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Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Air Force **DATE:** February 2011

APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMENCLATURE							
3600: <i>Research, Development, Test & Evaluation, Air Force</i> BA 3: <i>Advanced Technology Development (ATD)</i>				PE 0603211F: <i>Aerospace Technology Dev/Demo</i>							
COST (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
Total Program Element	73.589	53.588	67.474	-	67.474	64.058	66.450	68.955	70.107	Continuing	Continuing
63486U: <i>Advanced Aerospace Structures</i>	11.700	-	-	-	-	-	-	-	-	Continuing	Continuing
634920: <i>Flight Vehicle Tech Integration</i>	61.889	53.588	67.474	-	67.474	64.058	66.450	68.955	70.107	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program demonstrates advanced aerospace vehicle technologies. Advanced aerospace structures are demonstrated to enhance the capability of current and future aerospace vehicles. Aerospace vehicle technology integration is accomplished through integration of various technologies to include avionics, advanced propulsion, and weapon systems for demonstration in near-realistic operational environments. Efforts in this program have been coordinated through the Reliance 21 process to harmonize efforts and eliminate duplication. This program is in Budget Activity 3, Advanced Technology Development, since it develops and demonstrates technologies for existing aerospace vehicle system upgrades and/or new system developments that have military utility and address warfighter needs.

B. Program Change Summary (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Previous President's Budget	88.226	53.588	55.562	-	55.562
Current President's Budget	73.589	53.588	67.474	-	67.474
Total Adjustments	-14.637	-	11.912	-	11.912
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-0.002	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	-12.366	-			
• SBIR/STTR Transfer	-2.269	-			
• Other Adjustments	-	-	11.912	-	11.912

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 63486U: *Advanced Aerospace Structures*

Congressional Add: *Big Antennas Small Structures Efficient Tactical Unmanned Air Vehicles.*

Congressional Add: *3D Bais Woven Preform Development.*

Congressional Add: *Long-Loiter, Load Bearing Antenna Platform for Pervasive Airborne Intelligence*

FY 2010	FY 2011
1.593	-
2.390	-
3.983	-

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Congressional Add Details (\$ in Millions, and Includes General Reductions) Congressional Add: <i>Program Increase</i>		Congressional Add Subtotals for Project: 63486U	Congressional Add Totals for all Projects								
		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:50%; padding: 5px;">FY 2010</th> <th style="width:50%; padding: 5px;">FY 2011</th> </tr> <tr> <td style="text-align: center; padding: 5px;">3.734</td> <td style="text-align: center; padding: 5px;">-</td> </tr> <tr> <td style="text-align: center; padding: 5px;">11.700</td> <td style="text-align: center; padding: 5px;">-</td> </tr> <tr> <td style="text-align: center; padding: 5px;">11.700</td> <td style="text-align: center; padding: 5px;">-</td> </tr> </table>	FY 2010	FY 2011	3.734	-	11.700	-	11.700	-	
FY 2010	FY 2011										
3.734	-										
11.700	-										
11.700	-										
Change Summary Explanation Increased funding in FY 2012 and out is due to emphasis being placed on fuel efficiencies and mobility-related efforts involving the X-55 Advanced Composite Cargo Aircraft.											

