

## UNCLASSIFIED

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

DATE

June 2001

BUDGET ACTIVITY

07 - Operational System Development

PE NUMBER AND TITLE

0708011F Industrial Preparedness

PROJECT

2865

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
2865 Manufacturing Technology	50,913	58,342	53,782	54,415	55,639	56,611	57,783	59,006	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

FY03-FY07 budget numbers do not reflect the DoD strategy review results.

(U) **A. Mission Description**

The corporate Air Force Manufacturing Technology (ManTech) program supports the DoD ManTech program as mandated by Section 2525, Title 10, United States Code. ManTech demonstrates advancements in manufacturing process technologies, engineering systems, and industrial practices. New manufacturing capabilities are transitioned into Air Force weapon system design, acquisition, and sustainment programs. ManTech also provides cost reduction processes/practices for future and legacy systems. ManTech strives to make superior mission enabling technologies an affordable life cycle reality. Efficiencies comparable to world class enterprises are achieved by expanding DoD's access to a capable, responsible, multi-use industrial base. Program efforts accelerate shop floor manufacturing process maturation at every stage through increased emphasis on cost, schedule, and quality risks in transition. Where mature processes are not available, laboratory-developed initial process capabilities are matured and inserted into weapon system programs. ManTech goes beyond just factory floor manufacturing/repair processes. It encompasses every activity within an industrial enterprise, ranging from business management (e.g., tools for Integrated Product Process Development (IPPD)) to supplier base interactions and performance. The strategies and best practices of world-class enterprises are analyzed and the performance of defense suppliers benchmarked. The world's best industrial practices are adapted and validated in multiple pilot projects and deployed in defense applications. Project efforts target all industry levels, from large prime contractors to small material and parts vendors. Program emphasis is on the aircraft, missile, munitions, spacecraft, and launch vehicle sectors of the industrial base. Program efforts also enhance repair/remanufacture capabilities to affordably sustain the aging weapon systems inventory, thereby reducing total ownership costs. Note: In FY 2001, Congress added \$5.8 million to this program for Specialty Aerospace Metals (\$3.8 million) and a Nickel Metal-Hydride Replacement Battery (\$2.0 million).

(U) **FY 2000 (\$ in Thousands)**

- (U) \$22,061 Demonstrated cost-effective and efficient manufacturing technologies for critical, high quality, reliable structural, propulsion, and electronic components and assemblies required for existing and next generation aircraft. Led pilot efforts in high-payoff endeavors aimed at validating potential benefits accrued from flexible manufacturing, commercial/military integration, quality processing, and supplier improvements. Conducted long-term projects focused on Integrated Product Process Development (IPPD) tools. Efforts included Phase II of the Forging Supplier Initiative and continuance of the Composites Affordability Initiative to achieve a 50% cost reduction in fighter aircraft structures.
- (U) \$19,746 Provided cost-effective repair and manufacturing technologies for affordable sustainment of existing weapon systems and to enhance mission readiness. Reduced repair and maintenance cycle time for aging systems and established remanufacturing capabilities which will rapidly generate

