Exhibit R-2, RDT&E Budget Item Justification: PB 2016 Air Force	Date: February 2015
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603199F / *Sustainment Science and Technology (S&T)*

COST ($ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
Total Program Element	-	12.380	15.800	18.378	-	18.378	20.636	22.811	23.217	23.680	Continuing	Continuing
635351: *Technology Sustainment*	-	12.380	15.800	18.378	-	18.378	20.636	22.811	23.217	23.680	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project develops and demonstrates mature Air Force Research Laboratory (AFRL) sustainment technologies such as: materials, corrosion, maintenance/ repair techniques, state awareness/non-destructive inspection, health management, life prediction, composite certification and logistics for transition into fielded Air Force systems to reduce life cycle sustainment costs and increase readiness. Technologies matured and demonstrated impact affordability and availability of fielded aerospace weapon systems by reducing sustainment costs, extending service life, and maintaining mission readiness and capability. This project develops and demonstrates maintenance, life cycle management, and system/ fleet decision making technologies that can be implemented to address operational sustainment issues and could influence future system sustainability decisions via risk reduction to support inclusion into new systems. Studies are conducted to analyze processes and methodologies for application of technologies to address sustainment issues across the force, identifying cross cutting applications for fielded systems, and opportunities for building in sustainability into future applications. Efforts in this program have been coordinated through the Department of Defense (DoD) Science and Technology (S&T) process to harmonize efforts and eliminate duplication.

This program is in Budget Activity 3, Advanced Technology Development because this budget activity includes development of subsystems and components and efforts to integrate subsystems and components into system prototypes for field experiments and/or tests in a simulated environment.

B. Program Change Summary ($ in Millions)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Previous President's Budget	12.800	15.800	18.500	-	18.500
Current President's Budget	12.380	15.800	18.378	-	18.378
Total Adjustments	-0.420	-	-0.122	-	-0.122
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.420	-			
• Other Adjustments	-	-	-0.122	-	-0.122

C. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
Title: System Health Management/Assessment Technologies	4.261	4.868	5.010

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
Description: Develop, demonstrate, and transition state awareness/system health management technologies. Conduct studies and analyses to design sustainability into future applications. ***FY 2014 Accomplishments:*** Continued efforts to demonstrate and validate algorithms and techniques for system assessment and health management. Continue health assessment capability development for fielded systems and components. Continued development and demonstration of diagnostic technology to monitor/assess health of airframe/engine and components. Initiated active fuel bladder leak detection capability. Completed efforts to detect cracks beneath flush head fasteners and life prediction of wiring insulation. ***FY 2015 Plans:*** Continue development and demonstration of diagnostic technology to monitor/assess health of airframe/engine and components. Complete development of active fuel bladder leak detection capability. Continue health assessment capability development for fielded systems and components. Initiate arc mitigation for 270VDC systems. Initiate streamlined inspection data for improved health assessment. ***FY 2016 Plans:*** Continue development of diagnostic technology to monitor/assess health of airframe/engines and components. Continue health assessment capability development for fielded systems and components. Continue development and demonstration of diagnostic technology to monitor/assess health of airframe/engine and components.			
Title: Prevention/Enhanced Maintainability Technologies ***Description:*** Develop, demonstrate, and transition technologies to improve component design, maintenance, replacement, and concepts for performance improvement and reduced maintenance burden. ***FY 2014 Accomplishments:*** Continued efforts to demonstrate high reliability repair and maintenance technologies to increase service time between maintenance actions. Continued maturation of airframe/engine/subsystem technologies including replacement for honeycomb structures, and validation of erosion coating test protocol for improved component durability, reliability, and safety to increase time between maintenance actions and reduce maintenance cost drivers. Initiated development of friction plug welding for a B-1B panel repair; repair technologies for B-1 airfoils; and of a solid state amplifier replacement for unsupportable vacuum tubes used on the B-1 aircraft's ALQ-161 defensive avionics system. Completed specialty materials inspection system demo. ***FY 2015 Plans:*** Continue efforts to demonstrate high reliability of repair and maintenance technologies to increase service time between maintenance actions, including a solid state amplifier replacement for unsupportable vacuum tubes used on the B-1 aircraft's	5.067	4.224	4.241

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
ALQ-161, defensive avionics system. Continue airframe/engine/subsystem technology efforts including replacement for honeycomb structures. Complete validation of erosion coating test protocol and flush head fastener inspection technologies for improved component durability, reliability, and safety to increase time between maintenance actions and reduce maintenance cost drivers. Continue integrally bladed rotor repair improvements. Initiate dust containment and on-aircraft mold mitigation improvements. Initiate demo for enhanced ester oil for turbine engines. ***FY 2016 Plans:*** Continue efforts to demonstrate high reliability of repair and maintenance technologies to increase service time between maintenance actions. Complete friction plug welding for B-1B panel. Complete thermal spray coating process. Continue solid state amplifier replacement for B-1B.			
Title: Management/Improved Reliability Technologies ***Description:*** Develop, demonstrate, and transition technologies to improve existing and new components, fleet management/ decision-making tools, and supply chain/sustainment infrastructure to decrease downtime and costs, and increase reliability. ***FY 2014 Accomplishments:*** Continued efforts to develop system fleet management decision-making tools, repair data base technologies and techniques, and supply chain/infrastructure approaches to reduce sustainment costs. Initiated injection molded canopy demo. Initiated canopy coating improvements. Initiated updated spacecraft propulsion model. Initiated cold work holes analysis to reduce inspections. ***FY 2015 Plans:*** Continue efforts to develop system fleet management decision-making tools, repair data base technologies and techniques, and supply chain/infrastructure approaches to reduce sustainment costs. Continue F-22 canopy efforts. Initiate structural/NDI tool verification. Continue updated spacecraft propulsion model. Continue quantification of life extension prediction of A-10 and T-38 aircraft cold worked holes. ***FY 2016 Plans:*** Continue efforts to develop system fleet management decision-making tools, repair data base technologies and techniques, and supply chain/infrastructure approaches to reduce sustainment costs.	3.052	4.208	4.749
Title: Composite Certification ***Description:*** Develop, demonstrate and transition reliability-based design of advanced composites for aircraft structures. ***FY 2014 Accomplishments:*** N/A ***FY 2015 Plans:***	-	2.500	4.378

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
Demonstrate accurate prediction of the probability of failure and life of bonded and unitized composite structures. Demonstrate manufacturing processes and manufacturing process control of composite primary structures. Demonstrate feasibility of implementing a damage tolerant design approach for composite structures. Demonstrate feasibility and benefits of a robust process for predicting and addressing the risk elements for safe and affordable certification of composite structures. Demonstrate life extension of a composite primary structure beyond that of the original certified service life. ***FY 2016 Plans:*** Complete demonstration of accurate prediction of the probability of failure and life of bonded and unitized composite structures. Continue demonstration of manufacturing processes and manufacturing process control of composite primary structures. Continue demonstrating the feasibility of implementing a damage tolerant design approach for composite structures. Continue demonstration of the feasibility and benefits of a robust process for predicting and addressing the risk elements for safe and affordable certification of composite structures. Continue demonstration of life extension of a composite primary structure beyond that of the original certified service life.			
Accomplishments/Planned Programs Subtotals	12.380	15.800	18.378

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

Not Applicable.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.