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<b>Exhibit R-2, RDT&amp;E Budget Item Justification: PB 2011 Air Force</b>	<b>DATE:</b> February 2010
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<b>APPROPRIATION/BUDGET ACTIVITY</b>				<b>R-1 ITEM NOMENCLATURE</b>							
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>							
<b>COST (\$ in Millions)</b>	<b>FY 2009 Actual</b>	<b>FY 2010 Estimate</b>	<b>FY 2011 Base Estimate</b>	<b>FY 2011 OCO Estimate</b>	<b>FY 2011 Total Estimate</b>	<b>FY 2012 Estimate</b>	<b>FY 2013 Estimate</b>	<b>FY 2014 Estimate</b>	<b>FY 2015 Estimate</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
Total Program Element	4.241	4.351	4.372	0.000	4.372	4.439	4.519	4.589	4.656	Continuing	Continuing
64NATO: <i>Nato Coop R&amp;D</i>	4.241	4.351	4.372	0.000	4.372	4.439	4.519	4.589	4.656	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. Program Change Summary (\$ in Millions)**

	<b><u>FY 2009</u></b>	<b><u>FY 2010</u></b>	<b><u>FY 2011 Base</u></b>	<b><u>FY 2011 OCO</u></b>	<b><u>FY 2011 Total</u></b>
Previous President's Budget	4.322	4.351	0.000	0.000	0.000
Current President's Budget	4.241	4.351	4.372	0.000	4.372
Total Adjustments	-0.081	0.000	4.372	0.000	4.372
• Congressional General Reductions		0.000			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		0.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.081	0.000			
• Other Adjustments	0.000	0.000	4.372	0.000	4.372

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Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Air Force		DATE: February 2010
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	
<p><b><u>Change Summary Explanation</u></b></p> <p>FY11: The FY 2010 President's Budget submittal didn not reflect FY 2011 through FY 2015 funding. Therefore, explanation of changes between the two budget positions cannot be made in a relevant mannner.</p>		

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2011 Air Force								<b>DATE:</b> February 2010			
<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>COST (\$ in Millions)</b>	<b>FY 2009 Actual</b>	<b>FY 2010 Estimate</b>	<b>FY 2011 Base Estimate</b>	<b>FY 2011 OCO Estimate</b>	<b>FY 2011 Total Estimate</b>	<b>FY 2012 Estimate</b>	<b>FY 2013 Estimate</b>	<b>FY 2014 Estimate</b>	<b>FY 2015 Estimate</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
64NATO: <i>Nato Coop R&amp;D</i>	4.241	4.351	4.372	0.000	4.372	4.439	4.519	4.589	4.656	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		
<b>A. Mission Description and Budget Item Justification</b>											
<p>These funds will be used to help implement international cooperative research, development, and acquisition (ICRD&amp;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&amp;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&amp;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&amp;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&amp;E Management Support. This PE is designated in Budget Activity 4 because most of the ICRD&amp;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.</p>											
<b>B. Accomplishments/Planned Program (\$ in Millions)</b>											
						<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011 Base</b>	<b>FY 2011 OCO</b>	<b>FY 2011 Total</b>	
MAJOR THRUST: Theater Battle Management Core Systems (TBMCS) and NATO Air Command and Control System Interoperability Analysis and Demonstration (ESC and NATO).						0.150	0.000	0.000	0.000	0.000	
<p><i>FY 2009 Accomplishments:</i> In FY 2009: Cooperative project to proactively design interoperability into the operational and technical architectures of the US Air Operations Center (AOC) and NATO's parallel Combined Air Operations Center (CAOC) construct, and to then develop, test and field middleware software that will support the successful prosecution of a combined/joint air operation.</p>											

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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 Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: In FY 2010: N/A						
FY 2011 Base Plans: In FY 2011: N/A						
FY 2011 OCO Plans: In FY 2011 OCO: N/A						
MAJOR THRUST: Provide the capability for the Coalition/Joint Force Air Component Commander (C/JFACC) Battle Board (AFRL and Australia)		0.100	0.000	0.000	0.000	0.000
FY 2009 Accomplishments: In FY 2009: Cooperative project to provide the capability for the Coalition/Joint Force Air Component Commander (C/JFACC) and senior staff to develop and continuously assess the progress and contribution of air operations to the coalition's air campaign in order to attain agile and stable control of distributed coalition military operations conducted in an uncertain and rapidly changing environment.						
FY 2010 Plans: In FY 2010: N/A						
FY 2011 Base Plans: In FY 2011: N/A						
FY 2011 OCO Plans: In FY 2011 OCO: N/A						
MAJOR THRUST: Development of Electro-Optic and Infrared Countermeasures and Protection Measures (AFRL and UK).		0.300	0.000	0.000	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force				DATE: February 2010		
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 Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: In FY 2009: Cooperative project increasing capabilities in the area of Electro-Optic and Infrared (EO/IR) countermeasures and protection measures for enhancing survivability and force protection.						
FY 2010 Plans: In FY 2010: N/A						
FY 2011 Base Plans: In FY 2011: N/A						
FY 2011 OCO Plans: In FY 2011 OCO: N/A						
MAJOR THRUST: Engagement-level Modeling for HPM Weapons Applications (AFRL and UK).  FY 2009 Accomplishments: In FY 2009: Cooperative project developing useful engagement modeling "modules" that could be used with little or no modification in USAF battlefield modeling and simulation (M&S) exercises.		0.200	0.000	0.000	0.000	0.000
FY 2010 Plans: In FY 2010: N/A						
FY 2011 Base Plans: In FY 2011: N/A						
FY 2011 OCO Plans: In FY 2011 OCO: N/A						
MAJOR THRUST: Hypersonic Flight Research and Development (AFRL and Australia).		0.600	0.000	0.000	0.000	0.000

