Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Air Force											Date: March 2014	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 3: *Advanced Technology Development (ATD)*					R-1 Program Element (Number/Name) PE 0603211F / *Aerospace Technology Dev/Demo*							
COST ($ in Millions)	**Prior Years**	**FY 2013**	**FY 2014**	**FY 2015 Base**	**FY 2015 OCO #**	**FY 2015 Total**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**	**Cost To Complete**	**Total Cost**
Total Program Element	-	72.462	77.329	91.062	-	91.062	99.103	61.957	75.937	77.975	Continuing	Continuing
634920: *Flight Vehicle Tech Integration*	-	72.462	77.329	5.665	-	5.665	23.651	15.010	19.910	20.050	Continuing	Continuing
634926: *High Speed/Hypersonic Intgr and Demo*	-	-	-	67.017	-	67.017	51.037	32.557	39.104	38.204	Continuing	Continuing
634927: *Flight Systems Control*	-	-	-	18.380	-	18.380	24.415	14.390	16.923	19.721	Continuing	Continuing

The FY 2015 OCO Request will be submitted at a later date.

A. Mission Description and Budget Item Justification

In FY 2015, this program has two new projects, High Speed/Hypersonic Integration and Demonstration and Flight Systems Control. These projects support Department of Defense (DoD) priorities for demonstrations in hypersonics and unmanned systems, respectively.

This program 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. Efforts in this program have been coordinated through the Department of Defense (DoD) science and Technology (S&T) Executive Committee process to harmonize efforts and eliminate duplication. This program is in Budget activity 3, Advanced Technology Development, since it enables and demonstrates technologies for existing aerospace system upgrades and/or new and future aerospace system developments that have military utility and address warfighter needs.

B. Program Change Summary ($ in Millions)	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO	FY 2015 Total
Previous President's Budget	81.376	77.347	82.305	-	82.305
Current President's Budget	72.462	77.329	91.062	-	91.062
Total Adjustments	-8.914	-0.018	8.757	-	8.757
• Congressional General Reductions	-0.107	-0.018			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.101	-			
• Other Adjustments	-6.706	-	8.757	-	8.757

Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Air Force	Date: March 2014
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603211F / *Aerospace Technology Dev/Demo*

Change Summary Explanation

Decrease in FY 2013 Other Adjustments was due to Sequestration.

Increase in FY 2015 due to increase emphasis in hypersonic and autonomous systems control research.

Exhibit R-2A, RDT&E Project Justification: PB 2015 Air Force			Date: March 2014
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603211F / *Aerospace Technology Dev/ Demo*	Project (Number/Name) 634920 / *Flight Vehicle Tech Integration*	

COST ($ in Millions)	Prior Years	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO #	FY 2015 Total	FY 2016	FY 2017	FY 2018	FY 2019	Cost To Complete	Total Cost
634920: *Flight Vehicle Tech Integration*	-	72.462	77.329	5.665	-	5.665	23.651	15.010	19.910	20.050	Continuing	Continuing

The FY 2015 OCO Request will be submitted at a later date.

A. Mission Description and Budget Item Justification

This project demonstrates advanced aerospace vehicle technologies. Aerospace Vehicle Technology Integration efforts are accomplished through integration of various technologies to include avionics, advanced propulsion, and weapon systems for demonstration in near-realistic operational environments. Advanced Aerospace Structures Technologies are demonstrated to enhance the capability of current and future aerospace vehicles.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
Title: Flight Systems Controls	1.916	3.556	-
Description: Integrates and demonstrates advanced control technologies that improve the performance, reliability, safety, and survivability of manned and unmanned, aerospace systems. Enhanced capabilities are enabled by control, automation, and system level integration of subsystems and systems such as propulsion, airframes, avionics, power, weapons, communications, and operator interfaces. Modeling and simulation, integration, and technology demonstrations in a near-operational environment reduce the risk and time required to transition technologies into existing and future aerospace systems. ***FY 2013 Accomplishments:*** Continued development and demonstration of technologies for situational awareness, autonomous control, and survivability for unmanned systems and manned platforms. Demonstrated cooperative teaming of small unmanned platforms in complex, low altitude environments. Demonstrated autonomous launch and safe airspace interoperability for multiple remotely piloted aircraft (RPA) systems. ***FY 2014 Plans:*** Continue to develop and demonstrate technologies for situational awareness, autonomous control, and survivability for unmanned systems and manned platforms. Demonstrate airborne control of small unmanned platforms in complex, low altitude environments. Continue demonstration of autonomous and safe airspace interoperability for manned and RPA systems. ***FY 2015 Plans:*** Starting in FY 2015, efforts and funding in this area will be transferred to new project 634927, Flight Systems Control.			
Title: Aerospace Vehicle Technology Integration	54.798	20.952	1.607

