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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2017 Air Force										<b>Date:</b> February 2016		
<b>Appropriation/Budget Activity</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>					<b>R-1 Program Element (Number/Name)</b> PE 0603199F / <i>Sustainment Science and Technology (S&amp;T)</i>							
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
Total Program Element	-	14.900	18.378	20.636	0.000	20.636	22.811	23.217	23.680	24.154	Continuing	Continuing
635351: <i>Technology Sustainment</i>	-	14.900	18.378	20.636	0.000	20.636	22.811	23.217	23.680	24.154	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, low observable materials and processes, composite materials 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. This project also develops and demonstrates affordable advanced composites for aircraft structures of fielded and emerging systems. This includes studies, analysis, and tests for application of composites to address sustainment and affordability issues across the force. 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>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
Previous President's Budget	15.800	18.378	20.636	0.000	20.636
Current President's Budget	14.900	18.378	20.636	0.000	20.636
Total Adjustments	-0.900	0.000	0.000	0.000	0.000
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-0.450	0.000			
• SBIR/STTR Transfer	-0.450	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

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<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
<p><b>Title:</b> System Health Management/Assessment Technologies</p> <p><b>Description:</b> Develop, demonstrate, and transition state awareness/system health management technologies. Conduct studies and analyses to design sustainability into future applications.</p> <p><b>FY 2015 Accomplishments:</b> Continued development and demonstration of diagnostic technology to monitor/assess health of airframe/engine and components. Completed development of sonic infrared inspection capability. Continued health assessment capability development for fielded systems and components. Completed arc mitigation for 270 Volts Direct Current (VDC) systems.</p> <p><b>FY 2016 Plans:</b> 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.</p> <p><b>FY 2017 Plans:</b> 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.</p>		4.591	5.010	4.952
<p><b>Title:</b> Prevention/Enhanced Maintainability Technologies</p> <p><b>Description:</b> Develop, demonstrate, and transition maintenance and sustainment technologies to improve component design, maintenance, replacement, and concepts for performance improvement and reduced maintenance burden.</p> <p><b>FY 2015 Accomplishments:</b> Completed validation of erosion coating test protocol and flush head fastener inspection technologies for improved component durability, reliability, and safety. Completed friction plug welding for B-1B panel to increase time between maintenance actions and reduce maintenance cost drivers. Continued efforts to demonstrate high reliability of repair and maintenance technologies to increase service time between maintenance actions, including a solid state amplifier replacement for unsupported vacuum tubes used on the B-1 aircraft's ALQ-161, defensive avionics system. Continued airframe/engine/subsystem technology efforts including replacement for honeycomb structures. Continued development of materials and processes to reduce low observable sustainment. Continued integrally bladed rotor repair improvements. Initiated durable structure demonstrations. Initiated C-5 corrosion project. Initiated dust containment and on-aircraft mold mitigation improvements. Initiated demonstration for enhanced ester oil for turbine engines.</p> <p><b>FY 2016 Plans:</b></p>		3.983	4.241	5.024

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<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
<p>Continue efforts to demonstrate high reliability of repair and maintenance technologies to increase service time between maintenance actions. Continue airframe/engine/subsystem technology efforts including replacement for honeycomb structures. Continue development of materials and processes to reduce low observable Continue solid state amplifier replacement for B-1B. Continue enhanced ester oil and integrally bladed rotor repair modeling. Initiate thermal spray coating process.</p> <p><b>FY 2017 Plans:</b> Complete first low observable (L/O) articles. Continue efforts to demonstrate high reliability of repair and maintenance technologies to increase service time between maintenance actions. Continue enhanced ester oil and integrally bladed rotor repair modeling.</p>				
<p><b>Title:</b> Management/Improved Reliability Technologies</p> <p><b>Description:</b> 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.</p> <p><b>FY 2015 Accomplishments:</b> 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. Continued F-22 canopy efforts. Continued updated spacecraft propulsion model. Continued quantification of life extension prediction of A-10 and T-38 aircraft cold worked holes. Initiated structural/Non-destructive Inspection (NDI) tool verification. Initiated data visualization tool expansion from inspection data to depot maintenance data.</p> <p><b>FY 2016 Plans:</b> Complete data visualization tool expansion to depot maintenance data. 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 durable structure demonstrations. Continue C-5 corrosion project.</p> <p><b>FY 2017 Plans:</b> 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 durable structure demonstrations. Continue C-5 corrosion project.</p>		3.968	4.749	4.649
<p><b>Title:</b> Composite Certification</p> <p><b>Description:</b> Develop, demonstrate and transition reliability-based design of advanced composites for aircraft structures. This includes studies and analysis of processes and methodologies for application of composites to address sustainment and affordability issues across the force.</p>		2.358	4.378	6.011

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<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
<p><b><i>FY 2015 Accomplishments:</i></b>                      Demonstrated accurate prediction of the probability of failure and life of bonded and unitized composite structures. Demonstrated manufacturing processes and manufacturing process control of composite primary structures. Demonstrated feasibility of implementing a damage tolerant design approach for composite structures. Demonstrated feasibility and benefits of a robust process for predicting and addressing the risk elements for safe and affordable certification of composite structures. Demonstrated life extension of a composite primary structure beyond that of the original certified service life.</p> <p><b><i>FY 2016 Plans:</i></b>                      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. Initiate assessment and designs of affordable low cost composite manufacturing methods and processes.</p> <p><b><i>FY 2017 Plans:</i></b>                      Continue demonstration of manufacturing processes and manufacturing process control of composite primary structures. Complete 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. Complete assessment and designs of affordable low cost composite manufacturing methods and processes.</p>				
<b>Accomplishments/Planned Programs Subtotals</b>		14.900	18.378	20.636
<b>D. Other Program Funding Summary (\$ in Millions)</b>				
N/A				
<b>Remarks</b>				
<b>E. Acquisition Strategy</b>				
N/A				

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**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.

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