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE June 2001
BUDGET ACTIVITY <b>07 - Operational System Development</b>	PE NUMBER AND TITLE <b>0708011F Industrial Preparedness</b>	PROJECT <b>2865</b>
(U) <u>A. Mission Description Continued</u>		
(U) <u>FY 2000 (\$ in Thousands) Continued</u>		
(U) \$2,530	standardized replacement parts on demand. Achieved process improvements for repair/remanufacture of large area structures on legacy aircraft. Promoted efficient and cost-effective manufacturing methods for high performance, high reliability electronics, lightweight structures, and efficient propulsion methods for advanced tactical missiles. Instituted manufacturing improvements required to transition precision-guided munition subsystems into production. Chartered pilot efforts in high-payoff endeavors aimed at validating potential benefits accrued from inserting best practices in the production of weapon systems.	
(U) \$6,076	Demonstrated affordable, flexible manufacturing processes to reduce the cost and lead time of higher performance spacecraft and launch vehicles. Established effective and efficient manufacturing technology for critical high quality, reliable electronic component and assemblies required for surveillance, tracking communications links, and data/signal processing. Piloted high return on investment efforts to provide efficient, low-cost capability to produce components and weapon systems in the space, launch, and Command, Control, Communications, and Intelligence (C3I) industrial base sectors. Initiated effort to rapidly respond to space sector manufacturing issues.	
(U) \$500	Started development of mass production automation process for Nickel Metal-Hydride Replacement Battery effort.	
(U) \$50,913	Total	
(U) <u>FY 2001 (\$ in Thousands)</u>		
(U) \$22,869	Continue to invest in cost-effective and efficient manufacturing technology demonstrations for critical, high quality, reliable structural, propulsion, and electronic components and assemblies required for future and legacy aircraft. Maintain pilot efforts in high leverage activities to validate potential benefits accrued from flexible manufacturing, commercial/military integration, quality processing, and supplier improvements. Perform long-term projects to develop lean enterprise integration tools. Initiate an effort to catalog and implement lean concepts. Start manufacturing modeling and simulation activity (Integrated Manufacturing Simulation for Affordability project).	
(U) \$20,677	Enhance current weapon system mission readiness by establishing/demonstrating cost-effective repair and remanufacturing technologies for affordable sustainment. Reduce repair and maintenance cycle time for aging systems. Develop remanufacturing capabilities to rapidly generate standardized replacement parts on demand. Initiate an effort to address technologies for turbine engine life extension.	
(U) \$2,654	Further the manufacturing state-of-the-art for advanced tactical missiles. Establish and demonstrate efficient and cost-effective manufacturing methods for high performance, high reliability electronics, lightweight structures, and efficient propulsion methods. Identify and implement manufacturing improvements required to transition precision-guided munition subsystems into production. Conduct high-payoff pilot projects to validate potential benefits accrued from using production best practices. Initiate a program to establish affordable manufacturing processes for Micro-Electro-Mechanical Systems (MEMS) applied to inertial measurement units.	
(U) \$6,342	Establish and demonstrate affordable, flexible manufacturing processes to reduce the cost and lead time of higher performance spacecraft and	
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BUDGET ACTIVITY	PE NUMBER AND TITLE	
07 - Operational System Development	0708011F Industrial Preparedness	
	PROJECT	
	2865	
(U)	<u>A. Mission Description Continued</u>	
(U)	<u>FY 2001 (\$ in Thousands) Continued</u>	
	launch vehicles. Provide effective and efficient manufacturing technology for critical high quality, reliable electronic components/assemblies for surveillance, tracking communications links, and data/signal processing. Conduct pilot efforts in high-payoff endeavors for efficient, low-cost capability to produce components and weapon systems in the spacecraft, launch vehicles, and Command, Control, Communications, and Intelligence (C3I) industrial base sectors. Maintain efforts to rapidly respond to space sector manufacturing issues.	
(U)	\$3,800	Start tasks associated with affordable processing of Specialty Aerospace Metals (e.g., laser forming, casting, welding, forging).
(U)	\$2,000	Start scale-up of semi-automatic production process for Nickel Metal-Hydride Replacement Battery effort.
(U)	\$58,342	Total
(U)	<u>FY 2002 (\$ in Thousands)</u>	
(U)	\$23,606	Launch affordable and efficient manufacturing technology investigations for critical, high quality, reliable structural, propulsion, and electronic components and assemblies required for existing and next generation aircraft. Conduct high-value pilot efforts to verify advantages of flexible manufacturing, commercial/military integration, quality processing, and supplier improvements (e.g., Composites Affordability Initiative (CAI) Phase III. Leverage specialty aerospace metals work into metals affordability initiatives focused on laser forming, casting, welding, and forging. Focus long-term projects using lean enterprise integration tools (e.g., Lean Enterprise Self-Assessment Tool (LESAT) and Transition-to-Lean Roadmaps). Continue effort to catalog and implement lean concepts. Start manufacturing modeling and simulation activity to reduce the number of engineering change orders generated in manufacturing enterprises (Integrated Manufacturing Simulation for Affordability (IMSA) effort.
(U)	\$20,933	Address cost-effective repair and manufacturing technologies for affordable sustainment of existing weapon systems to enhance mission readiness. Start activity on manufacturing materials for high-cycle fatigue damping in engine components. Reduce repair and maintenance cycle time for aging systems and establish remanufacturing capabilities which will rapidly generate standardized replacement parts on demand. Start Engine Rotor Life Extension (ERLE) effort.
(U)	\$2,750	Pursue efficient and cost-effective manufacturing methods for high performance, high reliability electronics, lightweight structures, and efficient propulsion methods for advanced tactical missiles. Accomplish pilot efforts to assess potential benefits accrued from inserting best practices into weapon system production programs. Incorporate manufacturing improvements to transition precision-guided munition subsystems into production. Start joint program with Army on Inertial Measurement Unit for Micro-Electro-Mechanical Systems (IMU for MEMS).
(U)	\$6,493	Sponsor affordable, flexible manufacturing process development to reduce cost and lead time for higher performance spacecraft and launch vehicles. Establish effective and efficient manufacturing technology for critical high quality, reliable electronic component and assemblies required for surveillance, tracking communications links, and data/signal processing. Conduct pilot efforts in high-payoff endeavors to enable efficient, low-cost production capability for components and weapon systems in the space, launch, and Command, Control, Communications, and
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<p>(U) <b><u>A. Mission Description Continued</u></b></p> <p>(U) <b><u>FY 2002 (\$ in Thousands) Continued</u></b></p> <p style="padding-left: 40px;">Intelligence (C3I) industrial base sectors. Continue 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).</p> <p>(U) \$53,782      Total</p> <p>(U) <b><u>B. Budget Activity Justification</u></b></p> <p style="padding-left: 40px;">ManTech is part of Budget Activity 7, Operational System Development, to provide 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.</p> <p>(U) <b><u>C. Program Change Summary (\$ in Thousands)</u></b></p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;"></th> <th style="width: 10%; text-align: center;"><u>FY 2000</u></th> <th style="width: 10%; text-align: center;"><u>FY 2001</u></th> <th style="width: 10%; text-align: center;"><u>FY 2002</u></th> <th style="width: 20%; text-align: center;"><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>(U) Previous President's Budget (FY 2001 PBR)</td> <td style="text-align: center;">51,988</td> <td style="text-align: center;">53,082</td> <td style="text-align: center;">53,600</td> <td></td> </tr> <tr> <td>(U) Appropriated Value</td> <td style="text-align: center;">52,314</td> <td style="text-align: center;">58,882</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. 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Rescissions</td> <td style="text-align: center;">-205</td> <td style="text-align: center;">-540</td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Budget Years Since FY 2001 PBR</td> <td></td> <td></td> <td style="text-align: center;">182</td> <td></td> </tr> <tr> <td>(U) Current Budget Submit/FY 2002 PBR</td> <td style="text-align: center;">50,913</td> <td style="text-align: center;">58,342</td> <td style="text-align: center;">53,782</td> <td style="text-align: center;">TBD</td> </tr> </tbody> </table> <p>(U) <b><u>Significant Program Changes:</u></b> Not Applicable.</p> <p>(U) <b><u>D. 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(U) E. Acquisition Strategy

