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<b>Exhibit R-2, RDT&amp;E Budget Item Justification: PB 2012 Air Force</b>	<b>DATE:</b> February 2011
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APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMENCLATURE							
3600: <i>Research, Development, Test &amp; Evaluation, Air Force</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>				PE 0603790F: <i>NATO Cooperative R&amp;D</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	4.243	4.372	4.424	-	4.424	4.499	4.568	4.633	4.715	Continuing	Continuing
64NATO: <i>Nato Coop R&amp;D</i>	4.243	4.372	4.424	-	4.424	4.499	4.568	4.633	4.715	Continuing	Continuing

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

These funds will be used to help implement international cooperative research, development, and acquisition (ICRD&A) agreements with North Atlantic Treaty Organization (NATO) member states, major non-NATO allies and friendly foreign countries. The program implements the provisions of Title 10 U.S. Code, Section 2350a on NATO Cooperative Research and Development (R&D). The program was established to improve cooperation among NATO nations, and later major non-NATO allies, in research, development, and acquisition. The legislation authorized funds to significantly improve United States (US) 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. The program will be reported as required by Title 10 U.S. Code, Section 2350a(f). This program element funds the implementation of Air Force ICRD&A 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 PE is designated in Budget Activity 4 because most of the ICRD&A projects support specific systems, include all efforts necessary to evaluate integrated technologies in as realistic an operating environment as possible to assess the performance or cost reduction potential of advanced technology, and help expedite technology transition from the laboratory to operational use.

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2010</b>	<b>FY 2011</b>	<b>FY 2012 Base</b>	<b>FY 2012 OCO</b>	<b>FY 2012 Total</b>
Previous President's Budget	4.351	4.372	4.439	-	4.439
Current President's Budget	4.243	4.372	4.424	-	4.424
Total Adjustments	-0.108	-	-0.015	-	-0.015
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Other Adjustments	-0.108	-	-0.015	-	-0.015

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Exhibit R-2A, RDT&E Project Justification: PB 2012 Air Force								DATE: February 2011				
APPROPRIATION/BUDGET ACTIVITY 3600: Research, Development, Test & Evaluation, Air Force BA 4: Advanced Component Development & Prototypes (ACD&P)				R-1 ITEM NOMENCLATURE PE 0603790F: NATO Cooperative R&D				PROJECT 64NATO: Nato Coop R&D				
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	
64NATO: Nato Coop R&D	4.243	4.372	4.424	-	4.424	4.499	4.568	4.633	4.715	Continuing	Continuing	
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0			
A. Mission Description and Budget Item Justification												
These funds will be used to help implement international cooperative research, development, and acquisition (ICRD&A) agreements with North Atlantic Treaty Organization (NATO) member states, major non-NATO allies and friendly foreign countries. The program implements the provisions of Title 10 U.S. Code, Section 2350a on NATO Cooperative Research and Development (R&D). The program was established to improve cooperation among NATO nations, and later major non-NATO allies, in research, development, and acquisition. The legislation authorized funds to significantly improve United States (US) 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. The program will be reported as required by Title 10 U.S. Code, Section 2350a(f). This program element funds the implementation of Air Force ICRD&A 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 PE is designated in Budget Activity 4 because most of the ICRD&A projects support specific systems, include all efforts necessary to evaluate integrated technologies in as realistic an operating environment as possible to assess the performance or cost reduction potential of advanced technology, and help expedite technology transition from the laboratory to operational use.												
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
<b>Title:</b> Development of Animal Models to Assess the Inhalation Exposure of Engineered Nanomaterials (AFRL and Australia)  <b>Description:</b> Development of Animal Models to Assess the Inhalation Exposure of Engineered Nanomaterials (AFRL and Australia).  <b>FY 2010 Accomplishments:</b> Continue cooperative project to research in vivo animal research in Australia with in vitro nanotoxicology research at AFRL to address the critical lack of existing knowledge concerning potential adverse biologic/toxic effects of nanomaterials.  <b>FY 2011 Plans:</b>  <b>FY 2012 Base Plans:</b>  <b>FY 2012 OCO Plans:</b>								0.100	-	-	-	-
								<b>Title:</b> Modulation of Immune Response by Inhaled Engineered Nanoparticles (AFRL and Sweden)				
								0.100	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2012 Air Force				DATE: February 2011	
APPROPRIATION/BUDGET ACTIVITY 3600: Research, Development, Test & Evaluation, Air Force BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 ITEM NOMENCLATURE PE 0603790F: NATO Cooperative R&D		PROJECT 64NATO: Nato Coop R&D	
B. Accomplishments/Planned Programs (\$ in Millions)					
	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
<b>Description:</b> Modulation of Immune Response by Inhaled Engineered Nanoparticles (AFRL and Sweden).  <b>FY 2010 Accomplishments:</b> Continue cooperative project to research in vivo animal research in Sweden with in vitro nanotoxicology research at AFRL addressing the critical lack of existing knowledge concerning potential adverse biologic/toxic effects of nanomaterials.  <b>FY 2011 Plans:</b>  <b>FY 2012 Base Plans:</b>  <b>FY 2012 OCO Plans:</b>					
<b>Title:</b> Image Gyro (AFRL and Japan)  <b>Description:</b> Image Gyro (AFRL and Japan). Cooperative project to develop a new image-based motion sensor known as the "Image Gyro".  <b>FY 2010 Accomplishments:</b> Continue the Image Gyro will be a low-cost, lightweight and highly accurate device that will achieve equivalent or higher precision drift free capabilities than that of today's accurate and more expensive inertial navigation systems. In addition to GPS free precision navigation, the Image Gyro will provide capabilities such as: passive moving target indication (MTI), 3D scene reconstruction (3D structure from motion), obstacle/collision avoidance, and automatic target recognition.  <b>FY 2011 Plans:</b> Continue the Image Gyro will be a low-cost, lightweight and highly accurate device that will achieve equivalent or higher precision drift free capabilities than that of today's accurate and more expensive inertial navigation systems. In addition to GPS free precision navigation, the Image Gyro will provide capabilities such as: passive moving target indication (MTI), 3D scene reconstruction (3D structure from motion), obstacle/collision avoidance, and automatic target recognition.  <b>FY 2012 Base Plans:</b>  <b>FY 2012 OCO Plans:</b>					
<b>Title:</b> Durability Assessment and Probabilistic Life Prediction of Titanium Alloys (AFRL and India)					

