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 I* BA 7: *Operational Systems Development*						**R-1 Program Element (Number/Name)** PE 0207449F *I Command and Control (C2) Constellation*						
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	-	7.418	-	-	-	-	-	-	-	-	-	7.418
675078: *Horizontal Integration*	-	7.418	-	-	-	-	-	-	-	-	-	7.418

Note

In FY 2014, Project 675078, Horizontal Integration, was completed.

A. Mission Description and Budget Item Justification

The Command and Control Constellation (C2C) is the sole Air Force program for defining, developing, and assessing integrated effects of global, theater and tactical level Air Force air, space, and cyber command and control (C2) capabilities in support of the joint warfighter. The Air Force faces a complex future where conflict will range across a broad spectrum of operations and lethality requiring capabilities with the maximum possible flexibility to deal with the widest possible range of conflict.

The C2C is the enabling program element for C2 Integration/Modernization. The Air Force is working to establish a C2 framework and architecture to be used as a unifying vision of command and control for each of the services core functions. C2C supports the defense strategy through: integration of air; space cyber and intelligence, surveillance, and reconnaissance (ISR); architectural analysis; prototyping; experimentation and innovation to develop cross-cutting solutions to enable an improved "sense-to-kill" cycle time. C2C innovations and experimentation provide strategic, operational, and tactical direction for Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel and Facilities (DOTMLPF) solutions to facilitate an integrated mission environment to support C2 planning and execution for air, space, and cyberspace. C2C also provides an in-depth development and analyses of C2 operational systems and technical architectures geared towards identifying capability gaps, identifying required "to be" information services, and evaluating C2 program planned improvements. Through prototyping and experimentation, C2C integrates rapidly developing technologies to promote common standards, data sharing, and information services across the Air Force and joint warfighting applications in the support of joint enterprise solutions.

Project 5078, Horizontal Integration (HI) conducts DOTMLPF analyses and assessments to guide cross-cutting, C2 sub-enterprise and cyberspace investment decisions that integrate USAF capabilities into joint and coalition operations. HI identifies, prioritizes and develops requirements, and horizontally integrates solution recommendations to ensure that the latest technologies and information services are integrated into a cross cutting C2 systems across all warfighter domains. The HI strategy will be validated by Headquarters, Air Force (HAF) to ensure that initiatives are harmonized with the most urgent warfighter needs described by the C2 Capability Assessment Team (CAT), C2 Core Function Master Plan (CFMP) that support the 2012 Air Force, Joint and Defense Strategies and Operational Concepts. Once validated, HI funds are applied towards identifying the most critical warfighter capabilities to ensure they are horizontally integrated into both Air Force and joint C2 programs of record.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

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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 I* BA 7: *Operational Systems Development*			**R-1 Program Element (Number/Name)** PE 0207449F *I Command and Control (C2) Constellation*		

B. Program Change Summary ($ in Millions)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Previous President's Budget	7.160	-	-	-	-
Current President's Budget	7.418	-	-	-	-
Total Adjustments	0.258	-	-	-	-
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	0.500	-			
• SBIR/STTR Transfer	-0.242	-			
• Other Adjustments	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2016 Air Force										Date: February 2015	
Appropriation/Budget Activity 3600 *I* 7				**R-1 Program Element (Number/Name)** PE 0207449F *I Command and Control (C2) Constellation*					**Project (Number/Name)** 675078 *I Horizontal Integration*		
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**
675078: *Horizontal Integration*	-	7.418	-	-	-	-	-	-	-	-	-	7.418
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2014, Project 675078, Horizontal Integration, was completed.

A. Mission Description and Budget Item Justification

Horizontal Integration (HI) develops an integrated mission environment that supports cross-cutting solutions across the air, space, and cyberspace command and control (C2) warfighter domain. HI activities include: requirements, architecture, systems engineering, technology development, risk reduction, prototyping, and transition. These activities are required to: identify, design, develop, experiment, and implement C2 solutions supporting operational requirements for warfighting integration and interoperability needs which are not the sole responsibility of a specific program of record.

The nature of integrated and interoperable C2 warfighting capabilities spans multiple platforms and domains. These capabilities are routinely being adjusted to meet the changing requirements from the warfighting communities. The HI project is uniquely designed to look across platforms and domains enabling the Air Force to respond to operator needs across the seams of individual systems. These horizontal integration initiatives will be prototyped, assessed, appropriately captured in requirements documents and then transitioned to programs of record for production, fielding and sustainment.

Systems Engineering and analysis is the 'glue' that holds command and control constellation (C2C) elements together and closes the seams in the C2 architectures. Capability analysis identifies areas where interoperability can be improved within the Air Force, as well as among joint services, and coalition partners. Once capability issues are identified, they are prioritized and pilot initiatives are developed to provide solutions to the warfighter challenges to resolve the capability gaps. The HI project also helps to competitively prototype integrated solutions against validated program requirements.

