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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603790F I NATO Research and Development							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	4.174	3.851	2.305	0.000	2.305	4.955	4.701	4.147	4.222	0.000	28.355
64NATO: Nato Coop R&D	-	4.174	3.851	2.305	0.000	2.305	4.955	4.701	4.147	4.222	0.000	28.355
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 0603790F, 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.

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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	4.333	3.851	3.934	0.000	3.934
Current President's Budget	4.174	3.851	2.305	0.000	2.305
Total Adjustments	-0.159	0.000	-1.629	0.000	-1.629
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	-0.159	0.000	-1.629	0.000	-1.629
C. Accomplishments/Planned Programs (\$ in Millions)					
	FY 2017	FY 2018	FY 2019		
Title: International Cooperative Research and Development	4.174	3.851	2.305		
Description: Supports bi- and multi-lateral international agreements that meet USAF RDT&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&D efforts.					
FY 2018 Plans:					
FY18 cooperative projects involve RDT&E efforts in human performance, information systems, aerospace systems, munitions, materials and manufacturing, sensors, space situational awareness, missile warning, military satellite communications, global positioning systems, responsive space capabilities, cyber network defense and information assurance, and space vehicles. These projects include but are not limited to: Monitoring for Advanced Geolocation Processing And Interference Exploitation (MAGPIE); Next Generation Case Technology; Machine Translation for Coalition Forces; Low Pressure Turbine (LPT) Performance Improvement;Performance in Extreme Loading and Impact Conditions for Affordable Next-generation Steels; Enabling Novel Human Assessment and Neurophysiological Characterization of Effectiveness (ENHANCE); Graphene on 3C-SiC on Si for low-loss nanophotonics; SATNAV Augmentation to Improve Navigation Technology (SAINT); Warfighter Benefits of UK Prototype Laser Eye Protection (LEP) Devices; Ceramic Matrix Composites (CMCs) for Hypersonic Hot Structures; Minimal Invasive Repair of Composite Structures; Computational Multi-Scale Modeling of Explosives; Space Environment Impacts; Medium Earth Orbit (MEO) Hosted Energetic Charged Particle (ECP) Constellation; and Mission Execution Tracking and Re-Planning Assistant.					
FY 2019 Plans:					

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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>		R-1 Program Element (Number/Name) PE 0603790F / NATO Research and Development		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
<p>FY19 cooperative projects involve RDT&E efforts in human performance, information systems, aerospace systems, munitions, materials and manufacturing, sensors, space situational awareness, missile warning, military satellite communications, global positioning systems, responsive space capabilities, cyber network defense and information assurance, and space vehicles. These projects include but are not limited to; two Classified Projects in Cyber; Physiological Assessment for Warfighter Performance Prediction; Sensors & PID Enhanced by Directed Energy; Real-time Decentralized Task Allocation for Heterogeneous Swarming UAV; Weapon Effects with respect to Military Operations in Urban Terrain; Coated CMCs for Hypersonics; Materials for Long Pulse Laser Protection; Counter Agile Radar Application; Collaborative Space Domain Awareness (SDA) Data Collection and Fusion; Airborne Data Exchange; Cooperative Research on Anti-swarm Fuze-sensor Technology; Adaptive Automation to Support Team Decision Making in Complex Environments; Solid Propellant Rotating Detonation Engine Demonstrator; Autonomous Fighter Risk Reduction Program; Infusion Processing and Fatigue; Analyses of Polymer Matrix Composites considering Environmental Effects; Cognitive Biomarker Sensor Development; Advanced Fuel-Spray Diagnostics for Propulsion Systems; Improved Durable Engines for UAVs; Bio-Inspired Technologies for Unmanned Autonomous Systems; Improved Elements for Next Gen RF-Directed Energy Weapons, Lasers and Detectors for UAS Systems; Measures for Evaluation of Air Vehicle Systems; RF Directed Energy Weapon Target Surrogates; Time Critical Targeting in Urban Environments; WarHead Improvements using Technology for Enhanced Functionality and Increased Survivability against Hard Targets; Protected Tactical Field Demonstration; and Protected Tactical Enterprise Service.</p> <p><i>FY 2018 to FY 2019 Increase/Decrease Statement:</i></p> <p>The NATO Coop R&D Program experienced a sixty percent increase in project applications for funding. The increase in project applications coupled with budget constraints limited the number of selected projects, no project received the full funding they requested allowing additional projects to be selected. Some projects with vital non-traditional strategic partners were not selected because of the limited budget. The NATO Coop R&D Program's projected budget is insufficient to sustain the programs' continued popularity, thereby inhibiting growth into key strategic areas.</p>				
Accomplishments/Planned Programs Subtotals		4.174	3.851	2.305
D. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
E. Acquisition Strategy				
<p>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</p>				

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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 2019 Air Force													Date: February 2018		
Appropriation/Budget Activity 3600 / 4					R-1 Program Element (Number/Name) PE 0603790F / NATO Research and Development					Project (Number/Name) 64NATO / Nato Coop R&D					
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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
NATO Coop R&D (International Research Projects)	Various	Various : NV	-	3.023	Feb 2017	2.815	Feb 2018	1.125	Feb 2019	-		1.125	Continuing	Continuing	-
Subtotal			-	3.023		2.815		1.125		-		1.125	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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
NATO Coop R&D (International Research Projects)	Various	Various : NV	-	1.151	Feb 2017	1.036	Feb 2018	1.180		-		1.180	Continuing	Continuing	-
Subtotal			-	1.151		1.036		1.180		-		1.180	Continuing	Continuing	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	4.174		3.851		2.305		-		2.305	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force			Date: February 2018		
Appropriation/Budget Activity 3600 / 4		R-1 Program Element (Number/Name) PE 0603790F / NATO Research and Development			Project (Number/Name) 64NATO / Nato Coop R&D

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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
NATO Coop R&D																												
FY19 ICR&D Projects - Call Letter																												
FY19 ICR&D Projects - nomination package development																												
FY19 ICR&D Projects - Review panel																												
FY19 ICR&D Projects - Coordination of review panel results																												
FY19 ICR&D Approved Project Letter to the MAJCOMs																												
FY19 ICR&D Projects - Agreement development, negotiations, and signature																												
FY19 ICR&D Projects - RDTE cooperative project work																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force			Date: February 2018
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603790F / NATO Research and Development	Project (Number/Name) 64NATO / Nato Coop R&D	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>NATO Coop R&D</i>				
FY19 ICR&D Projects - Call Letter	2	2017	2	2017
FY19 ICR&D Projects - nomination package development	2	2017	3	2017
FY19 ICR&D Projects - Review panel	3	2017	3	2017
FY19 ICR&D Projects - Coordination of review panel results	4	2017	4	2017
FY19 ICR&D Approved Project Letter to the MAJCOMs	4	2017	4	2017
FY19 ICR&D Projects - Agreement development, negotiations, and signature	1	2017	4	2018
FY19 ICR&D Projects - RDTE cooperative project work	1	2018	4	2018