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Exhibit R-2A, RDT&E Project Justification: PB 2012 Air Force				DATE: February 2011		
APPROPRIATION/BUDGET ACTIVITY 3600: Research, Development, Test & Evaluation, Air Force BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 ITEM NOMENCLATURE PE 0603790F: NATO Cooperative R&D		PROJECT 64NATO: Nato Coop R&D		
B. Accomplishments/Planned Programs (\$ in Millions)						
		FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
<b>Description:</b> Durability Assessment and Probabilistic Life Prediction of Titanium Alloys (AFRL and India).						
<b>FY 2010 Accomplishments:</b> Continue cooperative project to research technical areas as related to titanium alloys: (1) Fundamental information on the microstructure of titanium alloys as affected by the conditions of their fabrication and their composition to include simulation and modeling to allow prediction of their properties. (2) Methods for life prediction of titanium alloys in service as a function of exposure conditions and fatigue, fracture and damage models in order to fully utilize those alloys for aeronautical structures and components.						
<b>FY 2011 Plans:</b> Continue cooperative project to research technical areas as related to titanium alloys: (1) Fundamental information on the microstructure of titanium alloys as affected by the conditions of their fabrication and their composition to include simulation and modeling to allow prediction of their properties. (2) Methods for life prediction of titanium alloys in service as a function of exposure conditions and fatigue, fracture and damage models in order to fully utilize those alloys for aeronautical structures and components.						
<b>FY 2012 Base Plans:</b>						
<b>FY 2012 OCO Plans:</b>						
<b>Title:</b> Aging Systems Materials and Process Technologies (AFRL and Australia)		0.100	0.050	-	-	-
<b>Description:</b> Aging Systems Materials and Process Technologies (AFRL and Australia).						
<b>FY 2010 Accomplishments:</b> Continue cooperative project to develop and/or optimize techniques aimed at improving aircraft structural and electrical integrity. When implemented, these techniques will reduce life-cycle costs associated with legacy, emerging, and future aircraft as well as improve aircraft availability and safety. Project focus will be on bonded joints and aircraft wiring.						
<b>FY 2011 Plans:</b> Continue cooperative project to develop and/or optimize techniques aimed at improving aircraft structural and electrical integrity. When implemented, these techniques will reduce life-cycle costs associated with legacy,						

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Exhibit R-2A, RDT&E Project Justification: PB 2012 Air Force			DATE: February 2011			
APPROPRIATION/BUDGET ACTIVITY 3600: Research, Development, Test & Evaluation, Air Force BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 ITEM NOMENCLATURE PE 0603790F: NATO Cooperative R&D	PROJECT 64NATO: Nato Coop R&D				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
emerging, and future aircraft as well as improve aircraft availability and safety. Project focus will be on bonded joints and aircraft wiring. <b>FY 2012 Base Plans:</b> <b>FY 2012 OCO Plans:</b>						
<b>Title:</b> Military Aircraft Survivability Through Improved Composite Structures (USAF 46th Test Wing and Germany) <b>Description:</b> Military Aircraft Survivability Through Improved Composite Structures (USAF 46th Test Wing and Germany). <b>FY 2010 Accomplishments:</b> Continue cooperative project will assess: the degradation of composite mechanical properties caused by brief fuel fires (e.g., aircraft dry-bay fires sustained during combat that are extinguished within seconds of initiation) and the damage resistance of aircraft skin-spar joints when subjected to high strain rate loading conditions. <b>FY 2011 Plans:</b> <b>FY 2012 Base Plans:</b> <b>FY 2012 OCO Plans:</b>		0.376	-	-	-	-
<b>Title:</b> Flapping Wing Micro Air Vehicle Collaborative Development (AFRL and Korea) <b>Description:</b> Flapping Wing Micro Air Vehicle Collaborative Development (AFRL and Korea). <b>FY 2010 Accomplishments:</b> Cooperative project to design, develop and test a prototype micro air vehicle. <b>FY 2011 Plans:</b> Continue cooperative project to design, develop and test a prototype micro air vehicle. <b>FY 2012 Base Plans:</b> <b>FY 2012 OCO Plans:</b>		0.300	0.100	-	-	-
<b>Title:</b> Ultrahigh Temperature Ceramics (AFRL and UK)		0.300	0.250	-	-	-