The benefits of these activities are two-fold: the operational community is able to weigh the cost, risk, and performance trade-offs between enterprise solutions versus program centric solutions, and it supports competitive prototyping of all acquisition programs. The synchronization of HI prototyping and program milestone requirements offers an effective environment for increasing interoperability while reducing the impact of this policy on multiple programs. An infrastructure environment manages a continuous distributed operational environment that supports air, space, and cyberspace C2 and rapid acquisition, prototyping, development, integration, and fielding. C2 initiatives may use this infrastructure to mature their development status prior to entry into operational and technical suitability assessment.

The HI prototype performances are assessed for operational utility, and the most promising initiatives/technologies will be matured and transitioned into weapon system configuration control baselines. Requirement documents will be published and revised, and a requirements database and implementation plan identifying the most significant C2C net-centric integration issues will be updated to catalog the activities necessary to accomplish this integration.

Exhibit R-2A, RDT&E Project Justification: PB 2016 Air Force		Date: February 2015
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207449F / Command and Control (C2) Constellation	Project (Number/Name) 675078 / Horizontal Integration

In addition, this project supports concept exploration, program definition/risk reduction efforts, and studies that support continuous improvements in C2. Guided by the Major Commands (MAJCOM) validated C2 capability gaps developed by the HI Capability Assessment Team annual process and the defense strategy to meet the evolving Anti-Access/Area Denial (A2/AD) threats to air, space and cyber C2 operations, these improvements include but are not limited to: integration of airspace and cross-domain synchronized operations, C2 of integrated air and missile defense, C2 of Air Force Forces and agile combat support, dynamic aerial network capabilities, and Non-Traditional ISR (NTISR), from 4th and 5th generation aircraft through processing and assessment, and interoperability with joint service, allied and coalition systems, C2 of personnel recovery, and air-sea battle. Activities also include studies and analysis to support current program planning and execution, as well as future program planning.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Title: Requirements/CBP/Integrated Ops/ C2 Framework	1.922	-	-	-	-
Description: Provides requirements and Capabilities Based Planning (CBP) **FY 2014 Accomplishments:** - Analyzed, developed, and documented emerging Air Force (AF) integrated command and control (C2) requirements. - Completed the C2 integration and modernization strategy in a series of concept and/or capability development and technology exploration activities designed to integrate C2 operations across air, space, and cyberspace domains; completed the refinement of Integrated Air and Missile Defense (IAMD) C2 requirements. **FY 2015 Plans:** N/A **FY 2016 Base Plans:** N/A **FY 2016 OCO Plans:** N/A					
Title: Arch and SE	1.605	-	-	-	-
Description: Provides architecture development and systems engineering **FY 2014 Accomplishments:** - Completed the functional and systems engineering analyses within the C2 community that fleshed out technical architectures and their relationships to operational architectures within the warfighting environment. - Specific focus areas and efforts depended on real world needs, C2 enterprise and C2 of cyber requirements, with emphasis on: airspace and C2 integration, kinetic/non-kinetic integration, NTISR, C2 of IAMD, 5th-4th					

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Air Force		Date: February 2015
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207449F / Command and Control (C2) Constellation	**Project (Number/Name)** 675078 / Horizontal Integration

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
generation fighter interoperability, dynamic aerial networks, C2 of personnel recovery, air sea battle, electromagnetic spectrum, forward base defense, tactical edge/electronic warfare situation awareness, PACAF distributed control concept/mission planning at unit level, and the dynamic execution at distance/net-enabled weapons. ***FY 2015 Plans:*** N/A ***FY 2016 Base Plans:*** N/A ***FY 2016 OCO Plans:*** N/A					
Title: HI Solutions Assessments ***Description:*** Provides horizontal integration solutions assessment ***FY 2014 Accomplishments:*** - Fostered HI enterprise integration across Command and Control (C2), supported the requirements of competitive prototyping, and aided in the refinement of requirements. - Key criteria were near term warfighter impacts and the likelihood to transition. The initiatives focused on: C2 Integration, C2 of Integrated Air & Missile Defense, Agile Combat Support/Space C2, 5th-4th Generation Fighter Interoperability, Airspace Management, Dynamic Aerial Networks, C2 of personnel recovery, and Non-traditional, Intelligence, Surveillance and Reconnaissance. ***FY 2015 Plans:*** N/A ***FY 2016 Base Plans:*** N/A ***FY 2016 OCO Plans:*** N/A	3.891	-	-	-	-
Accomplishments/Planned Programs Subtotals	7.418	-	-	-	-

Exhibit R-2A, **RDT&E Project Justification:** PB 2016 Air Force		**Date:** February 2015
Appropriation/Budget Activity 3600 *I* 7	**R-1 Program Element (Number/Name)** PE 0207449F *I Command and Control (C2) Constellation*	**Project (Number/Name)** 675078 *I Horizontal Integration*

C. Other Program Funding Summary ($ in Millions)

 N/A

Remarks

D. Acquisition Strategy

 This project uses full and open competition for operational requirements document creation, systems engineering & architecture development, modeling & simulation and experimentation, joint interoperability/integration, and horizontal integration approaches.

