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

DATE: June 2001

BUDGET ACTIVITY: 02 - Applied Research

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

PROJECT: 4770

COST ($ in Thousands)		FY 2000 Actual	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
4770	Dual Use Science and Technology (S&T)	9,498	10,051	10,417	10,652	10,886	11,126	11,360	11,600	Continuing	TBD
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

Note: FY 2003-FY 2007 budget numbers do not reflect the DoD strategy review results.

(U) A. Mission Description

The Dual Use Science and Technology program seeks to leverage industry investments in advanced technologies that are mutually advantageous to the Air Force and industry. One of the program's objectives is to establish a tool for the Air Force to stimulate the development of dual use technologies to provide greater access to commercial technologies, and lead to affordable defense systems that maintain battlefield superiority. A key component of the program is the cost-sharing requirement from both industry and the Air Force, which affirms commitment to the development effort. Specific projects are determined through annual competitive solicitation(s). A second objective is to use the FY 1997 Defense Authorization Act Section 804, Other Transactions Authority, as part of the Dual Use Science and Technology program to educate the Air Force Science and Technology (S&T) workforce in non-traditional or commercial contracting practices. Technology areas considered include advanced materials and manufacturing, affordable sensors, advanced propulsion, power and fuel efficiency, information and communications systems, and weapon systems sustainment.

(U) FY 2000 ($ in Thousands)

(U) $3,942 Developed air vehicle technologies that extend the life and improve the performance, effectiveness, and reliability of both Air Force and commercial fixed wing air vehicles. Technology areas included improving flight control, lightweight structures, common electronics, and vehicle subsystems. Specific projects included developing ceramic matrix composites for engine exhaust sections, developing and commercializing high power diodes capable of high temperature operation, and developing low-cost, revolutionary alloy steels.

(U) $4,114 Developed information and sensor technologies that improve the capability of aerospace command and control, information dominance, and battlefield management, as well as enhance commercial communications and awareness. Technology areas included intelligent information systems, communication systems, information fusion, and collaborative environment development. Specific projects included development of low-cost Continuous Transverse Stub array antennas, and smart imaging sensors for application to military operations and civilian navigation.

(U) $1,442 Developed space technologies that will reduce the cost and improve the capability of both Air Force and commercial space vehicles and launch systems. Technology areas included improved space vehicle survivability, space vehicle control, and space-based sensing. Specific projects included development of flight-ready thermal protection systems for military and commercial space vehicles, development of novel batteries for space applications, and development and commercialization of design software for space components.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001	
BUDGET ACTIVITY 02 - Applied Research	PE NUMBER AND TITLE 0602805F Dual Use Science & Technology	PROJECT 4770

(U) A. Mission Description Continued

(U) FY 2000 ($ in Thousands) Continued

(U) $9,498 Total

(U) FY 2001 ($ in Thousands)

(U) $2,774 Developed advance materials and manufacturing technologies that will reduce the cost and improve the capability of both Air Force and commercial air and space vehicles and launch systems. Technology areas considered included: growth processes for wide bandgap semiconductor materials such as Silicon Carbide (SiC), Gallium Nitride (GaN), and related materials; superior ceramic matrix composites (CMCs); advanced metal matrix composites (MMCs) and intermetallics materials for durable, maintainable vehicles; composite material structures based upon low-cost preforming, infusion, and curing; and inflatable membrane solar concentrators for high powered (>100kW) military and commercial satellites.

(U) $2,576 Developed affordable advanced sensors technologies that can be applied to both commercial and military space and airborne systems to provide a complete and timely picture of the battlespace, enable a timely precision response, and enhance the warfighter's survivability, as well as enhance commercial telecommunications, imaging, and surveying. Technology areas considered included: antennas that are conformal in shape, cost-effective to manufacture, operate over a very wide frequency bandwidth, and are polarization diverse; laser radar (LADAR) to provide precise and timely topographical maps for both commercial and military purposes; innovative focal plane arrays (FPAs) for LADAR; and navigation aids, including inertial navigation components and satellite-based global positioning.

(U) $1,727 Developed advanced propulsion, power, and fuel efficiency technologies that improve the performance, increase life, and reduce emissions of airbreathing and rocket propulsion systems. Technology areas considered include: advanced gas turbine combustion; cost-effective, long life, turbine blades; mitigation of particulate formation in airbreathing and rocket propulsion systems; advanced common core compressors; lightweight rocket nozzles; enhanced fuel-air mixing and jet penetration techniques; and smart engine health monitoring techniques.