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

(U) F. Schedule Profile

<u>FY 2000</u>				<u>FY 2001</u>				<u>FY 2002</u>			
1	2	3	4	1	2	3	4	1	2	3	4

(U) Not Applicable

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE June 2001		
BUDGET ACTIVITY					PE NUMBER AND TITLE				PROJECT	
07 - Operational System Development					0708011F Industrial Preparedness				2865	
(U) <u>A. Project Cost Breakdown (\$ in Thousands)</u>										
					FY 2000		FY 2001		FY 2002	
(U)	Manufacturing technologies for aircraft components				22,061		22,869		23,606	
(U)	Repair/remanufacture technologies for weapon system sustainment				19,746		20,677		20,933	
(U)	Manufacturing methods for missile and munition assemblies				2,530		2,654		2,750	
(U)	Manufacturing processes to reduce spacecraft and launch vehicle costs				6,076		6,342		6,493	
(U)	Nickel Metal-Hydride Replacement Battery effort				500		2,000		0	
(U)	Specialty Aerospace Metals						3,800			
(U)	Total				50,913		58,342		53,782	
(U) <u>B. Budget Acquisition History and Planning Information (\$ in Thousands)</u>										
(U) <u>Performing Organizations:</u>										
<u>Contractor or</u>		<u>Contract</u>								
<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>						
<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 2000</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Organizations</u>										
Numerous	Various	Various	N/A	N/A	19,068	24,945	22,453	22,556	Continuing	TBD
Howmet	Cost Share	Jul 95	N/A	N/A	12,935	3,500	3,500	0	0	19,935
Composites Affordability Initiative (Consortium)	Various	Various	N/A	N/A	13,055	4,220	5,150	5,000	3,500	30,925
Sustainment Initiative	Various	Various	N/A	N/A	2,430	4,500	4,822	4,475	3,100	19,327
Engine Forging Initiative	Various	May 99	N/A	N/A	1,200	2,300	3,000	2,000	0	8,500
Parts Obsolescence Initiative	Various	Various	N/A	N/A	3,120	4,773	5,449	3,761	245	17,348
Small/Medium Supplier Initiative	Various	Various	N/A	N/A	300	1,400	2,650	3,325	0	7,675
ManTech for Affordable Spacecraft	Various	Various	N/A	N/A	1,875	2,525	3,475	3,665	2,500	14,040
Laser Shock Peening, Inc.	CS	Aug 98	N/A	N/A	1,700	2,000	1,343	0	0	5,043
Coherent Technology, Inc.	CS	Jun 97	N/A	N/A	2,100	250	0	0	0	2,350
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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)									DATE		June 2001	
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(U) <u>Performing Organizations Continued:</u>												
<u>Product Development Organizations</u>												
Turbine Engine Life		TBD	TBD	N/A	N/A	0	0	200	2,500	7,300	10,000	
Extension												
Affordable Missile Warning		TBD	TBD	N/A	N/A	0	0	200	2,500	0	2,700	
Sensor												
Integrated Manufacturing and		TBD	TBD	N/A	N/A	0	0	300	2,000	15,200	17,500	
Simulation for Affordability												
Electro Energy, Inc.		Various	Various	N/A	N/A	0	500	2,000	0	0	2,500	
Specialty Aerospace Metals		Various	Various	N/A	N/A	0	0	3,800	0	Continuing	TBD	
Metals Affordability Initiative		Various	Various	N/A	N/A	2,000	0	0	2,000	Continuing	TBD	
<u>Support and Management Organizations</u>												
In house support												
<u>Test and Evaluation Organizations</u>												
						<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>	
<u>Subtotals</u>						<u>to FY 2000</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>Complete</u>	<u>Program</u>	
Subtotal Product Development						59,783	50,913	58,342	53,782	TBD	TBD	
Subtotal Support and Management												
Subtotal Test and Evaluation												
Total Project						59,783	50,913	58,342	53,782	TBD	TBD	

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Exhibit R-3 (PE 0708011F)