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

DATE: February 2002

BUDGET ACTIVITY: 05 - Engineering and Manufacturing Development

PE NUMBER AND TITLE: 0605011F RDT&E For Aging Aircraft

PROJECT: 4685

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
4685	Aging Aircraft	24,659	41,211	19,871	24,699	25,176	25,670	26,169	Continuing	TBD
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0

(U) A. Mission Description

This program extends the service life, controls the rapidly rising sustainment costs, and retains the operational capability of the aging aircraft fleet. Using business case analyses, cross-cutting opportunities to reduce total ownership costs and improve productivity, reliability, availability, and maintainability are identified. The program develops tools to facilitate the sharing of aging aircraft information, knowledge, technology, and solutions among the Air Logistics Centers, Product Centers, System Program Offices, other Services and government agencies, and industry. The program provides senior Air Force decision makers with a common, comprehensive understanding of program areas such as corrosion, wiring, etc. The program also analyzes and recommends changes to existing sustainment processes such as field and depot repair processes. Note: In FY2002 Congress added $21.5M to this program for Aging Wiring & Corrosion Treatment ($7.0M), Aging Landing Gear Life Extension ($10.5M), Aging propulsion Systems Life Extension ($2.0M), and Knowledge Portal ($2.0M).

(U) FY 2001 ($ in Thousands)

(U) $166 Continued corrosion maintenance improvements. Developed abatement processes and temporary repairs. Provided a wider range of repair options. Reduced the cost and man-hours associated with corrosion maintenance. Continued development and integration of software and analytical tools to support corrosion management such as environmental exposure models and corrosion damage analyses that better allowed engineers to anticipate workload.

(U) $5,684 Continued work on improved non-destructive inspection (NDI) techniques. Reduced the time required to detect flaws and damage (e.g., fatigue cracking, corrosion, disbonds, and trapped moisture). Enabled early damage detection, thus allowing for less costly repairs. Developed NDI techniques to detect cracks without removing fasteners, reducing inspection time as well as eliminating the potential for further damage by removing fasteners. Expanded the application of ultrasonic inspection techniques to detect fatigue cracks in internal wing structure from the outside of the aircraft, which eliminated fuel tank entry requirements and potential damaging rivet removal.

(U) $7,133 Continued work on technologies to maintain the structural integrity of aging weapon systems, ensuring continued flight safety. Developed viable procedures to correct the delamination of aging integral fuel tank coatings, which improved corrosion protection and eliminate the need to replace wing skins.

(U) $176 Continued studies to identify policies and processes that needed to be developed or refined to help resolve aging avionics/electronics issues

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(U) A. Mission Description Continued

(U) FY 2001 ($ in Thousands) Continued

such as parts obsolescence and diminishing manufacturing sources. Initiated development of integrated avionics/electronics change management plans for common solutions across multiple platforms.

(U) $10,000 Initiated and completed engineering tasks associated with Aging Landing Gear Life Extension program (Congressional add).

(U) $1,500 Initiated and completed Aging Aircraft efforts related to Viable Combat Avionics (Congressional add).

(U) $24,659 Total

(U) FY 2002 ($ in Thousands)

(U) $6,230 Continue corrosion maintenance improvements. Develop corrosion abatement techniques, procedures, and temporary repairs. Expand the range of available repair technologies. Reduce the cost and man-hours associated with corrosion maintenance actions. Continue development and integration of software and analytical tools to support corrosion management workload prediction (e.g., environmental exposure models, corrosion damage analyses).

(U) $1,100 Continue work on improved non-destructive inspection (NDI) techniques. Shorten detection time for flaws and damage due to fatigue cracking, corrosion, composite material delaminations, and trapped moisture. Sponsor technology advancements to enable early damage detection, thus allowing for less costly repairs over the weapon system life cycle. Continue work on NDI techniques to detect cracks without removing fasteners to reduce inspection time and eliminate the potential for further damage by removing fasteners. Broaden the application of ultrasonic inspection techniques to detect fatigue cracks in internal wing structure from the outside of the aircraft to eliminate fuel tank entry requirements and potential damage caused by rivet removal.

(U) $4,800 Continue work on technologies to maintain the structural integrity of aging weapon systems to ensure continued flight safety. Develop viable procedures to correct the delamination of aging integral fuel tank coatings for improved corrosion protection and elimination of wing skin replacements.

(U) $1,930 Conduct analyses on aging aircraft problems to drive affordable modernization and sustainment solutions. Leverage existing knowledge of aging aircraft structures, avionics, and propulsion into business case analyses and related efforts to identify opportunities to reduce total ownership costs.

