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

DATE: February 2003

BUDGET ACTIVITY: 07 - Operational System Development

PE NUMBER AND TITLE: 0708011F Industrial Preparedness

PROJECT: 2865

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
2865	Manufacturing Technology	55,694	44,381	39,396	40,112	39,505	40,157	40,787	41,336	Continuing	TBD
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

Note: Program funding was reduced in FY 2003 from FY 2002 due to higher priority Air Force requirements.

(U) A. Mission Description

The DoD Manufacturing Technology (ManTech) program is mandated by Section 2521, Title 10, United States Code, to create an affordable, world-class industrial base manufacturing capability responsive to warfighter's needs. The Air Force ManTech major program tenets are: improvement of manufacturing processes and technologies; collaboration with Government program offices, industry, and academia; investments in technologies beyond reasonable risk level for industry alone; cost-sharing; multiple system/customer applications; potential for significant return on investment; and customer commitment to implement. To this end, ManTech develops, demonstrates, and transitions advanced manufacturing processes and technologies to reduce costs, improve quality/capability, and shorten cycle times of weapon systems during design, development, production, and sustainment. ManTech projects include efforts that respond to Government program office acquisition and sustainment requirements to reduce cost, schedule, cycle time, and risks during transition of technology. Where mature processes are not available, laboratory-developed initial process capabilities are matured and inserted into weapon system programs. ManTech's project scope often extends beyond factory floor manufacturing/repair processes, encompassing every activity within an industrial enterprise, ranging from business management tools to supplier base interactions and performance. ManTech program efforts also enhance repair/remanufacture capabilities to affordably sustain the aging weapon systems inventory, thereby, reducing total ownership costs. ManTech objectives are conducted through partnership with all industry levels, from large prime contractors to small material and parts vendors. Program planning centers on the aeronautical, sustainment, armament/directed energy, and command, control, intelligence, surveillance, and reconnaissance sectors of the industrial base. Note: In FY 2003, Congress added $3.2M for Prototype Low-Observable Coatings Development, $2.0M for Laser Peening for F-119 Engine, $1.5M for Technology Insertion Demonstration and Evaluation, and $1.0M for Bipolar Wafer-Cell Nickel-Metal Hydride Aircraft Battery.

(U) FY 2002 ($ in Thousands)

(U) $0 Accomplishments/Planned Program

(U) $24,870 Launched affordable and efficient manufacturing technology investigations for critical, high quality and reliable structural, propulsion, and electronic components and assemblies required for existing and next generation aircraft (e.g., missile warning sensor). Conducted high-value pilot efforts to verify advantages of flexible manufacturing, commercial/military integration, quality processing, and supplier improvements (e.g., Composites Affordability Initiative). Leveraged specialty aerospace metals work into metals affordability initiatives focused on laser forming, casting, welding, and forging. Focused long-term projects using lean enterprise integration tools. Delivered final version of the Lean Enterprise

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(U) A. Mission Description Continued

(U) FY 2002 ($ in Thousands) Continued

Self-Assessment Tool and Transition to Lean Roadmaps to aerospace industry. Completed Lean Education curriculum for Defense Acquisition University. Continued rapid response productivity improvement efforts with selected high value programs. Continued activities aimed at manufacture of more affordable low-observable coatings. Established processing parameters for optimized manufacture of high strength, low weight fiber composites for transition to C-17. Planned effort to reduce high-cycle fatigue damping in engine components. Completed investigations for manufacturing modeling and simulation activity to reduce the number of engineering change orders generated in manufacturing enterprises (Integrated Manufacturing Simulation for Affordability).

(U) $13,267 Provided cost-effective repair and manufacturing technologies for affordable sustainment of existing weapon systems to enhance mission readiness. Completed reconfigurable tool for rapid, accurate sheet metal stretch forming. Completed transition of lean concepts applied to maintenance, repair, and overhaul activities at organic and contractor depots. Reduced repair and maintenance cycle time for aging systems and established remanufacturing capabilities which rapidly generate standardized replacement parts on demand. Continued pilot efforts to assess benefits derived from inserting electronic parts obsolescence management tools into weapon system production programs. Initiated technical effort to extend the life of critical, high-value rotating engine components exposed to high cycle fatigue environments. Continued rapid response productivity improvement efforts to overcome structural damage of hot trailing edges found in the wake of hot engine exhaust, improve Air Logistics Center depaint capabilities, and implemented sustainment improvements for Air Logistic Center engine refurbishment shops.