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-3, RDT&E Project Cost Analysis: PB 2016 Air Force				Date: February 2015	
Appropriation/Budget Activity 3600 / 7			**R-1 Program Element (Number/Name)** PE 0207449F / Command and Control (C2) Constellation	**Project (Number/Name)** 675078 / Horizontal Integration	

Product Development ($ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total			
Cost Category Item	**Contract Method & Type**	**Performing Activity & Location**	**Prior Years**	**Cost**	**Award Date**	**Cost**	**Award Date**	**Cost**	**Award Date**	**Cost**	**Award Date**	**Cost**	**Cost To Complete**	**Total Cost**	**Target Value of Contract**
Requirements/Capability Based Planning (CBP)	C/CPFF	Northrop Grumman : Langley AFB, VA	-	1.884	Dec 2013	-		-		-		-	Continuing	Continuing	-
Requirements/Capability Based Planning (CBP)(2)	C/CPFF	BAE : Rome, NY	-	0.122	Oct 2013	-		-		-		-	Continuing	Continuing	-
Architecture Development and Systems Engineering/ GAPS/AWS Horizontal Integration	C/FFP	MITRE : Hanscom AFB, MA	-	0.152	Nov 2013	-		-		-		-	Continuing	Continuing	-
Architecture Development and Systems Engineering/ GAPS/AWS Horizontal Integration (2)	C/FFP	Northrop Grumman : Langley AFB, VA	-	0.501	Dec 2013	-		-		-		-	Continuing	Continuing	-
Architecture Development and Systems Engineering/ GAPS/AWS Horizontal Integration (3)	C/CPFF	Northrup Grumman : Rome, NY	-	0.952	Oct 2013	-		-		-		-	Continuing	Continuing	-
Horizontal Integration Solution Assessment (1)	C/FFP	MITRE : Hanscom AFB, MA	-	1.631	Oct 2013	-		-		-		-	Continuing	Continuing	-
Horizontal Integration Solution Assessment (2)	C/FFP	Jacobs ETASS : Hanscom AFB, MA	-	0.086	Jan 2014	-		-		-		-	Continuing	Continuing	-
Horizontal Integration Solution Assessment	C/Various	Various : Hanscom AFB, MA	-	1.491	Dec 2013	-		-		-		-	Continuing	Continuing	-
Subtotal			-	6.819		-		-		-		-	-	-	-

Support ($ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total			
Cost Category Item	**Contract Method & Type**	**Performing Activity & Location**	**Prior Years**	**Cost**	**Award Date**	**Cost**	**Award Date**	**Cost**	**Award Date**	**Cost**	**Award Date**	**Cost**	**Cost To Complete**	**Total Cost**	**Target Value of Contract**
Subtotal			-	-		-		-		-		-	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Air Force		Date: February 2015

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207449F / Command and Control (C2) Constellation	Project (Number/Name) 675078 / Horizontal Integration

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			-	-		-		-		-		-	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support/PMA-1	C/FFP	Quantech PASS : Hanscom AFB, MA	-	0.248	Jan 2014	-		-		-		-	Continuing	Continuing	-
Program Management Support/PMA-2	C/FFP	Jacobs ETASS : Hanscom AFB, MA	-	0.100	Jan 2014	-		-		-		-	Continuing	Continuing	-
Program Management Support/PMA-3	Various	Various : Hanscom AFB, MA	-	0.251	Jan 2014	-		-		-		-	Continuing	Continuing	-
Subtotal			-	0.599		-		-		-		-	-	-	-

	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	7.418	-	-	-	-	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2016 Air Force		Date: February 2015
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207449F / Command and Control (C2) Constellation	Project (Number/Name) 675078 / Horizontal Integration

	FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Requirements/Capability Based Planning	███																											
Architecture and Systems Engineering	███																											
Horizontal Integration Solutions	███																											

Exhibit R-4A, **RDT&E Schedule Details:** PB 2016 Air Force		**Date:** February 2015
Appropriation/Budget Activity 3600 *I* 7	**R-1 Program Element (Number/Name)** PE 0207449F *I Command and Control (C2) Constellation*	**Project (Number/Name)** 675078 *I Horizontal Integration*

Schedule Details

Events	Start		End	
	Quarter	**Year**	**Quarter**	**Year**
Requirements/Capability Based Planning	1	2014	4	2014
Architecture and Systems Engineering	1	2014	4	2014
Horizontal Integration Solutions	1	2014	4	2014