(U) $3,958 Develop cross-cutting aging aircraft system solutions (e.g., an NDI corrosion assessment tool for accurate structural health assessments, viable combat avionics). Develop techniques to incorporate high strength, corrosion resistant alloys into legacy airframes. Study aging wiring in the F-16 and C-17 fleet. Develop techniques for predicting aging wiring problems. Improve repair procedures to maintain the integrity of aging integral fuel tank coating materials.

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(U) A. Mission Description Continued

(U) FY 2002 ($ in Thousands) Continued

(U)	$1,901	Develop an information/knowledge management tool to share aging aircraft technology and solutions across the aeronautical community. Identify existing databases which contain aging aircraft information. Connect existing databases to a single web portal. Develop web-based data mining views that turn the raw data into information to facilitate strategic planning and trend analysis for reducing total ownership costs.
(U)	$6,932	Develop and complete efforts associated with Aging Wiring and Corrosion Treatment for Aging Aircraft (Congressional add).
(U)	$10,398	Develop and complete engineering tasks associated with Aging Landing Gear Life Extension program (Congressional add).
(U)	$1,981	Develop and complete efforts associated with Aging Propulsion Systems Life Extension (Congressional add).
(U)	$1,981	Develop and complete efforts associated with Aging Aircraft Knowledge Portal (Congressional add).
(U)	$41,211	Total

(U) FY 2003 ($ in Thousands)

(U)	$6,000	Continue corrosion maintenance improvements. Develop corrosion abatement techniques, procedures, and temporary repairs. Expand the range of available repair technologies. Reduce the cost and man-hours associated with corrosion maintenance actions. Continue development and integration of software and analytical tools to support corrosion management workload prediction (e.g., environmental exposure models, corrosion damage analyses).
(U)	$2,500	Continue work on improved non-destructive inspection (NDI) techniques, deployment of corrosion and crack detection capabilities and ongoing evaluation into new and more cost effective techniques. Shorten detection time for flaws and damage due to fatigue cracking, corrosion, composite material delaminations, and trapped moisture. Sponsor technology advancements to enable early damage detection, thus allowing for less costly repairs over the weapon system life cycle. Continue work on NDI techniques to detect cracks without removing fasteners to reduce inspection time and eliminate the potential for further damage by removing fasteners. Broaden the application of ultrasonic inspection techniques to detect fatigue cracks in internal wing structure from the outside of the aircraft to eliminate fuel tank entry requirements and potential damage caused by rivet removal.
(U)	$4,000	Continue work on technologies to maintain the structural integrity of aging weapon systems to ensure continued flight safety. Develop viable procedures to correct the delamination of aging integral fuel tank coatings for improved corrosion protection and elimination of wing skin replacements. Continue efforts to evaluate material improvement, crack detection support tools.
(U)	$1,075	Conduct analyses on aging aircraft problems to drive affordable modernization and sustainment solutions. Leverage existing knowledge of aging aircraft structures, avionics, and propulsion into business case analyses and related efforts to identify opportunities to reduce total ownership costs. Identify and analyze aging wiring problems in fighter, cargo, and tanker aircraft fleets. Conduct government and

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(U) A. Mission Description Continued

(U) FY 2003 ($ in Thousands) Continued

industry-wide forums to address cross-platform applications for aging aircraft solutions.

(U) $3,296 Develop cross-cutting aging aircraft system solutions (e.g., universal flight data acquisition/recorder systems, aircraft life support systems, aircraft support equipment). Develop techniques to incorporate high strength, corrosion resistant alloys into legacy airframes. Develop techniques for predicting aging wiring problems. Improve repair procedures to maintain the integrity of aging integral fuel tank coating materials. Leverage viable combat avionics work into common integrated aging avionics solutions (e.g., modular open systems architectures).

(U) $3,000 Develop partnerships with government and commercial industry to foster shared technologies and processes and an information/knowledge portal tool to share aging aircraft technology and solutions across the aeronautical community. Identify existing databases which contain aging aircraft information. Connect existing databases to a single web portal. Develop web-based data mining views that turn the raw data into information to facilitate strategic planning and trend analysis for reducing total ownership costs.

(U) $19,871 Total

(U) B. Budget Activity Justification

This program is in Budget Activity 5, Engineering and Manufacturing Development, because projects/capabilities will be developed in this program, then made available for procurement by already operational systems.

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

		FY 2001	FY 2002	FY 2003	Total Cost
(U)	Previous President's Budget	25,468	20,113	25,164	
(U)	Appropriated Value	25,704	41,613		
(U)	Adjustments to Appropriated Value				
	a. Congressional/General Reductions		-402		
	b. Small Business Innovative Research	-627			
	c. Omnibus or Other Above Threshold Reprogram				
	d. Below Threshold Reprogram	-182			
	e. Rescissions	-236			
(U)	Adjustments to Budget Years Since FY 2002 PBR			-5,293	
(U)	Current Budget Submit/FY 2003 PBR	24,659	41,211	19,871	TBD

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

(U) Significant Program Changes:
Program funding was reduced due to higher priority Air Force requirements.