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APPROPRIATION/BUDGET ACTIVITY 3600: Research, Development, Test & Evaluation, Air Force BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 ITEM NOMENCLATURE PE 0603790F: NATO Cooperative R&D	PROJECT 64NATO: Nato Coop R&D				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
<b>Description:</b> Ultrahigh Temperature Ceramics (AFRL and UK).  <b>FY 2010 Accomplishments:</b> Cooperative project to accelerate understanding and development of ultrahigh temperature ceramic materials for system transition.  <b>FY 2011 Plans:</b> Continue cooperative project to accelerate understanding and development of ultrahigh temperature ceramic materials for system transition.  <b>FY 2012 Base Plans:</b>  <b>FY 2012 OCO Plans:</b>						
<b>Title:</b> Compact Penetrating Weapons for the Defeat of Hardened Targets (AFRL - UK)  <b>Description:</b> Compact Penetrating Weapons for the Defeat of Hardened Targets (AFRL - UK).  <b>FY 2010 Accomplishments:</b> Cooperative project to improve maximum penetration and lethal effectiveness capability in weapons for use with advanced fighter aircraft and other aircraft.  <b>FY 2011 Plans:</b> Cooperative project to improve maximum penetration and lethal effectiveness capability in weapons for use with advanced fighter aircraft and other aircraft.  <b>FY 2012 Base Plans:</b>  <b>FY 2012 OCO Plans:</b>		0.300	0.400	-	-	-
<b>Title:</b> Dynamic Network Visualization Techniques for Cyberspace (AFRL - Singapore)  <b>Description:</b> Dynamic Network Visualization Techniques for Cyberspace (AFRL - Singapore).  <b>FY 2010 Accomplishments:</b> Cooperative project to develop visualization and interaction techniques for showing dynamic network information for cyberspace operations.  <b>FY 2011 Plans:</b>		0.300	0.400	-	-	-

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Cooperative project to develop visualization and interaction techniques for showing dynamic network information for cyberspace operations. <b>FY 2012 Base Plans:</b> <b>FY 2012 OCO Plans:</b>						
<b>Title:</b> Assessment of Military Operations in Urban Terrain (AFRL - Germany) <b>Description:</b> Assessment of Military Operations in Urban Terrain (AFRL - Germany). <b>FY 2010 Accomplishments:</b> Cooperative project to investigate the lethality of an array of munitions against military operations against urban terrain targets. <b>FY 2011 Plans:</b> Cooperative project to investigate the lethality of an array of munitions against military operations against urban terrain targets. <b>FY 2012 Base Plans:</b> <b>FY 2012 OCO Plans:</b>		0.300	0.300	-	-	-
<b>Title:</b> Thermal Barrier Coating Health and Turbine Temperature Sensing (AFRL and UK). <b>Description:</b> Thermal Barrier Coating Health and Turbine Temperature Sensing (AFRL and UK). <b>FY 2010 Accomplishments:</b> Cooperative project to test thermal barrier coating in suitable environments where common nomenclature, test specification, data format, standardization, and interoperability can be established. <b>FY 2011 Plans:</b> Cooperative project to test thermal barrier coating in suitable environments where common nomenclature, test specification, data format, standardization, and interoperability can be established. <b>FY 2012 Base Plans:</b> <b>FY 2012 OCO Plans:</b>		0.300	0.350	-	-	-
<b>Title:</b> Efficacy of Vibrotactile Stimulation in Simulated Operational Conditions (AFRL and The Netherlands)		0.300	-	-	-	-

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B. Accomplishments/Planned Programs (\$ in Millions)						
		FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
<b>Description:</b> Efficacy of Vibrotactile Stimulation in Simulated Operational Conditions (AFRL and The Netherlands).  <b>FY 2010 Accomplishments:</b> Cooperative project to validate the efficacy of a vibrotactile landing aid for helicopter pilots under simulated operational conditions, i.e. after prolonged time-on-task and wearing full garment in a warm environment.  <b>FY 2011 Plans:</b>  <b>FY 2012 Base Plans:</b>  <b>FY 2012 OCO Plans:</b>						
<b>Title:</b> Next Generation Advanced Composite Processing Science (AFRL and Canada) <b>Description:</b> Next Generation Advanced Composite Processing Science (AFRL and Canada).  <b>FY 2010 Accomplishments:</b> Cooperative project to develop and validate the next generation process models to aid in the manufacturing of advanced polymer matrix composite and hybrid materials in an effort to maximize their affordable and efficient use for aerospace applications.  <b>FY 2011 Plans:</b> Cooperative project to develop and validate the next generation process models to aid in the manufacturing of advanced polymer matrix composite and hybrid materials in an effort to maximize their affordable and efficient use for aerospace applications.  <b>FY 2012 Base Plans:</b>  <b>FY 2012 OCO Plans:</b>		0.300	0.050	-	-	-
<b>Title:</b> Command and Control Interoperability Program (AFRL and UK) <b>Description:</b> Command and Control Interoperability Program (AFRL and UK).  <b>FY 2010 Accomplishments:</b>		0.617	0.300	-	-	-