(U) $7,169 Pursued efficient and cost-effective manufacturing methods for high performance, high reliability electronics, lightweight structures, and efficient propulsion methods for advanced tactical missiles. Established system-level, pilot efforts to assess potential benefits accrued from inserting best practices from small and medium size suppliers into weapon system production programs (e.g., Joint Direct Attack Munition, AIM-9X). Initiated joint program with Navy to provide lower drift rate Inertial Measurement Unit (IMU) for Micro-Electro-Mechanical Systems. Continued rapid response productivity improvement efforts to: increase production (surge) rate of IMUs for precision-guided munitions; provide high quality glass material acceptable for use in airborne laser turret windows; and enhance low-observable coatings for structural composite airframes in air launched munitions.

(U) $5,348 Provided affordable, flexible manufacturing process development to reduce cost and lead-time for higher performance spacecraft and launch vehicles. Established effective and efficient manufacturing technology for critical high quality, reliable electronic components and assemblies required for surveillance, tracking communications links, and data/signal processing. Conducted pilot efforts to demonstrate enhanced and efficient manufacturing capability for low-rate production capability of components and weapon systems in the space, launch, and command, control, communications, and intelligence industrial base sectors. Continued efforts to rapidly respond to space sector manufacturing issues (e.g., leverage standard modular spacecraft architecture using flexible multi-mission production lines to achieve cost and cycle time reductions). Continued rapid response productivity improvement effort to improve affordability of space-based radar/electronic components.

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(U) A. Mission Description Continued

(U) FY 2002 ($ in Thousands) Continued

(U)	$4,049	Developed tasks associated with Advanced Low-Observable Coatings (e.g., increased sputtering rate during coating application).
(U)	$991	Developed tasks associated with Laser Peening for F-119 Engine (e.g., increased damage tolerance of integrally bladed rotors).
(U)	$55,694	Total

(U) FY 2003 ($ in Thousands)

(U)	$0	Accomplishments/Planned Program
(U)	$19,540	Continue affordable and efficient manufacturing technology investigations for critical, high quality and reliable structural, propulsion, stealth, and electronic components and assemblies required for existing and next generation aircraft. Continue high-value pilot efforts to verify advantages of flexible manufacturing, commercial/military integration, quality processing, and supplier improvements (e.g., Composites Affordability Initiative). Complete metals affordability initiatives focused on laser forming, casting, welding, and forging. Continue activities aimed at manufacture of more affordable low-observable coatings. Start effort to reduce high-cycle fatigue damping in engine components. Initiate rapid response productivity improvement effort to address manufacturing issues related to agile acquisition of low-rate production airframes.
(U)	$12,185	Pursue cost-effective repair and manufacturing technologies for affordable sustainment of aircraft and turbine engine components. Continue pilot efforts to assess benefits derived from inserting electronic parts obsolescence management tools into weapon system production programs. Continue technical effort to extend the life of critical, high-value rotating engine components exposed to high cycle fatigue environments (Engine Rotor Life Extension effort).
(U)	$4,094	Continue development of efficient and cost-effective manufacturing methods for high performance, high reliability electronics for advanced tactical missiles and aircraft missile sensors. Continue joint program with Navy to provide a lower drift-rate Inertial Measurement Unit (IMU) for Micro-Electro-Mechanical Systems. Complete rapid response productivity improvement efforts to increase production (surge) rate of IMUs for precision-guided munitions and provide high quality glass material acceptable for use in airborne laser turret windows.
(U)	$1,119	Develop risk reduction efforts addressing critical manufacturing issues for various command, control, intelligence, surveillance, and reconnaissance platforms. Focus efforts on components such as electronically scanned arrays to improve producibility, reliability, and affordability.
(U)	$3,093	Develop tasks associated with Prototype Low-Observable Coatings Development (e.g., increase sputtering rate during coating application).
(U)	$1,933	Develop tasks associated with Laser Peening for F-119 Engine (e.g., increase damage tolerance of integrally bladed rotors).
(U)	$1,451	Develop tasks associated with Technology Insertion Demonstration and Evaluation (e.g., supply chain requirements definition, system development, and demonstration).