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

(U) Related Activities:
(U) PE 0708026F, Productivity/Reliability/Availability/Maintainability.

(U) E. Acquisition Strategy

Funding may be executed internally within the Aging Aircraft SPO via full and open competition or released to other organizations for projects for which they are the Office of Primary Responsibility (OPR). The OPRs will determine the most appropriate contract vehicle, Design Engineering Program (DEP) contract or full and open competition, to accomplish the project.

(U) F. Schedule Profile

	FY 2001				FY 2002				FY 2003			
	1	2	3	4	1	2	3	4	1	2	3	4
(U) Screening for Corrosion and Maintenance Improvement Projects			*				X					
(U) Request For Proposal Release			*				X					
(U) Contract Awards	*	*	*		*	X	X					

Note: 1Q and 2Q contract awards are from prior year funds

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

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

		FY 2001	FY 2002	FY 2003
(U)	Corrosion Prevention and Control Techniques	166	6,230	6,000
(U)	Improved Non-Destructive Inspection Capabilities	5,684	1,100	2,500
(U)	Technologies to Enhance Structural Integrity	7,133	4,800	4,000
(U)	Aging Avionics/Electronics Approaches	176	0	0
(U)	Viable Combat Avionics	1,500	0	0
(U)	Aging Aircraft Analysis	0	1,930	1,075
(U)	Cross-Cutting Aging Aircraft Technology	0	3,958	3,296
(U)	Aging Aircraft Knowledge Management Tools	0	1,901	3,000
(U)	Aging Landing Gear Life Extension	10,000	10,398	0
(U)	Aging Wiring and Corrosion Treatment for Aging Aircraft	0	6,932	0
(U)	Aging Propulsion Systems Life Extension	0	1,981	0
(U)	Aging Aircraft Knowledge Portal	0	1,981	0
(U)	Total	24,659	41,211	19,871

(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 2001	Budget FY 2001	Budget FY 2002	Budget FY 2003	Budget to Complete	Total Program
Product Development Organizations										
ARINC/Boeing	T&M	Mar 01	N/A	N/A	0	487	0		0	487
Boeing	T&M	Apr 01	N/A	N/A	0	770	1,100	950	0	2,820
Lockheed Martin	T&M	Feb 01	N/A	N/A	0	467	0		0	467
Southwest Research	T&M	Mar 01	N/A	N/A	0	350	250	1,190	0	1,790
SAIC/Boeing	FFP	Mar 01	N/A	N/A	0	600	300	400	0	1,300
SAIC	T&M	Mar 01	N/A	N/A	0	980	300	300	0	1,580

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(U) Performing Organizations Continued:

Product Development Organizations										
UDRI/S&K Tech	TBD	Mar 01	N/A	N/A	0	1,380	0	9,920	0	11,300
S&K Tech		Various	N/A	N/A	0		5,200		0	5,200
UDRI	T&M	Mar 01	N/A	N/A	0	1,500	0		0	1,500
UDRI/Anteon	T&M	Apr 01	N/A	N/A	0	450	0		0	450
UDRI/NASA	T&M	Mar 01	N/A	N/A	0	1,330	1,190		0	2,520
General Atomics	TBD	TBD	N/A	N/A	0	10,000	0		0	10,000
Illinois Institute of Tech	T&M	Jan 01	N/A	N/A	0	1,500	0		0	1,500
Aging Landing Gear Life Extension	TBD	TBD	N/A	N/A	0	0	10,398		0	10,398
Aging Wiring and Corrosion Treatment for Aging Aircraft	TBD	TBD	N/A	N/A	0	0	6,932		0	6,932
Aging Propulsion Systems Life Extension	TBD	TBD	N/A	N/A	0	0	1,981		0	1,981
Aging Aircraft Knowledge Portal	TBD	TBD	N/A	N/A	0	0	1,981		0	1,981
Numerous	Various	Various	N/A	N/A	0	4,845	11,579	7,111	Continuing	TBD
Support and Management Organizations										
In House										
Test and Evaluation Organizations										

(U) Government Furnished Property:

Item Description	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Delivery Date	Total Prior to FY 2001	Budget FY 2001	Budget FY 2002	Budget FY 2003	Budget to Complete	Total Program
Product Development Property									
None									

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(U) Government Furnished Property Continued:

Support and Management Property

None

Test and Evaluation Property

None

Subtotals	Total Prior to FY 2001	Budget FY 2001	Budget FY 2002	Budget FY 2003	Budget to Complete	Total Program
Subtotal Product Development	0	24,659	41,211	19,871	TBD	TBD
Subtotal Support and Management						
Subtotal Test and Evaluation						
Total Project	0	24,659	41,211	19,871	TBD	TBD