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

DATE: February 2002

BUDGET ACTIVITY: 03 - Advanced Technology Development

PE NUMBER AND TITLE: 0603202F Aerospace Propulsion Subsystems Integration

PROJECT: 668A

COST ($ in Thousands)		FY 2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
668A	Aircraft Propulsion Subsystem Integration	33,267	0	0	0	0	0	0	Continuing	TBD
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0

Note: In FY 2002, efforts transferred to PE 0603216F, Project 4921, in order to align projects with the Air Force Research Laboratory organization.

(U) A. Mission Description

This project develops and demonstrates gas turbine propulsion technologies applicable to a broad range of aircraft. The Aircraft Propulsion Subsystem Integration (APSI) project includes demonstrator engines such as the Joint Technology Demonstrator Engine for manned systems and the Joint Expendable Turbine Engine Concept for unmanned air vehicle and cruise missile applications. The APSI demonstrator engines integrate the core (high-pressure spool) technology developed under the Advanced Turbine Engine Gas Generator with the engine (low-pressure spool) technology such as fans, turbines, engine controls, and exhaust nozzles. This project also focuses on integration aspects of inlets, nozzles, engine/airframe compatibility, and low-observable technologies. APSI will provide enabling technology for increasing aircraft range and cruise speed with lower specific fuel consumption; surge power for successful engagements; high sortie rates with reduced maintenance; reduced life cycle cost; and improved survivability resulting in increased mission effectiveness. The APSI project supports the goals of the Integrated High Performance Turbine Engine Technology (IHPTET) program, which is focused on doubling 1987 turbine engine propulsion capabilities by 2005 while reducing cost of ownership. The IHPTET program provides continuous technology transition for military turbine engine upgrades and derivatives, and has the added dual-use benefit of enhancing the United States turbine engine industry's international competitiveness. Technology innovations developed in this project are applicable to current and future Air Force turbine engines.

(U) FY 2001 ($ in Thousands)

(U) $5,103 Designed, fabricated, and demonstrated durability and integration technologies for turbofan/turbojet engines for improved supportability and affordability of current and future Air Force aircraft. Completed engine testing in support of the national High Cycle Fatigue (HCF) program, including fan blade damage tolerance, frangible bearings, prognostics and health management, and turbine engine explosive blade out concept demonstration.

(U) $21,246 Designed, fabricated, and tested advanced component technologies for improved performance and fuel consumption of turbofan/turbojet engines for fighters, bombers, and transports. Fabricated a full-demonstrator engine test fixed inlet guide vanes and moderate aspect ratio rotor, Integrally Bladed Rotor repair, fan rim damper, HCF mistuning technologies, vaneless counterrotating high/low pressure turbine, probabilistic

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(U) A. Mission Description Continued

(U) FY 2001 ($ in Thousands) Continued

rotor system design, gamma titanium aluminide low pressure turbine coverplate, sprayform cast hardware, and Ceramic Matrix Composite technologies. Continued advanced engine designs for High Cycle Fatigue robust front frame, two-stage forward swept fan, tiled low pressure turbine (LPT) blade, uncooled Ceramic Matrix Composite (CMC) LPT blade, and model-based control with diagnostics. All of these technologies are applicable to a significant part of the current Air Force inventory as well as future turbine engines.

(U) $4,512 Designed, fabricated, and tested advanced component technologies for improved performance, durability, and affordability of engines for missile and uninhabited air vehicle applications. Continued design of organic matrix composite fan, high stage loading splittered fan, uncooled ceramic high/low pressure turbine, and slinger combustor.

(U) $1,926 Designed and initiated fabrication of integrated propulsion designs to demonstrate performance and durability of advanced hypersonic propulsion concepts in support of Defense Advanced Research Projects Agency missile demonstration.

(U) $480 Designed a low volume, high temperature and pressure combustor. Evaluated performance in cruise missile or uninhabited air vehicle applications.

(U) $33,267 Total

(U) FY 2002 ($ in Thousands)

(U) $0 Efforts moved to PE 0603216F, Project 4921.

(U) $0 Total

(U) FY 2003 ($ in Thousands)

(U) $0 No activity.

(U) $0 Total

(U) B. Budget Activity Justification

This program is in Budget Activity 3, Advanced Technology Development, since it develops and demonstrates technologies for existing system upgrades and/or new system developments that have military utility and address warfighter needs.

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

		FY 2001	FY 2002	FY 2003	Total Cost
(U)	Previous President's Budget	34,619	0	0	
(U)	Appropriated Value	34,940	0		
(U)	Adjustments to Appropriated Value				
	a. Congressional/General Reductions				
	b. Small Business Innovative Research	-820			
	c. Omnibus or Other Above Threshold Reprogram				
	d. Below Threshold Reprogram	-532			
	e. Rescissions	-321			
(U)	Adjustments to Budget Years Since FY 2002 PBR				
(U)	Current Budget Submit/FY 2003 PBR	33,267	0	0	TBD

(U) Significant Program Changes:
Note: In FY 2002, the efforts performed under this program transferred to PE 0603216F, Project 4921.

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

(U) Related Activities:
(U) PE 0602203F, Aerospace Propulsion.
(U) PE 0603112F, Advanced Materials for Weapon Systems
(U) PE 0603216F, Aerospace Propulsion and Power Technology.
(U) PE 0602122N, Aircraft Technology
(U) PE 0603217N, Air Systems Advanced Technology Demonstration.
(U) This project 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.