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APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMENCLATURE				PROJECT			
3600: <i>Research, Development, Test & Evaluation, Air Force</i> BA 3: <i>Advanced Technology Development (ATD)</i>				PE 0603211F: <i>Aerospace Technology Dev/ Demo</i>				63486U: <i>Advanced Aerospace Structures</i>			
COST (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
63486U: <i>Advanced Aerospace Structures</i>	11.700	-	-	-	-	-	-	-	-	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project is used to provide visiability for Congressionally direct efforts related to developing or demonstrating aerospace vehicle technologies.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2010	FY 2011
<i>Congressional Add:</i> Big Antennas Small Structures Efficient Tactical Unmanned Air Vehicles.	1.593	-
<i>FY 2010 Accomplishments:</i> Conducted Congressionally directed effort.		
<i>FY 2011 Plans:</i>		
<i>Congressional Add:</i> 3D Bais Woven Preform Development.	2.390	-
<i>FY 2010 Accomplishments:</i> Conducted Congressionally directed effort.		
<i>FY 2011 Plans:</i>		
<i>Congressional Add:</i> Long-Loiter, Load Bearing Antenna Platform for Pervasive Airborne Intelligence	3.983	-
<i>FY 2010 Accomplishments:</i> Conducted Congressionally directed effort.		
<i>FY 2011 Plans:</i>		
<i>Congressional Add:</i> Program Increase	3.734	-
<i>FY 2010 Accomplishments:</i> Conducted Congressionally directed effort.		
<i>FY 2011 Plans:</i>		
Congressional Adds Subtotals	11.700	-

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Exhibit R-2A, RDT&E Project Justification: PB 2012 Air Force			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: <i>Research, Development, Test & Evaluation, Air Force</i> BA 3: <i>Advanced Technology Development (ATD)</i>	R-1 ITEM NOMENCLATURE PE 0603211F: <i>Aerospace Technology Dev/ Demo</i>	PROJECT 63486U: <i>Advanced Aerospace Structures</i>	

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u> <u>Base</u>	<u>FY 2012</u> <u>OCO</u>	<u>FY 2012</u> <u>Total</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• Activity Not Provided: <i>Not Applicable.</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

D. Acquisition Strategy

Not Applicable.

E. 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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APPROPRIATION/BUDGET ACTIVITY 3600: <i>Research, Development, Test & Evaluation, Air Force</i> BA 3: <i>Advanced Technology Development (ATD)</i>				R-1 ITEM NOMENCLATURE PE 0603211F: <i>Aerospace Technology Dev/ Demo</i>				PROJECT 634920: <i>Flight Vehicle Tech Integration</i>			
COST (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
634920: <i>Flight Vehicle Tech Integration</i>	61.889	53.588	67.474	-	67.474	64.058	66.450	68.955	70.107	Continuing	Continuing
A. Mission Description and Budget Item Justification This project integrates and demonstrates advanced flight vehicle technologies that improve the performance and supportability of existing and future aerospace vehicles. System level integration brings together aerospace vehicle technologies along with avionics, propulsion, and weapon systems for demonstration in a near-realistic operational environment. Integration and technology demonstrations reduce the risk and time required to transition technologies into operational aircraft.											
B. Accomplishments/Planned Programs (\$ in Millions)							FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: Major Thrust 1.							6.963	13.197	13.906	-	13.906
Description: Develop autonomous flight controls for safe flight and cooperative operations between manned and remotely piloted air platforms.											
FY 2010 Accomplishments: Furthered the development and demonstration of situational awareness, autonomous control, and survivability technologies for air vehicles. Continued development and demonstration of cooperative teaming of small unmanned air vehicles in complex, low altitude environments. Continued development of autonomous launch, recovery, and safe airspace interoperability technologies for remotely piloted systems.											
FY 2011 Plans: Further the development and demonstration process for situational awareness, autonomous control, and survivability technologies. Continue efforts for cooperative teaming of small remotely piloted aircraft in complex, low altitude environments. Continue development of autonomous launch and safe airspace interoperability technologies for multiple remotely piloted systems.											
FY 2012 Base Plans: Develop and demonstrate technologies that provide situational awareness, autonomous control, and survivability for remotely piloted systems and manned platforms. Continue efforts for cooperative teaming of small remotely piloted platforms in complex, low altitude environments. Initiate testing of advanced control systems. Continue development of autonomous launch and safe airspace interoperability technologies for multiple remotely piloted systems.											
FY 2012 OCO Plans:											