Exhibit R-2A, RDT&E Project Justification: PB 2015 Air Force		Date: March 2014
Appropriation/Budget Activity 3600 / 3	**R-1 Program Element (Number/Name)** PE 0603211F / *Aerospace Technology Dev/ Demo*	**Project (Number/Name)** 634920 / *Flight Vehicle Tech Integration*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
Description: This title changed from Enhanced Platform Capabilities to Aerospace Vehicle Technology Integration to better reflect the content and objectives. Develop, simulate, and demonstrate integrated technologies to improve the performance of aerospace platform capabilities. ***FY 2013 Accomplishments:*** Completed lightweight composite structures ground experiment demonstration. Initiated technology efforts for precision air delivery capability for legacy mobility aircraft by reducing tracking errors and better integration of airdrop technologies. Matured adaptive turbine engine technologies for advanced air vehicles. Continued combined inlet and large bypass ratio fan demonstration. Began demonstration of large cargo aircraft in formation flight for fuel burn reduction to support transition decision. Began flight validation safety and operational compatibility of C-130 aircraft with aft body drag reduction devices. ***FY 2014 Plans:*** Further efforts for precision air delivery capability for legacy mobility aircraft by reducing tracking errors and better integration of airdrop technologies. Further development of advanced engine system design integration to mature adaptive turbine engine technologies for advanced air vehicles along with thrust augmentors and exhaust systems to provide technical options for highly fuel-efficient engines. Complete demonstration of large cargo aircraft in formation flight for fuel burn reduction to support transition decision. Complete flight safety validation and operational compatibility of C-130 aircraft with aft body drag reduction devices. ***FY 2015 Plans:*** Initiate C-17 formation flight Advanced Technology Demonstration. Initiate feasibility flight test of C-17 aircraft with aft body drag reduction devices. Continue to improve accuracy, situational awareness, and safety for air drop operations.			
Title: Advanced Aerospace Structure Technologies ***Description:*** This title changed from Multi-Role Structure Technologies to Advanced Aerospace Structure Technologies to better reflect the content and objectives. Develop and demonstrate affordable lightweight, adaptive, and multifunctional structural concepts integrated into aerospace systems. ***FY 2013 Accomplishments:*** Continued flight test of antenna integration into load-bearing structures. Completed demonstrations of key high altitude persistent intelligence, surveillance and reconnaissance (ISR) technologies. Completed demonstration of low band structurally integrated arrays and persistent multi-intelligence platforms. Developed passive flow control improvements for enhanced aero efficiency of legacy aircraft. ***FY 2014 Plans:***	8.835	8.615	4.058