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Cooperative project to develop, experiment, demonstrate and provide a report into a capability to effectively, efficiently and seamlessly exchange space planning, replanning and information products between and amongst coalition warfighters. <b>FY 2011 Plans:</b> Cooperative project to develop, experiment, demonstrate and provide a report into a capability to effectively, efficiently and seamlessly exchange space planning, replanning and information products between and amongst coalition warfighters. <b>FY 2012 Base Plans:</b> <b>FY 2012 OCO Plans:</b>						
<b>Title:</b> Machine Translation for International Security Assistance Force (711 HPW/RHX). <b>Description:</b> Machine Translation for International Security Assistance Force (711 HPW/RHX).  <b>FY 2010 Accomplishments:</b> <b>FY 2011 Plans:</b> Cooperative project to build prototype machine translation system for English and German to Dari to support coalition operations in Afghanistan.  <b>FY 2012 Base Plans:</b> Continuation of cooperative project to build prototype machine translation system for English and German to Dari to support coalition operations in Afghanistan.  <b>FY 2012 OCO Plans:</b>		-	0.100	0.100	-	0.100
<b>Title:</b> Live, Virtual and Constructive Immersive Decision Making Environments (711 HPW/RHA and Canada) <b>Description:</b> Live, Virtual and Constructive Immersive Decision Making Environments (711 HPW/RHA and Canada).  <b>FY 2010 Accomplishments:</b> <b>FY 2011 Plans:</b>		-	0.300	0.300	-	0.300

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APPROPRIATION/BUDGET ACTIVITY 3600: Research, Development, Test & Evaluation, Air Force BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 ITEM NOMENCLATURE PE 0603790F: NATO Cooperative R&D	PROJECT 64NATO: Nato Coop R&D				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Cooperative project to significantly improve cost and effectiveness of LVC technology, focusing on UAV, Homeland Defense and Electronic Warfare training, rehearsal and advanced threat modeling. <b>FY 2012 Base Plans:</b> Continuation of cooperative project to significantly improve cost and effectiveness of LVC technology, focusing on UAV, Homeland Defense and Electronic Warfare training, rehearsal and advanced threat modeling. <b>FY 2012 OCO Plans:</b>						
<b>Title:</b> Robust Solid State Materials for Optical Sensors Protection (AFRL and Sweden) <b>Description:</b> Robust Solid State Materials for Optical Sensors Protection (AFRL and Sweden). <b>FY 2010 Accomplishments:</b> <b>FY 2011 Plans:</b> Cooperative project will develop solid state glassy solids for sensor protection against threat pulsed laser radiation. Will measure limiting performance by a battery of characterization techniques and deliver a series of solids to be placed in optical system platforms. <b>FY 2012 Base Plans:</b> Continuation of cooperative project will develop solid state glassy solids for sensor protection against threat pulsed laser radiation. Will measure limiting performance by a battery of characterization techniques and deliver a series of solids to be placed in optical system platforms. <b>FY 2012 OCO Plans:</b>		-	0.200	0.200	-	0.200
<b>Title:</b> Common Coalition Airborne Access Portal (551 ELSW and NATO). <b>Description:</b> Common Coalition Airborne Access Portal (551 ELSW and NATO). <b>FY 2010 Accomplishments:</b> <b>FY 2011 Plans:</b> Cooperative project will connect US/European lab sites and airborne IP networks via a common access portal that provides interoperability and mulitnational security. <b>FY 2012 Base Plans:</b>		-	0.295	0.400	-	0.400

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Continuation of cooperative project will connect US/European lab sites and airborne IP networks via a common access portal that provides interoperability and mulitnational security. <b>FY 2012 OCO Plans:</b>						
<b>Title:</b> Radio Frequency (RF) Modeling and Simulation Experimentation for Distributed Electronic Warfare, Situational Awareness and Response (DEWSAR) Project (AFRL/RY and Australia) <b>Description:</b> Radio Frequency (RF) Modeling and Simulation Experimentation for Distributed Electronic Warfare, Situational Awareness and Response (DEWSAR) Project (AFRL/RY and Australia). <b>FY 2010 Accomplishments:</b> <b>FY 2011 Plans:</b> Cooperative project will evaluate distributed electronic support and electronic attack architectures. <b>FY 2012 Base Plans:</b> Continuation of cooperative project will evaluate distributed electronic support and electronic attack architectures. <b>FY 2012 OCO Plans:</b>		-	0.294	0.400	-	0.400
<b>Title:</b> Advanced Ladar Imaging Analysis System (AFRL and France) <b>Description:</b> Advanced Ladar Imaging Analysis System (AFRL and France). <b>FY 2010 Accomplishments:</b> <b>FY 2011 Plans:</b> Cooperative project will develop techniques for enhanced imaging for combat identification. The effort will focus on the development, test and evaluation of algorithms for 3-D laser, advanced ladar modes and coherent aperture synthesis. <b>FY 2012 Base Plans:</b> Continuation of cooperative project will develop techniques for enhanced imaging for combat identification. The effort will focus on the development, test and evaluation of algorithms for 3-D laser, advanced ladar modes and coherent aperture synthesis. <b>FY 2012 OCO Plans:</b>		-	0.150	0.150	-	0.150