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(U) A. Mission Description Continued

(U) FY 2003 ($ in Thousands) Continued

(U) $966 Develop tasks associated with Bipolar Wafer-Cell Nickel-Metal Hydride Aircraft Battery (e.g., performance testing and environmental testing).

(U) $44,381 Total

(U) FY 2004 ($ in Thousands)

(U) $0 Accomplishments/Planned Program

(U) $16,423 Pursue affordable and efficient manufacturing technology investigations for critical, high quality, reliable structural, propulsion, stealth, and electronic components and assemblies required for existing and next generation aircraft. Complete manufacturability efforts of laser components for the Affordable Missile Warning Sensor for large aircraft. Continue high value pilot efforts to verify advantages of flexible manufacturing, commercial/military integration, quality processing, and supplier improvements (e.g., Composites Affordability Initiative). Investigate and develop manufacturing capabilities for more affordable low-observable structures. Continue effort to reduce high-cycle fatigue damping in engine components. Initiate/continue rapid response producibility improvement efforts with selected high value programs.

(U) $8,085 Pursue cost-effective repair and manufacturing technologies for affordable sustainment of aircraft and turbine engine components. Complete pilot efforts to demonstrate benefits from inserting electronic parts obsolescence management tools into weapon system production programs. Maintain technical effort to extend the life of critical, high-value rotating engine components, which have been exposed to high cycle fatigue environments (e.g., Engine Rotor Life Extension effort). Initiate/continue rapid response producibility improvement efforts with selected high value programs.

(U) $4,735 Continue to pursue efficient and cost-effective manufacturing methods for high performance, high reliability components for advanced tactical missiles, aircraft missile sensors (e.g., Inertial Measurement Unit for Micro-Electro-Mechanical Systems effort), and directed energy systems. Initiate manufacturing technology efforts supporting producibility/affordability improvements in high priority precision-guided munitions components. Initiate/continue rapid response producibility improvement efforts with selected high value programs.

(U) $10,153 Continue efforts to address critical electronics manufacturing technologies for various command, command, control, intelligence, surveillance, and reconnaissance platforms. Focus efforts on components such as electronically scanned arrays to improve producibility, reliability, and affordability. Initiate/continue rapid response producibility improvement efforts with selected high value programs.

(U) $39,396 Total

(U) B. Budget Activity Justification

ManTech is in Budget Activity 7, Operational System Development, since it provides support for systems in design, production, and/or operational use. ManTech is part of the Industrial Preparedness Program Element supporting the Defense Planning Guidance and the Air Force Planning Guidance.

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

		FY 2002	FY 2003	FY 2004	Total Cost
(U)	Previous President's Budget	58,406	37,581	40,319	
(U)	Appropriated Value	58,982	45,281		
(U)	Adjustments to Appropriated Value				
	a. Congressional/General Reductions	-576	-478		
	b. Small Business Innovative Research	-1,538			
	c. Omnibus or Other Above Threshold Reprogram		-422		
	d. Below Threshold Reprogram	-900			
	e. Rescissions	-274			
(U)	Adjustments to Budget Years Since FY 2003 PBR			-923	
(U)	Current Budget Submit/FY 2004 PBR	55,694	44,381	39,396	TBD

(U) Significant Program Changes:
Not applicable.

(U) D. Other Program Funding Summary ($ 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
(U)	AF RDT&E										
(U)	Other APPN										

Not Applicable.

(U) E. Acquisition Strategy

All major contracts in this Program Element were awarded after full and open competition.

(U) F. Schedule Profile

FY 2002	FY 2003	FY 2004

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(U) F. Schedule Profile Continued

		FY 2002				FY 2003				FY 2004			
		1	2	3	4	1	2	3	4	1	2	3	4
(U)	Manufacturing technology for aeronautical systems												
(U)	Request for Proposal Release		*				X			X			
(U)	Contract Awards			*				X			X		
(U)	Repair/remanufacture technologies for weapon systems sustainment												
(U)	Request for Proposal Release	*											
(U)	Contract Awards		*										
(U)	Manufacturing technologies for missiles, munitions, directed energy												
(U)	Request for Proposal Release	*								X			
(U)	Contract Awards		*	*							X		
(U)	Mfg for command, control, intel, surveillance, and reconnaissance												
(U)	Request for Proposal Release	*					X			X			
(U)	Contract Awards		*					X			X		