Exhibit R-2A, RDT&E Project Justification: PB 2015 Air Force		Date: March 2014
Appropriation/Budget Activity 3600 / 3	**R-1 Program Element (Number/Name)** PE 0603211F / *Aerospace Technology Dev/ Demo*	**Project (Number/Name)** 634920 / *Flight Vehicle Tech Integration*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
Continue flight test of directional finding communication antenna integration technology demonstration into load-bearing structures for small remotely piloted aircraft (RPA). Continue flight technology demonstrations of key high altitude persistent ISR for active flutter suppression, gust load alleviation, and adaptive, multi-purpose wing surfaces. ***FY 2015 Plans:*** Complete flight test of directional finding communication antenna integration technology demonstration into load-bearing structures for small RPA. Complete flight technology demonstrations of key high altitude persistent ISR for active flutter suppression, gust load alleviation, and adaptive, multi-purpose wing surfaces.			
Title: Adaptive Structure Technologies ***Description:*** Develop technologies for adaptive structures to provide in-flight modifications offering improved performance. Starting in FY14 this effort moves to thrust Advanced Aerospace Structures Technologies, same Program and Project. ***FY 2013 Accomplishments:*** Completed the development of integrated system health management and adaptive guidance and control technologies for aerospace vehicles. Completed structural health management ground technology demonstration for reusable space access vehicle. ***FY 2014 Plans:*** Starting in FY 2014, efforts and funding in this area will be transferred to Advanced Aerospace Structure Technologies thrust, in this project, to realign and consolidate complimentary efforts. ***FY 2015 Plans:*** N/A	1.058	-	-
Title: High Speed/Hypersonic Vehicle Technologies ***Description:*** This thrust moves to project 634926, High Speed/Hypersonic Integration and Demostration in FY15. Develops, integrates and demonstrates, via simulations, ground, and flight tests, advanced flight vehicle technologies that improve the performance and supportability of future high speed/hypersonic vehicles. System level integration brings together air vehicle technologies along with avionics, propulsion, and warheads and other aerospace subsystems for demonstration in a near-realistic operational environment. Integration and technology demonstrations reduce the risk and time required to transition technologies into operational systems. ***FY 2013 Accomplishments:***	5.855	44.206	-

Exhibit R-2A, RDT&E Project Justification: PB 2015 Air Force		Date: March 2014
Appropriation/Budget Activity 3600 / 3	**R-1 Program Element (Number/Name)** PE 0603211F / *Aerospace Technology Dev/ Demo*	**Project (Number/Name)** 634920 / *Flight Vehicle Tech Integration*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
Completed flight demonstration of technologies applicable to reusable hypersonic vehicles and high-speed weapons and weapon systems. Continued to advance high temperature materials and structures for hypersonic vehicles. Continued small scale flight testing of high-speed flying experiments. ***FY 2014 Plans:*** Begin accelerated development and demonstration of tactically-relevant long range high speed strike technologies including ground and flight demonstrations needed for potential follow-on acquisition program. Effort builds upon successful scramjet engine demonstration under the X-51A program. Increase in FY14 also supports high speed/hypersonics testing support and continues to advance high temperature materials and structures for hypersonic vehicles. ***FY 2015 Plans:*** Starting in FY 2015, efforts and funding in this area will be transferred to new project 634926, High Speed/Hypersonic Integration and Demonstration.			
Accomplishments/Planned Programs Subtotals	72.462	77.329	5.665

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

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.

Exhibit R-2A, RDT&E Project Justification: PB 2015 Air Force			Date: March 2014
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603211F / *Aerospace Technology Dev/ Demo*	Project (Number/Name) 634926 / *High Speed/Hypersonic Intgr and Demo*	

COST ($ in Millions)	Prior Years	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO #	FY 2015 Total	FY 2016	FY 2017	FY 2018	FY 2019	Cost To Complete	Total Cost
634926: *High Speed/Hypersonic Intgr and Demo*	-	-	-	67.017	-	67.017	51.037	32.557	39.104	38.204	Continuing	Continuing

The FY 2015 OCO Request will be submitted at a later date.

Note

This is a new project starting in FY 2015 with scope and funding re-aligned from project 634920, Flight Vehicle Technology Integration, to support DoD priorities in hypersonics demonstration. This project integrates advanced technologies such as avionics, propulsion, and other subsystems in simulations, ground tests, and flight tests to validate and demonstrate vehicle performance and other capabilities in environments relevant to or realistically representative of operational missions. These activities and efforts enable low-risk and rapid transition to acquisition programs for near-term weapons systems and development and demonstration of far-term re-usable platforms.