(U) $1,487 Developed information and communications systems technologies that enhance human-vehicle interactions, improve the capability of aerospace command and control, advance information dominance and battlefield management, as well as enhance commercial communications and awareness. Technology areas considered included: automation of logistics and equipment failure reporting; information recovery; intelligent information systems; information fusion; intelligent image correlators; smart data processing; and web-based virtual consortiums for modeling and simulation research/application.

(U) $1,487 Developed weapon systems sustainment technologies that extend the life and improve the performance, effectiveness, and reliability of both Air Force and commercial air and space vehicles. Technology areas considered include: computational methods for assembling and validating system maintenance instructions; on-board aircraft generation and liquefaction of oxygen and nitrogen; structural integration of subsystems to reduce weight and cost; design tools; and cost-effective techniques for monitoring system health.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001
BUDGET ACTIVITY 02 - Applied Research	PE NUMBER AND TITLE 0602805F Dual Use Science & Technology
PROJECT 4770	

(U) A. Mission Description Continued

(U) FY 2001 ($ in Thousands) Continued

(U) $10,051 Total

(U) FY 2002 ($ in Thousands)

(U) $2,617 Develop information technologies to ensure the collection, dissemination, security, accuracy, and presentation of information to U.S. military decision-makers and corresponding commercial industry sectors. Technology areas considered include 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) $2,600 Develop 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 is on refinement and optimization of inspection, evaluation, and prediction techniques for maintenance and troubleshooting. Technology areas include 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) $2,600 Develop affordable, robust manufacturing processing and fabrication techniques for metals and special materials critical to defense weapon system applications. The technology will also support commercial applications and significantly impact the cost and performance of future aircraft, missiles, space systems, or other defense related applications. Technology areas considered include more efficient and affordable manufacturing processes/components, part count reduction techniques, improved yields, improved process/dimensional control, reduced lead times, improved inspection techniques, and advanced prototyping techniques.

(U) $1,300 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 include satellites, energy storage, power distribution and conditioning, and thermal management systems. The focus is on enabling power generation improvements in efficiency, volume, mass, life, and reliability. The goal is to demonstrate significant improvements in size, weight, and reliability over state-of-the-art systems and/or enable new concepts.

(U) $1,300 Develop and demonstrate advanced power generation, power conditioning, energy conversion, energy storage, thermal management, and power distribution technologies for More Electric Aircraft military and civilian use. Applications include commercial aircraft, inhabited and uninhabited aircraft, and airborne directed energy weapons. Technologies of interest include aircraft power components and systems that demonstrate significant improvements in size, weight, and reliability over-state-of-the-art systems and/or enable new concepts. The focus is on improvements in reliability, maintainability, commonality, and supportability. Technology areas considered include concepts to replace

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE: June 2001
BUDGET ACTIVITY: 02 - Applied Research	PE NUMBER AND TITLE: 0602805F Dual Use Science & Technology	PROJECT: 4770

(U) A. Mission Description Continued

(U) FY 2002 ($ in Thousands) Continued

hydraulic, mechanical and pneumatic power subsystems and their costly logistics support; compact high power generation and conditioning; and high rate energy storage.

(U) $10,417 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 2000	FY 2001	FY 2002	Total Cost
(U)	Previous President's Budget (FY 2001 PBR)	9,879	10,144	10,358	
(U)	Appropriated Value	10,000	10,144		
(U)	Adjustments to Appropriated Value				
	a. Congressional/General Reductions	-1			
	b. Small Business Innovative Research	-236			
	c. Omnibus or Other Above Threshold Reprogram				
	d. Below Threshold Reprogram	-160			
	e. Rescissions	-105	-93		
(U)	Adjustments to Budget Years Since FY 2001 PBR			59	
(U)	Current Budget Submit/FY 2002 PBR	9,498	10,051	10,417	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.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE June 2001

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
02 - Applied Research	0602805F Dual Use Science & Technology	4770

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

(U) PE 0602203F, Aerospace Propulsion.
(U) PE 0602204F, Aerospace Sensors.
(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 0602805N, Dual Use Science and Technology (S&T).
(U) PE 0602805A, Dual Use Science and Technology (S&T).
(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 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.