* = completed, X = planned

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)

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(U) A. Project Cost Breakdown ($ in Thousands)

		FY 2002	FY 2003	FY 2004
(U)	Manufacturing technologies for aeronautical systems	24,870	19,540	16,423
(U)	Repair/remanufacture technologies for weapon system sustainment	13,267	12,185	8,085
(U)	Manufacturing technologies for missiles, munitions, and directed energy weapons	7,169	4,094	4,735
(U)	Manufacturing technologies for command, control, intelligence, surveillance, and reconnaissance	5,348	1,119	10,153
(U)	Bipolar Wafer-Cell Nickel Metal-Hydride Aircraft Battery	0	966	
(U)	Prototype Low-Observable Coatings Development	4,049	3,093	
(U)	Laser Peening for F-119 Engine	991	1,933	
(U)	Technology Insertion Demonstration and Evaluation		1,451	
(U)	Total	55,694	44,381	39,396

(U) B. Budget Acquisition History and Planning Information ($ in Thousands)

(U) Performing Organizations:

Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 2002	Budget FY 2002	Budget FY 2003	Budget FY 2004	Budget to Complete	Total Program
Product Development Organizations										
Advanced Technology Inst	Coop Agmt	Aug 00	N/A	N/A	500	325	0	0	0	825
Aerojet-General Corp	Coop Agmt	Various	N/A	N/A	1,850	300	0	0	0	2,150
Anteon	Various	Various	N/A	N/A	6,042	644	966	0	0	7,652
AT&T Government Solutions	Cost Plus	Mar 02	N/A	N/A	0	300	0	0	0	300
Boeing	Various	Various	N/A	N/A	20,990	4,680	1,180	1,030	0	27,880
Central State University	Cost Share	Jul 00	N/A	N/A	212	100	88	0	0	400
Frontier Technologies	Cost Plus	May 00	N/A	N/A	150	215	192	0	0	557
GE	Coop Agmt	Jun 99	N/A	N/A	898	0	0	0	0	898
GRC	Cost Plus	Various	N/A	N/A	2,170	300	0	0	0	2,470
Honeywell	Various	Various	N/A	N/A	900	1,790	1,500	1,500	0	5,690

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(U) **Performing Organizations Continued:**

Product Development Organizations										
KBSI	Cost Share	Nov 98	N/A	N/A	2,975	375	0	0	0	3,350
Lockheed Martin	Various	Various	N/A	N/A	11,795	3,079	1,371	995	0	17,240
LSP Technologies	Cost Share	Various	N/A	N/A	5,793	1,108	1,933	0	0	8,834
Mississippi State University	Cost Share	Jul 00	N/A	N/A	150	100	0	0	0	250
MIT	Coop Agmt	Various	N/A	N/A	8,800	1,656	0	0	0	10,456
Motorola	Tech Int Agr	Mar 99	N/A	N/A	1,939	0	0	0	0	1,939
Northrop Grumman	Various	Various	N/A	N/A	17,997	7,188	4,744	2,100	0	32,029
Pratt & Whitney	Tech Int Agr	Jun 99	N/A	N/A	5,600	350	0	0	0	5,950
Raytheon	Coop Agmt	Aug 00	N/A	N/A	500	600	0	0	0	1,100
TMCI	Cost Plus	Various	N/A	N/A	875	760	0	0	0	1,635
TRW	Coop Agmt	Various	N/A	N/A	3,325	1,290	0	0	0	4,615
Univ Dayton Res Inst	Cost Plus	Apr 02	N/A	N/A	200	3,100	5,004	4,400	0	12,704
Univ Maryland	Coop Agmt	Jun 99	N/A	N/A	1,900	350	300	0	0	2,550
UTC	Various	Various	N/A	N/A	280	250	300	0	0	830
Various	Various	Various	N/A	N/A	50,005	26,834	26,803	29,371	Continuing	TBD
Support and Management Organizations										
In house support										
Test and Evaluation Organizations										

Subtotals	Total Prior to FY 2002	Budget FY 2002	Budget FY 2003	Budget FY 2004	Budget to Complete	Total Program
Subtotal Product Development	145,846	55,694	44,381	39,396	TBD	TBD
Subtotal Support and Management						
Subtotal Test and Evaluation						
Total Project	145,846	55,694	44,381	39,396	TBD	TBD