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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 2000		
BUDGET ACTIVITY 02 - Applied Research				PE NUMBER AND TITLE 0602805F Dual Use Science & Technology				PROJECT 624770		
COST (\$ in Thousands)		FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
624770	Dual Use Science and Technology (S&T)	9,451	9,879	10,144	10,358	10,581	10,804	11,030	Continuing	TBD
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0
<p>(U) <u>A. Mission Description</u> This program allows the Air Force to leverage industry investments in advanced technologies that are mutually advantageous to both 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 that will provide greater access to commercial technologies, and will result in 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 FY 1997 Defense Authorization Act Section 804, Other Transactions Authority, as part of the Dual Use S&T program to educate the Air Force S&T workforce in non-traditional or commercial contracting practices. Technology development areas considered include advanced materials and manufacturing, affordable sensors, advanced propulsion, power and fuel efficiency, information and communications systems, and weapons systems sustainment.</p>										
<p>(U) <u>FY 1999 (\$ in Thousands)</u></p>										
(U)	\$3,325	Developed air vehicle technologies that extend the life and improve the performance of both Air Force and commercial fixed wing air vehicles. Areas of research included improving flight control, lightweight structures, common electronics, and vehicle subsystems.								
(U)	\$3,200	Developed information technologies that improve the capability of both aerospace command and control, and commercial communications and awareness. Areas of research included intelligent information systems, communication systems, information fusion, and collaborative environment development.								
(U)	\$2,926	Developed space technologies that will reduce the cost and improve the capability of both Air Force and commercial space vehicles and launch systems. Areas of research included improved space vehicle survivability, space vehicle control, and space-based sensing.								
(U)	\$9,451	Total								
<p>(U) <u>FY 2000 (\$ in Thousands)</u></p>										
(U)	\$4,100	Develop 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 include improving flight control, lightweight structures, common electronics, and vehicle subsystems. Specific projects include 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)	\$4,279	Develop information and sensor technologies that improve the capability of aerospace command and control, information dominance, and								
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(U) <u>A. Mission Description Continued</u>		
(U) <u>FY 2000 (\$ in Thousands) Continued</u>		
	battlefield management, as well as enhance commercial communications and awareness. Technology areas include intelligent information systems, communication systems, information fusion, and collaborative environment development. Specific projects include development of low-cost Continuous Transverse Stub array antennas, and smart imaging sensors for application to military operations and civilian navigation.	
(U) \$1,500	Develop space technologies that will reduce the cost and improve the capability of both Air Force and commercial space vehicles and launch systems. Technology areas include improved space vehicle survivability, space vehicle control, and space-based sensing. Specific projects include 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.	
(U) \$9,879	Total	
(U) <u>FY 2001 (\$ in Thousands)</u>		
(U) \$2,800	Develop 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 include: 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) \$2,600	Develop affordable advanced sensors technology 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 include: 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) \$1,744	Develop 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) \$1,500	Develop 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 include: automation of logistics and equipment failure reporting; information recovery; intelligent	
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<p>(U) <u>A. Mission Description Continued</u></p> <p>(U) <u>FY 2001 (\$ in Thousands) Continued</u></p> <p style="padding-left: 40px;">information systems; information fusion; intelligent image correlators; smart data processing; and web-based virtual consortiums for modeling and simulation research/application.</p> <p>(U) \$1,500 Develop 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.</p> <p>(U) \$10,144 Total</p> <p>(U) <u>B. Budget Activity Justification</u></p> <p>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.</p> <p>(U) <u>C. Program Change Summary (\$ in Thousands)</u></p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;"></th> <th style="text-align: center;"><u>FY 1999</u></th> <th style="text-align: center;"><u>FY 2000</u></th> <th style="text-align: center;"><u>FY 2001</u></th> <th style="text-align: center;"><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>(U) Previous President's Budget (FY 2000 PBR)</td> <td style="text-align: center;">9,961</td> <td style="text-align: center;">17,927</td> <td style="text-align: center;">17,841</td> <td></td> </tr> <tr> <td>(U) Appropriated Value</td> <td style="text-align: center;">10,000</td> <td style="text-align: center;">10,000</td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Appropriated Value</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">a. Congressional/General Reductions</td> <td style="text-align: center;">-39</td> <td style="text-align: center;">-1</td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">b. Small Business Innovative Research</td> <td style="text-align: center;">-336</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">c. Omnibus or Other Above Threshold Reprogram</td> <td></td> <td style="text-align: center;">-54</td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">d. Below Threshold Reprogram</td> <td style="text-align: center;">-121</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">e. Rescissions</td> <td style="text-align: center;">-53</td> <td style="text-align: center;">-66</td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">f. Other</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Budget Years Since FY 2000 PBR</td> <td></td> <td></td> <td style="text-align: center;">-7,697</td> <td></td> </tr> <tr> <td>(U) Current Budget Submit/FY 2001 PBR</td> <td style="text-align: center;">9,451</td> <td style="text-align: center;">9,879</td> <td style="text-align: center;">10,144</td> <td style="text-align: center;">TBD</td> </tr> </tbody> </table> <p>(U) <u>Significant Program Changes:</u> Changes to this program since the previous President's Budget are due to a re-evaluation of priorities within the Science and Technology (S&T) Program.</p>				<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>	(U) Previous President's Budget (FY 2000 PBR)	9,961	17,927	17,841		(U) Appropriated Value	10,000	10,000			(U) Adjustments to Appropriated Value					a. Congressional/General Reductions	-39	-1			b. Small Business Innovative Research	-336				c. Omnibus or Other Above Threshold Reprogram		-54			d. Below Threshold Reprogram	-121				e. Rescissions	-53	-66			f. Other					(U) Adjustments to Budget Years Since FY 2000 PBR			-7,697		(U) Current Budget Submit/FY 2001 PBR	9,451	9,879	10,144	TBD
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<p>(U) <u>D. Other Program Funding Summary (\$ in Thousands)</u></p> <p>(U) Related Activities:</p> <p>(U) PE 0602102F, Materials.</p> <p>(U) PE 0602201F, Aerospace Flight Dynamics.</p> <p>(U) PE 0602202F, Human Effectiveness.</p> <p>(U) PE 0602203F, Aerospace Propulsion.</p> <p>(U) PE 0602204F, Aerospace Sensors.</p> <p>(U) PE 0602601F, Space Technology.</p> <p>(U) PE 0602602F, Conventional Munitions.</p> <p>(U) PE 0602605F, Directed Energy Technology.</p> <p>(U) PE 0602702F, Command Control and Communications.</p> <p>(U) PE 0602805N, Dual Use Science and Technology (S&T).</p> <p>(U) PE 0602805A, Dual Use Science and Technology (S&T).</p> <p>(U) This project is coordinated through the Reliance process to harmonize efforts and eliminate duplication.</p> <p>(U) <u>E. Acquisition Strategy</u> Not Applicable.</p> <p>(U) <u>F. Schedule Profile</u> Not applicable.</p>		
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