems. Technology areas of interest include: non-destructive/non-intrusive evaluation techniques; smart and adaptive skins; corrosion resistant coatings; micro- and nano-scale electronics; durable, lightweight materials for space launch; and agile materials for use in force protection.

(U) $2,079 Enable affordable advanced sensors technologies that have application to commercial and military air and space platforms. Technology areas of interest include: timely, high quality, precision imaging; sensitive, ambient environment electromagnetic (i.e., infrared) detection; and high-speed, precision temporal, spatial, and attitude sensors and controllers.

(U) $2,079 Develop advanced propulsion, power, and fuel efficiency technologies to improve the performance, increase the life, and reduce the cost of military and commercial air and space operations. Technology areas of interest include: performance and emissions of airbreathing and rocket propulsion systems; advanced gas turbine combustion and blades; electric propulsion alternatives; energy processing, storage, and conversion; lasers; and smart engine health monitoring techniques.

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(U) A. Mission Description Continued

(U) FY 2003 ($ in Thousands) Continued

(U)	$2,079	Further advanced information and communication technologies to enhance the collection, processing, dissemination, security, accuracy, and presentation of information to U.S. and coalition military decision-makers and corresponding commercial industry sectors. Technology areas of interest include: collecting, synthesizing, and encoding pertinent information; securing the high-speed and reliable fusion, accuracy, security, and transmission of information; and presenting the appropriate information in an efficient, timely, consistent, and easily understood manner.
(U)	$2,079	Enhance weapon systems sustainment technologies that extend the life and improve the performance, efficiency, reliability, and maintainability of both Air Force and commercial air and space systems. Technology areas of interest include: avionics; materials fatigue and fracture; corrosion; cost-effective techniques for non-invasive, real-time monitoring of system health/performance; and associated environmental impacts.
(U)	$10,395	Total

(U) FY 2004 ($ in Thousands)

(U)	$0	Accomplishments/Planned Program
(U)	$1,762	Continue development of advanced information and communication technologies to enhance the collection, processing, dissemination, security, accuracy, and presentation capabilities of military and commercial information systems. Technology areas of interest include: collecting, synthesizing, and encoding pertinent information; securing high-speed and reliable fusion, accuracy, security, and transmission of information; and presenting relevant information in an efficient, timely, consistent, and easily understood manner.
(U)	$1,728	Further the design and development of affordable advanced sensors technologies aimed at enhancing the capabilities of military and commercial air and space platforms. Technology areas of interest include: real-time, high-resolution, precision imaging; sensitive, ambient environment electromagnetic (e.g., infrared) detection; and high-speed, precision temporal, spatial, and attitude sensors and controllers.
(U)	$2,708	Further develop advance materials and manufacturing technologies that will enhance the capability, performance, and durability of Air Force, as well as commercial, air and space systems while reducing the life cycle cost. Technology areas of interest include: smart and adaptive skins; corrosion resistant and genetically designed coatings; non-destructive/non-intrusive evaluation techniques; nano-scale electronics; specialized materials for space launch; and agile materials for use in force protection.
(U)	$2,659	Advance novel propulsion, power, and fuel efficiency technologies development to improve the capability, increase the life, and reduce the cost of military and commercial air and space operations. Technology areas of interest include: performance and emissions of airbreathing and rocket propulsion systems; advanced gas turbine combustion and blades; electric propulsion alternatives; energy processing, storage, and conversion; lasers; and smart engine health monitoring techniques.
(U)	$1,729	Prolong development of weapon systems sustainment technologies that enhance the performance capabilities, reliability, and maintainability while extending the life of both Air Force and commercial air and space systems. Technology areas of interest include: avionics; materials

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(U) A. Mission Description Continued

(U) FY 2004 ($ in Thousands) Continued

fatigue and fracture; corrosion; cost-effective techniques for non-invasive, real-time monitoring of system health/performance; and associated environmental impacts.

(U) $10,586 Total

(U) B. Budget Activity Justification

This program is in Budget Activity 2, Applied Research, since it develops and determines the technical feasibility and military utility of evolutionary and revolutionary technologies.

(U) C. Program Change Summary ($ in Thousands)

		FY 2002	FY 2003	FY 2004	Total Cost
(U)	Previous President's Budget	10,316	10,626	10,820	
(U)	Appropriated Value	10,417	10,626		
(U)	Adjustments to Appropriated Value				
	a. Congressional/General Reductions	-101	-112		
	b. Small Business Innovative Research	-322			
	c. Omnibus or Other Above Threshold Reprogram		-119		
	d. Below Threshold Reprogram				
	e. Rescissions	-49			
(U)	Adjustments to Budget Years Since FY 2003 PBR			-234	
(U)	Current Budget Submit/FY 2004 PBR	9,945	10,395	10,586	TBD

(U) Significant Program Changes:

Not Applicable.

(U) D. Other Program Funding Summary ($ in Thousands)

(U) Related Activities:

(U) PE 0601102F, Defense Research Sciences.

(U) PE 0602102F, Materials.

(U) PE 0602201F, Aerospace Flight Dynamics.

(U) PE 0602202F, Human Effectiveness.

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(U) D. Other Program Funding Summary ($ in Thousands)

(U) PE 0602203F, Aerospace Propulsion.
(U) PE 0602204F, Aerospace Sensors.
(U) PE 0602500F, Multi-Disciplinary Space Technology.
(U) PE 0602601F, Space Technology.
(U) PE 0602602F, Conventional Munitions.
(U) PE 0602605F, Directed Energy Technology.
(U) PE 0602702F, Command Control and Communications.
(U) PE 0603112F, Advanced Materials for Weapon Systems.
(U) PE 0603203F, Advanced Aerospace Sensors.
(U) PE 0603211F, Aerospace Structures.
(U) PE 0603216F, Aerospace Propulsion and Power Technology.
(U) PE 0603231F, Crew Systems and Personnel Protection Technology.
(U) PE 0603270F, Electronic Combat Technology.
(U) PE 0603401F, Advanced Spacecraft Technology.
(U) PE 0603500F, Multi-Disciplinary Advanced Development Space Technology.
(U) PE 0603601F, Conventional Weapons Technology.
(U) PE 0603605F, Advanced Weapons Technology.
(U) PE 0603789F, C3I Advanced Development.
(U) This program has been coordinated through the Reliance process to harmonize efforts and eliminate duplication.

(U) E. Acquisition Strategy

Not Applicable.

(U) F. Schedule Profile

(U) Not Applicable.