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B. Accomplishments/Planned Programs (\$ in Millions)				FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
<b>Title:</b> Molecular Basis of Stress Responses Using In Vitro Neuronal Models (AFRL and India) <b>Description:</b> Molecular Basis of Stress Responses Using In Vitro Neuronal Models (AFRL and India). <b>FY 2010 Accomplishments:</b> <b>FY 2011 Plans:</b> Cooperative project will enhance warfighter performance optimization through the controlling and monitoring of molecular analytes corresponding to cognitive function and its stressors. <b>FY 2012 Base Plans:</b> Continuation of cooperative project will enhance warfighter performance optimization through the controlling and monitoring of molecular analytes corresponding to cognitive function and its stressors. <b>FY 2012 OCO Plans:</b>				-	0.050	0.050	-	0.050
<b>Title:</b> Synthesis, Formulation and Characterization of Structural Nano-Energetics (AFRL and Singapore) <b>Description:</b> Synthesis, Formulation and Characterization of Structural Nano-Energetics (AFRL and Singapore). <b>FY 2010 Accomplishments:</b> <b>FY 2011 Plans:</b> Cooperative project will develop structural nano-energetic material to transition for replacement of current structural components on micro-munitions and UAVs and enhanced blast effects. <b>FY 2012 Base Plans:</b> Continuation of cooperative project will develop structural nano-energetic material to transition for replacement of current structural components on micro-munitions and UAVs and enhanced blast effects. <b>FY 2012 OCO Plans:</b>				-	0.300	0.400	-	0.400
<b>Title:</b> Monitoring and Controlling Multiple Assets Within Complex Environments (AFRL, Australia and UK) <b>Description:</b> Cooperative project to design, develop, and evaluate new methods of visualizing the operational environment and controlling sensor inputs leveraging automation where best applicable. <b>FY 2010 Accomplishments:</b> <b>FY 2011 Plans:</b>				-	-	0.200	-	0.200

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
FY 2012 Base Plans: Cooperative project to design, develop, and evaluate new methods of visualizing the operational environment and controlling sensor inputs leveraging automation where best applicable.						
FY 2012 OCO Plans: Title: Closed Loop Alternative Navigation Demonstration (AFRL and Australia) Description: Cooperative project to develop an integrated estimation and control vision based navigation system and integrate the closed-loop vision-based navigation system into an unmanned aerial vehicle (UAV).		-	-	0.200	-	0.200
FY 2010 Accomplishments: FY 2011 Plans: FY 2012 Base Plans: Cooperative project to develop an integrated estimation and control vision based navigation system and integrate the closed-loop vision-based navigation system into an unmanned aerial vehicle (UAV).						
FY 2012 OCO Plans: Title: Joint and Coalition Training, Rehearsal, and Exercise Research (AFRL and Australia, Canada, New Zealand, and UK) Description: Cooperative project to enhance technologies, processes, and strategies for routing, persistent, and seamless Live, Virtual, and Constructive (LVC) simulations, and distributed, collaborative methods for joint and coalition training		-	-	0.250	-	0.250
FY 2010 Accomplishments: FY 2011 Plans: FY 2012 Base Plans: Cooperative project to enhance technologies, processes, and strategies for routing, persistent, and seamless Live, Virtual, and Constructive (LVC) simulations, and distributed, collaborative methods for joint and coalition training						
FY 2012 OCO Plans: Title: Life Prediction for Metallic Aircraft Structure (AFRL and France)		-	-	0.300	-	0.300

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B. Accomplishments/Planned Programs (\$ in Millions)						
		FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
<p><b>Description:</b> Cooperative project to develop and demonstrate state-of-the-art life prediction approaches suitable for use in aging aircraft applications allowing for more effective system sustainment leading to improved asset availability, reduced maintenance and manpower requirements, and the elimination of technical surprise driven by unanticipated structural deficiencies.</p> <p><b>FY 2010 Accomplishments:</b></p> <p><b>FY 2011 Plans:</b></p> <p><b>FY 2012 Base Plans:</b> Cooperative project to develop and demonstrate state-of-the-art life prediction approaches suitable for use in aging aircraft applications allowing for more effective system sustainment leading to improved asset availability, reduced maintenance and manpower requirements, and the elimination of technical surprise driven by unanticipated structural deficiencies.</p> <p><b>FY 2012 OCO Plans:</b></p>						
<p><b>Title:</b> Aero Advisory and NOTAMS tools (AMC and Canada)</p> <p><b>Description:</b> Cooperative project to provide the ability to visualize airspace advisories in tabular or graphic format relevant to route of flight for mission planning purposes.</p> <p><b>FY 2010 Accomplishments:</b></p> <p><b>FY 2011 Plans:</b></p> <p><b>FY 2012 Base Plans:</b> Cooperative project to provide the ability to visualize airspace advisories in tabular or graphic format relevant to route of flight for mission planning purposes.</p> <p><b>FY 2012 OCO Plans:</b></p>		-	-	0.250	-	0.250
<p><b>Title:</b> Cultural Radar for Human Terrain Effects (AFRL and Canada)</p> <p><b>Description:</b> Cooperative project to develop mathematical/computational models of information diffusion to characterize how information flows through a population with various types of connectivity, communication patterns, and population characteristics.</p>		-	-	0.100	-	0.100

