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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2016 Air Force **Date:** February 2015

<b>Appropriation/Budget Activity</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force I BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0603790F / NATO Research and Development
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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	-	4.561	2.392	4.736	-	4.736	4.407	3.877	3.970	4.059	Continuing	Continuing
64NATO: <i>Nato Coop R&amp;D</i>	-	4.561	2.392	4.736	-	4.736	4.407	3.877	3.970	4.059	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**Note**

In FY 2016, PE 0603791F, International Space Cooperative Research & Development, Project 645035, International Space Coop R&D, efforts were transferred to PE 0603790, NATO Research and Development, Project 64NATO, NATO Coop R&D, in order to consolidate international cooperative research and development activities.

**A. Mission Description and Budget Item Justification**

These funds will be used to initiate air, space, and cyber international cooperative research, and development (ICR&D) agreements with North Atlantic Treaty Organization (NATO) member states, major non-NATO allies and friendly foreign countries. Each of the selected activities and projects are required to have a concluded international agreement (IA), prior to funds being released, that implements the provisions of Title 10 U.S. Code, Section 2350a. This legislation (Title 10 U.S. Code, Section 2350) authorizes funds to significantly improve U.S. and allied conventional defense capabilities by leveraging the best defense technologies, eliminating costly duplication of R&D efforts, accelerating the availability of defense systems, and promoting US and allied interoperability or commonality. These funds will not be used for government civilian salaries, permanent construction, or spent overseas. This program element funds the implementation of Air Force ICR&D agreements in (1) Basic Research (2) Applied Research (3) Advanced Technology Development (4) Advanced Component Development and Prototypes (5) System Development and Demonstration and (6) RDT&E Management Support.

This program is in Budget Activity 4, Advanced Component Development and Prototypes (ACD&P) because efforts are necessary to evaluate integrated technologies, representative modes or prototype systems in a high fidelity and realistic operating environment.

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2014</b>	<b>FY 2015</b>	<b>FY 2016 Base</b>	<b>FY 2016 OCO</b>	<b>FY 2016 Total</b>
Previous President's Budget	4.568	2.392	4.972	-	4.972
Current President's Budget	4.561	2.392	4.736	-	4.736
Total Adjustments	-0.007	-	-0.236	-	-0.236
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.007	-			
• Other Adjustments	-	-	-0.236	-	-0.236

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<p><b>Change Summary Explanation</b>  FY 2016 program funding increase due to the transfer of PE 0603791F International Space &amp; Cooperative R&amp;D to PE 0603790F NATO Research and Development to consolidate activities under one Program Element Code.</p>				
<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2014</b>	<b>FY 2015</b>	<b>FY 2016</b>
<b>Title:</b> International Cooperative Research and Development		4.561	2.392	4.736
<p><b>Description:</b> Supports bi- and multi-lateral international agreements that meet USAF RDT&amp;E objectives and goals. Each of the cooperative projects that receive funding must meet one or more of the following requirements: enhance warfighter capabilities and coalition interoperability; accelerate the availability of defense systems; strengthen and reinforce strategic partnerships; gain access to the best defense technologies, capabilities and techniques; build relationships and influence with allies; and/or eliminate duplication of R&amp;D efforts.</p>				
<p><b>FY 2014 Accomplishments:</b>  FY14 cooperative projects included but were not limited to: First Generation Quad-Stimulus Laser Eye Protection; Hot Spots Structural Health Monitoring; Coalition Live, Virtual and Constructive Training Research; Bio-Inspired Technologies for Unmanned Aerial Systems (UAS); Air Vehicle Integrated Energy and Power Management Modeling and Simulation; Non-Invasive Rapid Detection of Stress Levels via Nano Devices; Solid Rocket Motor Critical Defect Analysis and Health Monitoring; Robust Affordable Network Global Navigation Satellite Systems Receiver for Military Applications; and others.</p>				
<p><b>FY 2015 Plans:</b>  FY15 cooperative projects include, but are not limited to, RDT&amp;E efforts in human performance, directed energy, information systems, aerospace systems, munitions, materials and manufacturing, sensors, and space vehicles. Representative projects include but are not limited to Unmanned Aerial Systems Crew Training Research, Modeling Fatigue from Prolonged Driving, Quantification Standards to Assess the Loss of Thermal Barrier Coating due to Calcium-Magnesia-Alumina-Silicate Exposure, Advanced Rotary Engine Design for Tactical Unmanned Aerial Vehicles, Time Critical Targeting in Urban Environments, Environmental Health and Safety of Advanced Nanomaterials, Panchromatic Materials for Optical Sensor Protection, Resolving High Temperature/Pressure and Unsteady Flow Measurements for Advanced Cycle Diagnostics, Flight Information Exchange Model for Air Force Mission Planning, Tessellated Nanosatellite-enhanced Communications Feasibility, Coalition Performance Evaluation Tracking System, Real-time Coalition Performance Assessment; and others.</p>				
<p><b>FY 2016 Plans:</b>  FY16 cooperative projects will include, but are not limited to, RDT&amp;E efforts in human performance, directed energy, information systems, aerospace systems, munitions, materials and manufacturing, sensors, and space vehicles. Representative projects include but are not limited to Unmanned Aerial Systems Crew Training Research, Modeling Fatigue from Prolonged Driving, Quantification Standards to Assess the Loss of Thermal Barrier Coating due to Calcium-Magnesia-Alumina-Silicate Exposure,</p>				

