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Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Air Force									DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 3600: Research, Development, Test & Evaluation, Air Force BA 3: Advanced Technology Development (ATD)				R-1 ITEM NOMENCLATURE PE 0603199F: Sustainment Science and Technology (S&T)							
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
Total Program Element	0.000	2.943	2.935	0.000	2.935	5.876	6.858	9.746	9.715	Continuing	Continuing
635351: Technology Sustainment	0.000	2.943	2.935	0.000	2.935	5.876	6.858	9.746	9.715	Continuing	Continuing

Note

Note: This program represents increased emphasis on sustainment technologies previously addressed within the individual S&T programs and is not a new start.

A. Mission Description and Budget Item Justification

This program develops and demonstrates sustainment technologies for transition into Air Force systems to increase readiness and reduce life cycle costs. Technologies matured and demonstrated in this program impact affordability and availability of fielded and future aerospace weapon systems by extending service life, ensuring flight safety, reducing sustainment costs, and ensuring mission readiness and capability. This program develops and demonstrates technologies that can be implemented to address operational sustainment issues on existing systems as well as supports new system sustainability through demonstration of technologies related to robust life cycle management, system design, fleet management decision making, and mission capability. Studies are conducted to identify and analyze design methodologies that focus on "building" in sustainability into future applications.

This program is in Budget Activity 3, Advanced Technology Development, since it develops and demonstrates technologies for sustainment of existing and future aerospace vehicle system upgrades and/or new system developments that have military utility and address warfighter needs.

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APPROPRIATION/BUDGET ACTIVITY		R-1 ITEM NOMENCLATURE			
3600: Research, Development, Test & Evaluation, Air Force		PE 0603199F: Sustainment Science and Technology (S&T)			
BA 3: Advanced Technology Development (ATD)					
B. Program Change Summary (\$ in Millions)					
	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	0.000	2.955	0.000	0.000	0.000
Current President's Budget	0.000	2.943	2.935	0.000	2.935
Total Adjustments	0.000	-0.012	2.935	0.000	2.935
• Congressional General Reductions		0.000			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	-0.012			
• Congressional Adds		0.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	2.935	0.000	2.935
Change Summary Explanation					
The FY 2010 President's Budget submittal did not reflect FY 2011 through FY 2015 funding. A detailed explanation of changes between the two budget positions is not provided because it cannot be made in a relevant manner.					
(U) C. Performance Metrics Under Development					

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2011 Air Force								<b>DATE:</b> February 2010			
<b>APPROPRIATION/BUDGET ACTIVITY</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force</i> BA 3: <i>Advanced Technology Development (ATD)</i>				<b>R-1 ITEM NOMENCLATURE</b> PE 0603199F: <i>Sustainment Science and Technology (S&amp;T)</i>				<b>PROJECT</b> 635351: <i>Technology Sustainment</i>			
<b>COST (\$ in Millions)</b>	<b>FY 2009 Actual</b>	<b>FY 2010 Estimate</b>	<b>FY 2011 Base Estimate</b>	<b>FY 2011 OCO Estimate</b>	<b>FY 2011 Total Estimate</b>	<b>FY 2012 Estimate</b>	<b>FY 2013 Estimate</b>	<b>FY 2014 Estimate</b>	<b>FY 2015 Estimate</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
635351: <i>Technology Sustainment</i>	0.000	2.943	2.935	0.000	2.935	5.876	6.858	9.746	9.715	Continuing	Continuing

## Note

Note: This program represents increased emphasis on sustainment technologies previously addressed within the individual S&T programs and is not a new start.

## A. Mission Description and Budget Item Justification

This program develops and demonstrates sustainment technologies for transition into Air Force systems to increase readiness and reduce life cycle costs. Technologies matured and demonstrated in this program impact affordability and availability of fielded and future aerospace weapon systems by extending service life, ensuring flight safety, reducing sustainment costs, and ensuring mission readiness and capability. This program develops and demonstrates technologies that can be implemented to address operational sustainment issues on existing systems as well as supports new system sustainability through demonstration of technologies related to robust life cycle management, system design, fleet management decision making, and mission capability. Studies are conducted to identify and analyze design methodologies that focus on "building" in sustainability into future applications.

This program is in Budget Activity 3, Advanced Technology Development, since it develops and demonstrates technologies for sustainment of existing and future aerospace vehicle system upgrades and/or new system developments that have military utility and address warfighter needs.