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Exhibit R-2A, RDT&E Project Justification: PB 2012 Air Force			DATE: February 2011		
APPROPRIATION/BUDGET ACTIVITY 3600: Research, Development, Test & Evaluation, Air Force BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 ITEM NOMENCLATURE PE 0603790F: NATO Cooperative R&D		PROJECT 64NATO: Nato Coop R&D	
B. Accomplishments/Planned Programs (\$ in Millions)					
	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
<b>FY 2010 Accomplishments:</b> <b>FY 2011 Plans:</b> <b>FY 2012 Base Plans:</b> Cooperative project to develop mathematical/computational models of information diffusion to characterize how information flows through a population with various types of connectivity, communication patterns, and population characteristics. <b>FY 2012 OCO Plans:</b>					
<b>Title:</b> Computational Multi-Scale Modeling of Explosives (AFRL and Germany) <b>Description:</b> Cooperative project to develop techniques to incorporate grain level damage mechanisms into modeling the thermo-mechanical behavior of explosive composites. <b>FY 2010 Accomplishments:</b> <b>FY 2011 Plans:</b> <b>FY 2012 Base Plans:</b> Cooperative project to develop techniques to incorporate grain level damage mechanisms into modeling the thermo-mechanical behavior of explosive composites. <b>FY 2012 OCO Plans:</b>					
<b>Title:</b> High Speed Penetrator Cases (AFRL and Germany) <b>Description:</b> Cooperative project to investigate High Speed Penetrators to determine the best means to defeat Hard and Deeply Buried Targets (HDBTs), develop and/or validate modeling and simulation tools for the analysis of weapons concepts and issues appropriate for HDBTs, and conduct research to address new warhead technologies to yield performance enhancements to warheads for penetration and survivability. <b>FY 2010 Accomplishments:</b> <b>FY 2011 Plans:</b> <b>FY 2012 Base Plans:</b>					

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2012 Air Force							<b>DATE:</b> February 2011				
<b>APPROPRIATION/BUDGET ACTIVITY</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>			<b>R-1 ITEM NOMENCLATURE</b> PE 0603790F: <i>NATO Cooperative R&amp;D</i>			<b>PROJECT</b> 64NATO: <i>Nato Coop R&amp;D</i>					
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>											
						<b>FY 2010</b>	<b>FY 2011</b>	<b>FY 2012 Base</b>	<b>FY 2012 OCO</b>	<b>FY 2012 Total</b>	
Cooperative project to investigate High Speed Penetrators to determine the best means to defeat Hard and Deeply Buried Targets (HDBTs), develop and/or validate modeling and simulation tools for the analysis of weapons concepts and issues appropriate for HDBTs, and conduct research to address new warhead technologies to yield performance enhancements to warheads for penetration and survivability.  <b>FY 2012 OCO Plans:</b>											
<b>Title:</b> Team Based Metric Development in Distributed Net-Centric Operations (AFRL and UK) <b>Description:</b> Cooperative project to develop conceptual software applications which would allow the monitoring, management, and mitigation of distributed team workload and situational awareness.  <b>FY 2010 Accomplishments:</b> <b>FY 2011 Plans:</b> <b>FY 2012 Base Plans:</b> Cooperative project to develop conceptual software applications which would allow the monitoring, management, and mitigation of distributed team workload and situational awareness. <b>FY 2012 OCO Plans:</b>						-	-	0.299	-	0.299	
<b>Accomplishments/Planned Programs Subtotals</b>						4.243	4.372	4.424	-	4.424	
<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<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>Not Applicable.</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
<b>D. Acquisition Strategy</b>											
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 conventional defense R&D. This program element provides the critical funding incentive needed to pursue 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 and approved by the USD(AT&L). 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											

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Exhibit R-2A, RDT&E Project Justification: PB 2012 Air Force		DATE: February 2011
<b>APPROPRIATION/BUDGET ACTIVITY</b> 3600: Research, Development, Test & Evaluation, Air Force BA 4: Advanced Component Development & Prototypes (ACD&P)	<b>R-1 ITEM NOMENCLATURE</b> PE 0603790F: NATO Cooperative R&D	<b>PROJECT</b> 64NATO: Nato Coop R&D

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.

## 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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Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Air Force											DATE: February 2011			
APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMENCLATURE				PROJECT						
3600: Research, Development, Test & Evaluation, Air Force				PE 0603790F: NATO Cooperative R&D				64NATO: Nato Coop R&D						
BA 4: Advanced Component Development & Prototypes (ACD&P)														
Product Development (\$ in Millions)				FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Subtotal			-	-		-		-		-	0.000	0.000	0.000	
Support (\$ in Millions)				FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
AFRL/RV	Various	AFRL/RV:Hanscom AFB, MA	0.100	-		-		-		-	0.000	0.100	0.000	
AFRL/RW	Various	AFRL/RW:Eglin AFB, FL	0.400	0.800	Dec 2010	0.900	Feb 2011	-		0.900	0.000	2.100	0.000	
ESC - Hanscom	Various	ESC:Hanscom AFB, MA	0.400	0.600	Dec 2010	0.450	Feb 2011	-		0.450	0.000	1.450	0.000	
AFRL/RZ	Various	AFRL/RZ:Edwards AFB, CA	0.400	-		0.108	Feb 2011	-		0.108	0.000	0.508	0.000	
46 TW	Various	46TW:Eglin AFB, FL	0.300	0.100	Dec 2010	0.150	Feb 2011	-		0.150	0.000	0.550	0.000	
AFRL/RX	Various	AFRL/RX:Tyndall AFB, FL	0.400	0.300	Dec 2010	0.325	Feb 2011	-		0.325	0.000	1.025	0.000	
AFRL/RH	Various	AFRL/RH:Mesa, AZ	0.400	-		0.720	Feb 2011	-		0.720	0.000	1.120	0.000	
AFRL/RY	Various	AFRL/RY:Rome, NY	0.400	0.100	Dec 2010	-		-		-	0.000	0.500	0.000	
AFRL/ML	Various	AFRL/ML:WPAFB, OH	0.892	1.989	Dec 2010	1.045	Feb 2010	-		1.045	0.000	3.926	0.000	
AMC/AQ5	Various	AMC/A5:Scott AFB, IL	-	-		0.300	Feb 2011	-		0.300	0.000	0.300	0.000	
Subtotal			3.692	3.889		3.998		-		3.998	0.000	11.579	0.000	
Test and Evaluation (\$ in Millions)				FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Air Armaments Center	Various	AAC:Eglin AFB, FL	0.400	0.483	Dec 2010	0.426	Feb 2011	-		0.426	0.000	1.309	0.000	
Arnold Engineering Development Center	Various	AEDC:Tullahoma, TN	0.151	-		-		-		-	0.000	0.151	0.000	