A. Mission Description and Budget Item Justification

This project develops, integrates and demonstrates, via simulations, ground, and flight tests, advanced flight vehicle technologies that improve the performance and supportability of future high speed/hypersonic vehicles. System level integration brings together air vehicle technologies along with avionics, propulsion, and warheads and other aerospace subsystems for demonstration in a near-realistic operational environment. Integration and technology demonstrations reduce the risk and time required to transition technologies into operational systems.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
Title: High Speed/Hypersonic Vehicle Technologies	-	-	67.017
Description: Develop, simulate and demonstrate integrated vehicle technologies to enable and improve the performance of future high-speed and hypersonic systems. ***FY 2013 Accomplishments:*** N/A ***FY 2014 Plans:*** N/A ***FY 2015 Plans:*** Continue accelerated development and demonstration of tactically-relevant long range high speed strike technologies including ground and flight demonstrations needed for potential follow-on acquisition program. Continue advancement of high temperature materials and structures for hypersonic vehicles.			
Accomplishments/Planned Programs Subtotals	-	-	67.017

Exhibit R-2A, RDT&E Project Justification: PB 2015 Air Force		Date: March 2014
Appropriation/Budget Activity 3600 / 3	**R-1 Program Element (Number/Name)** PE 0603211F / *Aerospace Technology Dev/ Demo*	**Project (Number/Name)** 634926 / *High Speed/Hypersonic Intgr and Demo*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

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.

Exhibit R-2A, RDT&E Project Justification: PB 2015 Air Force			Date: March 2014
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603211F / *Aerospace Technology Dev/ Demo*	Project (Number/Name) 634927 / *Flight Systems Control*	

COST ($ in Millions)	Prior Years	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO #	FY 2015 Total	FY 2016	FY 2017	FY 2018	FY 2019	Cost To Complete	Total Cost
634927: *Flight Systems Control*	-	-	-	18.380	-	18.380	24.415	14.390	16.923	19.721	Continuing	Continuing

The FY 2015 OCO Request will be submitted at a later date.

Note

This is a new project starting in FY 2015 with scope and funding re-aligned from project 634920, Flight Vehicle Technology Integration, to support DoD priorities in unmanned systems demonstrations.

A. Mission Description and Budget Item Justification

This program integrates and demonstrates advanced control technologies that improve the performance, reliability, safety, and survivability of existing and future, manned and unmanned, aerospace systems. Enhanced capabilities are enabled by control, automation, and system level integration of subsystems and systems such as propulsion, airframes, avionics, power, weapons, communications, and operator interfaces. Modeling and simulation, integration, and technology demonstrations in a near-operational environment reduce the risk and time required to transition technologies into existing and future aerospace systems.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
Title: Autonomous Systems Control	-	-	18.380
Description: Develop, simulate, and demonstrate advanced automation- and control-enabled capabilities for manned or unmanned aerospace platforms. Develop, simulate, and demonstrate autonomous flight controls for safe flight and cooperative operations between manned and remotely piloted air platforms. ***FY 2013 Accomplishments:*** N/A ***FY 2014 Plans:*** N/A ***FY 2015 Plans:*** Further development and demonstration of technologies for situational awareness, autonomous control, and survivability for unmanned systems and manned platforms. Continue demonstration of autonomous and safe airspace interoperability for manned and RPA systems. Continue development and demonstration of airborne control of teams of unmanned aircraft. Continue development and demonstration of improved accuracy, situational awareness, and safety for air drop operations.			
Accomplishments/Planned Programs Subtotals	-	-	18.380

Exhibit R-2A, RDT&E Project Justification: PB 2015 Air Force		Date: March 2014
Appropriation/Budget Activity 3600 / 3	**R-1 Program Element (Number/Name)** PE 0603211F / *Aerospace Technology Dev/ Demo*	**Project (Number/Name)** 634927 / *Flight Systems Control*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

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.