## B. Accomplishments/Planned Program (\$ in Millions)

	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011 Base</b>	<b>FY 2011 OCO</b>	<b>FY 2011 Total</b>
MAJOR THRUST: Develop, demonstrate, and transition system health prediction technologies. Conduct studies and analyses to "design" in sustainability into future applications.  <i>FY 2009 Accomplishments:</i> In FY 2009: Not Applicable.  <i>FY 2010 Plans:</i> In FY 2010: Develop and demonstrate fatigue/corrosion diagnostics sensors and algorithms for interpreting sensor data. Verify capability of state of the art reasoners to assess component	0.000	1.473	1.475	0.000	1.475

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
health. Verify and validate real time material state awareness capability for turbine engine and airframe structural components. Demonstrate real time diagnostic technologies and develop life prediction model capability to support risk-based decision making and prognostics. Incorporate health assessment technologies into system data environment.  FY 2011 Base Plans: In FY 2011: Continue to develop and demonstrate fatigue/corrosion diagnostics sensors and algorithms for interpreting sensor data. Verify capability of state of the art reasoners to assess component health. Expand efforts to verify and validated real time material state awareness capability for engine and airframe structural components. Continue to demonstrate real time diagnostic technologies and develop life prediction model capability to support risk based decision making and prognostics. Incorporate health assessment technologies into system data environment.  FY 2011 OCO Plans: In FY 2011 OCO: N/A						
MAJOR THRUST: Develop, demonstrate, and transition technologies to improve component design, maintenance, replacement, and concepts for performance improvement and reduced maintenance burden.  FY 2009 Accomplishments: In FY 2009: Not Applicable.  FY 2010 Plans: In FY 2010: Evaluate low maintenance materials and structural concepts. Integrated structural life enhancement/replacement application concepts. Demonstrate risk-based approach to structural integrity decision making. Demonstrate capability of certification by analysis to reduce design time, implementation, and sustainment costs. Develop technology options to improve sustainability of systems via material substitution, process modification, nondestructive inspection tools, and risk-based modeling and decision making to ensure full system operability, sustainability, and safety.		0.000	0.490	0.480	0.000	0.480

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: In FY 2011: Evaluate low maintenance materials and structural concepts. Integrate structural life enhancement/replacement application concepts. Demonstrate risk-based approach to structural integrity decision making. Demonstrate capability of certification by analysis to reduce design time, implementation, and sustainment costs. Assess technology options to improve sustainability of systems via material substitution, process modification, nondestructive inspection tools, and risk-based modeling and decision making to ensure full system operability, sustainability, and safety.						
FY 2011 OCO Plans: In FY 2011 OCO: N/A						
MAJOR THRUST: Develop, demonstrate, and transition technologies to improve on existing and new components to decrease downtime, costs, and increase reliability.		0.000	0.980	0.980	0.000	0.980
FY 2009 Accomplishments: In FY 2009: Not Applicable.						
FY 2010 Plans: In FY 2010: Develop and demonstrate technologies that directly respond to sustainment needs identified by existing AF systems. Evaluate methods to adjust maintenance, supply, and repair workflow procedures and requirements to improve system availability and reduce the cost of system management and operational sustainment. Demonstrate high reliability maintenance free repair technologies. Demonstrate improved maintenance and repair data base systems. Demonstrate technology solutions for future and existing system maintenance issues.						
FY 2011 Base Plans: In FY 2011: Refine development and demonstration of technologies that directly respond to sustainment needs identified by existing AF systems. Evaluate technological means to adjust maintenance, supply, and repair workflow procedures and requirements to improve system availability						

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<b>B. Accomplishments/Planned Program (\$ in Millions)</b>											
						<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011 Base</b>	<b>FY 2011 OCO</b>	<b>FY 2011 Total</b>	
<p>and reduce the cost of system management and operational sustainment. Demonstrate high reliability maintenance free repair technologies. Demonstrate improved maintenance and repair data base systems. Demonstrate technology solutions for future and existing system maintenance issues.</p> <p><i>FY 2011 OCO Plans:</i> In FY 2011 OCO: N/A</p>											
Accomplishments/Planned Programs Subtotals						0.000	2.943	2.935	0.000	2.935	
<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011 Base</b>	<b>FY 2011 OCO</b>	<b>FY 2011 Total</b>	<b>FY 2012</b>	<b>FY 2013</b>	<b>FY 2014</b>	<b>FY 2015</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• PE 0602201F: <i>Aerospace Vehicle Technologies</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
• PE 0603211F: <i>Aerospace Technology Dev/Demo</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<b>D. Acquisition Strategy</b> Not Applicable.											
<b>E. Performance Metrics</b> 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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