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis:</b> PB 2012 Air Force											<b>DATE:</b> February 2011			
<b>APPROPRIATION/BUDGET ACTIVITY</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>				<b>R-1 ITEM NOMENCLATURE</b> PE 0603790F: <i>NATO Cooperative R&amp;D</i>				<b>PROJECT</b> 64NATO: <i>Nato Coop R&amp;D</i>						

  

<b>Test and Evaluation (\$ in Millions)</b>				<b>FY 2011</b>		<b>FY 2012 Base</b>		<b>FY 2012 OCO</b>		<b>FY 2012 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Total Prior Years Cost</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Subtotal</b>			0.551	0.483		0.426		-		0.426	0.000	1.460	0.000

  

<b>Management Services (\$ in Millions)</b>				<b>FY 2011</b>		<b>FY 2012 Base</b>		<b>FY 2012 OCO</b>		<b>FY 2012 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Total Prior Years Cost</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Subtotal</b>			-	-		-		-		-	0.000	0.000	0.000

  

			<b>Total Prior Years Cost</b>	<b>FY 2011</b>		<b>FY 2012 Base</b>		<b>FY 2012 OCO</b>		<b>FY 2012 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Project Cost Totals</b>			4.243	4.372		4.424		-		4.424	0.000	13.039	0.000

  

**Remarks**

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Exhibit R-4, RDT&E Schedule Profile: PB 2012 Air Force		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: <i>Research, Development, Test &amp; Evaluation, Air Force</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	R-1 ITEM NOMENCLATURE PE 0603790F: <i>NATO Cooperative R&amp;D</i>	PROJECT 64NATO: <i>Nato Coop R&amp;D</i>

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Exhibit R-4, RDT&E Schedule Profile: PB 2012 Air Force		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: <i>Research, Development, Test &amp; Evaluation, Air Force</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	R-1 ITEM NOMENCLATURE PE 0603790F: <i>NATO Cooperative R&amp;D</i>	PROJECT 64NATO: <i>Nato Coop R&amp;D</i>

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Exhibit R-4, RDT&E Schedule Profile: PB 2012 Air Force		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: Research, Development, Test & Evaluation, Air Force BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 ITEM NOMENCLATURE PE 0603790F: NATO Cooperative R&D	PROJECT 64NATO: Nato Coop R&D

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Exhibit R-4, RDT&E Schedule Profile: PB 2012 Air Force		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: <i>Research, Development, Test &amp; Evaluation, Air Force</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	R-1 ITEM NOMENCLATURE PE 0603790F: <i>NATO Cooperative R&amp;D</i>	PROJECT 64NATO: <i>Nato Coop R&amp;D</i>

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Exhibit R-4, RDT&E Schedule Profile: PB 2012 Air Force		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: Research, Development, Test & Evaluation, Air Force BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 ITEM NOMENCLATURE PE 0603790F: NATO Cooperative R&D	PROJECT 64NATO: Nato Coop R&D



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Exhibit R-4, RDT&E Schedule Profile: PB 2012 Air Force		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: Research, Development, Test & Evaluation, Air Force BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 ITEM NOMENCLATURE PE 0603790F: NATO Cooperative R&D	PROJECT 64NATO: Nato Coop R&D

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2012 Air Force			<b>DATE:</b> February 2011
<b>APPROPRIATION/BUDGET ACTIVITY</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603790F: <i>NATO Cooperative R&amp;D</i>	<b>PROJECT</b> 64NATO: <i>Nato Coop R&amp;D</i>	

**Schedule Details**

Events	Start		End	
	Quarter	Year	Quarter	Year
Development of Animal Models to Assess the Inhalation Exposure of Engineered Nanomaterials	1	2010	1	2016
Signed Agreement	2	2010	2	2016
- Testing and Analysis	2	2010	2	2010
Final Report	3	2010	4	2010
Modulation of Immune Response by Inhaled Engineered Nanoparticles	1	2010	1	2016
- Signed Agreement	2	2010	2	2016
- Testing and Analysis (1)	2	2010	2	2010
- Final Report	3	2010	4	2010
Image Gyro	1	2010	1	2016
- Signed Agreement (1)	2	2010	2	2016
- Testing and Analysis (2)	2	2010	2	2010
- Final Report (1)	3	2010	4	2010
Durability Assessment and Probabilistic Life Prediction of Titanium Alloys	1	2010	1	2016
- Signed Agreement (2)	2	2010	2	2016
- Testing and Analysis (3)	2	2010	2	2010
- Final Report (2)	3	2010	4	2010
Aging Systems Materials and Process Technologies	1	2010	1	2016
- Signed Agreement (3)	2	2010	2	2016
- Testing and Analysis (4)	2	2010	2	2010
- Final Report (3)	3	2010	4	2010
Military Aircraft Survivability Through Improved Composite Structures	1	2010	1	2010
- Signed Agreement (4)	2	2010	2	2010