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<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2014</b>	<b>FY 2015</b>	<b>FY 2016</b>
Advanced Rotary Engine Design for Tactical Unmanned Aerial Vehicles, Time Critical Targeting in Urban Environments, Environmental Health and Safety of Advanced Nanomaterials, Panchromatic Materials for Optical Sensor Protection, Resolving High Temperature/Pressure and Unsteady Flow Measurements for Advanced Cycle Diagnostics, Flight Information Exchange Model for Air Force Mission Planning, Tessellated Nanosatellite-enhanced Communications Feasibility, Coalition Performance Evaluation Tracking System, Real-time Coalition Performance Assessment; and others			
<b>Accomplishments/Planned Programs Subtotals</b>	4.561	2.392	4.736

**D. Other Program Funding Summary (\$ in Millions)**  
N/A

**Remarks**

**E. Acquisition Strategy**

A principal goal of the NATO Cooperative R&D program is to effectively utilize the aggregate resources invested by the US and our allies in air, space, and cyber R&D. This program element provides the critical funding incentive needed to pursue air, space and cyber related International Cooperative Research Development and Acquisition (ICRD&A) agreements and helps to (a) leverage USAF and allied resources through cost sharing and economies of scale; (b) exploit the best US and allied technologies for equipping coalition forces; (c) demonstrate areas of commonality or interoperability with our allies; and (d) accelerate the availability of defense technology and systems. Candidate projects are reviewed against USAF goals, DoD objectives, and warfighter needs prior to being approved. An international agreement defining project objectives, responsibilities and costs is required prior to release of funds. To obtain these funds and ensure service commitment, projects are selected from existing or new RDT&E programs funded in the Future Years Defense Plan (FYDP). Project offices must show matching funds and contributions from associated program elements and equitable allied funding. As appropriate, funding responsibility for out-year requirements and follow-on efforts are transferred to the project office and associated program elements. Any new contracts are awarded after full and open competition.

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

<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603790F / NATO Research and Development	<b>Project (Number/Name)</b> 64NATO / Nato Coop R&D
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<b>Product Development (\$ in Millions)</b>				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
<b>Subtotal</b>			-	-	-	-	-	-	-	-	-	-	-	-	-

<b>Support (\$ in Millions)</b>				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
International Research Projects	Various	Various : ,	-	3.561	Feb 2014	1.500	Feb 2015	3.468	Feb 2016	-		3.468	Continuing	Continuing	-
<b>Subtotal</b>			-	3.561		1.500		3.468		-		3.468	-	-	-

<b>Test and Evaluation (\$ in Millions)</b>				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
International Research Projects	Various	Various : ,	-	1.000	Feb 2014	0.892	Feb 2015	1.268	Feb 2016	-		1.268	Continuing	Continuing	-
<b>Subtotal</b>			-	1.000		0.892		1.268		-		1.268	-	-	-

<b>Management Services (\$ in Millions)</b>				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
<b>Subtotal</b>			-	-		-		-		-		-	-	-	-

			Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>			-	4.561	2.392	4.736	-	4.736	-	-	-

**Remarks**

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<b>Exhibit R-4, RDT&amp;E Schedule Profile: PB 2016 Air Force</b>		<b>Date:</b> February 2015
<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603790F / NATO Research and Development	<b>Project (Number/Name)</b> 64NATO / Nato Coop R&D

	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
FY16 ICR&D Projects - Call Letter		■																										
FY16 ICR&D Projects - nomination package development		■	■																									
FY16 ICR&D Projects - Review panel			■																									
FY16 ICR&D Projects - Coordination of review panel results				■																								
FY16 ICR&D Projects - Approved projects letter sent to MAJCOMs				■																								
FY16 ICR&D Projects - Agreement development, negotiations, and signature						■	■	■																				
FY16 ICR&D Projects - RDTE cooperative project work										■	■	■	■	■	■	■												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2016 Air Force		<b>Date:</b> February 2015
<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603790F / NATO Research and Development	<b>Project (Number/Name)</b> 64NATO / Nato Coop R&D

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
FY16 ICR&D Projects - Call Letter	2	2014	2	2014
FY16 ICR&D Projects - nomination package development	2	2014	3	2014
FY16 ICR&D Projects - Review panel	3	2014	3	2014
FY16 ICR&D Projects - Coordination of review panel results	4	2014	4	2014
FY16 ICR&D Projects - Approved projects letter sent to MAJCOMs	4	2014	4	2014
FY16 ICR&D Projects - Agreement development, negotiations, and signature	1	2015	4	2015
FY16 ICR&D Projects - RDTE cooperative project work	1	2016	4	2017