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B. Accomplishments/Planned Programs (\$ in Millions)				FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: Major Thrust 2. Description: Develop, simulate, and demonstrate integrated technologies to improve the performance of aerospace platform capabilities. FY 2010 Accomplishments: Developed and demonstrated flow control for reducing acoustic loading and enhancing weapon separation from future strike platforms. Developed a simulation environment for evaluating network centric technologies. Conducted flight demonstration efforts of an X-type cargo aircraft. FY 2011 Plans: Continue work to develop and demonstrate flow control for reducing acoustic loading and enhancing weapon separation from future strike platforms. FY 2012 Base Plans: Continue work to develop and demonstrate flow control for reducing acoustic loading and enhancing weapon separation from future strike platforms. Continue development efforts for cargo type platforms. Initiate combined inlet and large bypass ratio fan demonstration. FY 2012 OCO Plans:				25.960	0.567	11.680	-	11.680
Title: Major Thrust 3. Description: Develop aircraft structures that have embedded components, which have previously been separate components that were attached to the air platforms. FY 2010 Accomplishments: Completed assessment of flight demonstration of the large X-band electronically scanned antenna array embedded in a load-bearing structure. Assessed results of ultra lightweight multi-functional airframes. Demonstrated key high altitude persistent Intelligence, Surveillance, and Reconnaissance technologies. FY 2011 Plans: Complete assessment of test results for electronically scanned antenna array embedded in a load-bearing structure. Flight test of antenna integration into load-bearing structures. Initiate demonstration efforts for				12.422	21.204	22.169	-	22.169

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
reliability of unitized multi-role structures. Demonstrate key high altitude persistent Intelligence, Surveillance, and Reconnaissance technologies. FY 2012 Base Plans: Flight test of antenna integration into load-bearing structures. Initiate demonstration efforts for reliability of unitized multi-role structures. Demonstrate key high altitude persistent Intelligence, Surveillance, and Reconnaissance technologies. FY 2012 OCO Plans:						
Title: Major Thrust 4. Description: Develop adaptive structures to provide in-flight modifications offering improved performance. FY 2010 Accomplishments: Demonstrated thermal protection systems for leading edge of high-speed vehicle components. Continued assessment of advanced efficient wing concepts. Demonstrated reusable hypersonic vehicle integrated structural health management technologies. FY 2011 Plans: Further demonstrate technologies necessary for reusable hypersonic vehicles. Assess integrated structural health management for lightweight remotely piloted air vehicles from subsonic to hypersonic speeds. Develop and assess detailed integrated flight and ground systems concepts for operationally responsive space lift. FY 2012 Base Plans: Further demonstrate technologies necessary for reusable hypersonic vehicles. Assess integrated structural health management for lightweight remotely piloted air vehicles from subsonic to hypersonic speeds. Develop and assess detailed integrated flight and ground systems concepts for operationally responsive space lift. FY 2012 OCO Plans:		13.190	11.064	11.627	-	11.627
Title: Major Thrust 5. Description: Develop, simulate, and demonstrate integrated technologies to enable, and improve the performance of high-speed and hypersonic air vehicles. FY 2010 Accomplishments:		3.354	7.556	8.092	-	8.092

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
<p>Developed and demonstrated hypersonic ablation shape-change measurement and prediction capabilities. Conducted risk reduction research in the areas of aeromechanics, propulsion integration, controls, and hot structures.</p> <p><i>FY 2011 Plans:</i> Continue efforts related hypersonic ablation /shape-change measurement. Initiate work for expendable and reusable hypersonic air-breathing concepts.</p> <p><i>FY 2012 Base Plans:</i> Continue efforts related to hypersonic ablation /shape-change measurement and prediction capabilities. Conduct hypersonic flight experiments. Continue efforts to study potential applications for utilizing high speed vehicles in ISR and strike missions.</p> <p><i>FY 2012 OCO Plans:</i></p>					
Accomplishments/Planned Programs Subtotals	61.889	53.588	67.474	-	67.474

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012 Base</u>	<u>FY 2012 OCO</u>	<u>FY 2012 Total</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• Activity Not Provided: <i>Title Not Provided</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

D. Acquisition Strategy
Not Applicable.

E. 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.