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2012 Air Force			<b>DATE:</b> February 2011
<b>APPROPRIATION/BUDGET ACTIVITY</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603790F: <i>NATO Cooperative R&amp;D</i>	<b>PROJECT</b> 64NATO: <i>Nato Coop R&amp;D</i>	

Events	Start		End	
	Quarter	Year	Quarter	Year
- Testing and Analysis (5)	2	2010	2	2011
- Final Report (4)	3	2011	4	2011
Flapping Wing Micro Air Vehicle Collaborative Development	1	2010	1	2010
- Signed Agreement (5)	2	2010	2	2010
- Testing and Analysis (6)	2	2010	2	2011
- Final Report (5)	3	2011	4	2011
Ultrahigh Temperature Ceramics	1	2010	1	2010
- Signed Agreement (6)	2	2010	2	2010
- Testing and Analysis (7)	2	2010	2	2011
- Final Report (6)	3	2011	4	2011
Compact Penetrating Weapons for the Defeat of Hardened Targets	1	2010	1	2010
- Signed Agreement (7)	2	2010	2	2010
- Testing and Analysis (8)	2	2010	2	2011
- Final Report (7)	3	2011	4	2011
Dynamic Network Visualization Techniques for Cyberspace	1	2010	1	2010
- Signed Agreement (8)	2	2010	2	2010
- Testing and Analysis (9)	2	2010	2	2011
- Final Report (8)	3	2011	4	2011
Assessment of Military Operations in Urban Terrain	1	2010	1	2010
- Signed Agreement (9)	2	2010	2	2010
- Testing and Analysis (10)	2	2010	2	2011
- Final Report (9)	3	2011	4	2011
Thermal Barrier Coating Health and Turbine Temperature Sensing	1	2010	1	2010
- Signed Agreement (10)	2	2010	2	2010

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2012 Air Force

**DATE:** February 2011

**APPROPRIATION/BUDGET ACTIVITY**

3600: *Research, Development, Test & Evaluation, Air Force*  
BA 4: *Advanced Component Development & Prototypes (ACD&P)*

**R-1 ITEM NOMENCLATURE**

PE 0603790F: *NATO Cooperative R&D*

**PROJECT**

64NATO: *Nato Coop R&D*

Events	Start		End	
	Quarter	Year	Quarter	Year
- Testing and Analysis (11)	2	2010	2	2011
- Final Report (10)	3	2011	4	2011
Efficacy of Vibrotactile Stimulation in Simulated Operational Conditions	1	2010	1	2010
- Signed Agreement (11)	2	2010	2	2010
- Testing and Analysis (12)	2	2010	2	2011
- Final Report (11)	3	2011	4	2011
Next Generation Advanced Composite Processing Science	1	2010	1	2010
- Signed Agreement (12)	2	2010	2	2010
- Testing and Analysis (13)	3	2010	2	2011
- Final Report (12)	3	2011	4	2011
Machine Translation for International Security Assistance Force	1	2011	1	2011
- Signed Agreement (13)	2	2011	2	2011
Live, Virtual and Constructive Immersive Decision Making Environments	1	2011	1	2011
- Signed Agreement (14)	2	2011	2	2011
- Test and Evaluation	2	2011	4	2011
Robust Solid State Materials for Optical Sensors Protection	1	2011	1	2011
- Signed Agreement (15)	2	2011	2	2011
- Testing and Evaluation	2	2011	4	2011
Common Coalition Airborne Access Portal	1	2011	1	2011
- Signed Agreement (16)	2	2011	2	2011
- Testing and Evaluation (1)	2	2011	4	2011
Rado Frequency Modeling and Simulation for Distributed Electronic Warfare, Situational Awareness and Response	1	2011	1	2011
- Signed Agreement (17)	2	2011	2	2011

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2012 Air Force			<b>DATE:</b> February 2011
<b>APPROPRIATION/BUDGET ACTIVITY</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force</i> BA 4: <i>Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 ITEM NOMENCLATURE</b> PE 0603790F: <i>NATO Cooperative R&amp;D</i>	<b>PROJECT</b> 64NATO: <i>Nato Coop R&amp;D</i>	

Events	Start		End	
	Quarter	Year	Quarter	Year
- Test and Evaluation (1)	2	2011	4	2011
Advanced Ladar and Imaging Analysis System	1	2011	1	2011
- Signed Agreement (18)	2	2011	2	2011
- Testing and Evaluation (2)	2	2011	4	2011
Molecular Basis of Stress Responses Using In Vitro Neuronal Models	1	2011	1	2011
- Signed Agreement (19)	2	2011	2	2011
- Testing and Evaluation (3)	2	2011	4	2011
Synthesis, Formulation and Characterization of Structural Nano-Energetics	1	2011	1	2011
- Signed Agreement (20)	2	2011	2	2011
- Testing and Evaluation (4)	2	2011	4	2011
Monitoring and Controlling Multiple Assets Within Complex Environments	1	2012	4	2015
Closed Loop Alternative Navigation Demonstration	1	2012	4	2015
Joint and Coalition Training, Rehearsal, and Exercise Research	1	2012	4	2016
Life Prediction for Metallic Aircraft Structure	1	2012	4	2013
Aero Advisory and NOTAMS tools	1	2012	4	2014
Cultural Radar for Human Terrain Effects	1	2012	4	2016
Computational Multi-Scale Modeling of Explosives	1	2012	4	2016
High Speed Penetrator Cases	1	2012	4	2016
Team Based Metric Development in Distributed Net-Centric Operations	1	2012	4	2016

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