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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 Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: In FY 2009: Cooperative project researching: (1) conduct hypersonic flight research experiments to mature select critical technologies required to develop future prompt global strike and operationally responsive space access systems; and, (2) develop on-board vehicle and propulsion instrumentation to significantly enrich the technology value of flight experiments.						
FY 2010 Plans: In FY 2010: N/A						
FY 2011 Base Plans: In FY 2011: N/A						
FY 2011 OCO Plans: In FY 2011 OCO: N/A						
MAJOR THRUST: Study of Insensitive Explosives for High Speed Penetrators (AFRL and Germany).		0.375	0.000	0.000	0.000	0.000
FY 2009 Accomplishments: In FY 2009: Cooperative project to understanding the changes in the high explosive (HE) and the effects of those changes due to forces acting on the explosive during hard impact.						
FY 2010 Plans: In FY 2010: N/A						
FY 2011 Base Plans: In FY 2011: N/A						
FY 2011 OCO Plans: In FY 2011 OCO: N/A						

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
MAJOR THRUST: Integrally Bladed Rotor Repair Validation (AFRL and UK).  FY 2009 Accomplishments: In FY 2009: Cooperative project to demonstrate to TRL-6 UK & US developed integrally bladed rotor repair (IBR) in US Provided spin pits and demonstrator engines.  FY 2010 Plans: In FY 2010: N/A  FY 2011 Base Plans: In FY 2011: N/A  FY 2011 OCO Plans: In FY 2011 OCO: N/A		0.200	0.000	0.000	0.000	0.000
MAJOR THRUST: Coalition Airspace Information Sharing (CAIS) (AFRL and NATO).  FY 2009 Accomplishments: In FY 2009: Cooperative project to demonstrate coalition collaborative airspace management by developing and demonstrating a machine-to-machine connection between the US Joint Airspace Management And Deconfliction (JASMAD) Net-centric Information Service and NATO's Airspace Manager (ASMAN) module with the Integrated Command and Control (ICC) system  FY 2010 Plans: In FY 2010: N/A  FY 2011 Base Plans: In FY 2011: N/A		0.400	0.000	0.000	0.000	0.000

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B. Accomplishments/Planned Program (\$ in Millions)					
	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 OCO Plans: In FY 2011 OCO: N/A					
MAJOR THRUST: Distributed Collaboration for Network-Centric Command and Control (AFRL and Australia).  FY 2009 Accomplishments: In FY 2009: Cooperative project to develop network-centric warfare that a dense networking of sensor and shooter nodes to promote enhanced situation awareness (SA) and self-synchronization of forces.  FY 2010 Plans: In FY 2010: N/A  FY 2011 Base Plans: In FY 2011: N/A  FY 2011 OCO Plans: In FY 2011 OCO: N/A	0.200	0.000	0.000	0.000	0.000
MAJOR THRUST: Toxicity of Engineered Nanomaterials and Their Interaction with Biological systems (AFRL and India).  FY 2009 Accomplishments: In FY 2009: Cooperative project to develop nanotoxicoinformatics tools to support nanomaterials research and development across a wide range of applications.  FY 2010 Plans: In FY 2010: N/A	0.100	0.000	0.000	0.000	0.000

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: In FY 2011: N/A						
FY 2011 OCO Plans: In FY 2011 OCO: N/A						
MAJOR THRUST: Mission Planning and NATO Tasking Interoperability (MPNTI) (ESC and UK).  FY 2009 Accomplishments: In FY 2009: Cooperative project to develop a mission planning system that can read NATO message formats. US aircraft mission planning systems do not read nor parse NATO Air Tasking Order (ATO) and NATO Airspace Coordinations Order (ACO) message formats. US air combat tasking is published in the US Message Test Format (USMTF), while NATO uses the Allied Data Publication 3 (AdatP3) message format.		0.375	0.000	0.000	0.000	0.000
FY 2010 Plans: In FY 2010: N/A						
FY 2011 Base Plans: In FY 2011: N/A						
FY 2011 OCO Plans: In FY 2011 OCO: N/A						
MAJOR THRUST: US Theater Battle Management Core Systems (TBMCS) (ESC and NATO).  FY 2009 Accomplishments: In FY 2009: Cooperative project to implement a process/system which will enable multiple C2 systems, each loaded on separate, multiple security networks/domains, to exchange air C2 mission data amongst each of the systems in near-real-time.		0.241	0.000	0.000	0.000	0.000

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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 Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: In FY 2010: N/A						
FY 2011 Base Plans: In FY 2011: N/A						
FY 2011 OCO Plans: In FY 2011 OCO: N/A						
MAJOR THRUST: Development of Animal Models to Assess the Inhalation Exposure of Engineered Nanomaterials (AFRL and Australia).  FY 2009 Accomplishments: In FY 2009: 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.  FY 2010 Plans: In FY 2010: 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.  FY 2011 Base Plans: In FY 2011: N/A  FY 2011 OCO Plans: In FY 2011 OCO: N/A		0.100	0.100	0.000	0.000	0.000
MAJOR THRUST: Modulation of Immune Response by Inhaled Engineered Nanoparticles (AFRL and Sweden).		0.100	0.100	0.000	0.000	0.000

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: In FY 2009: 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.						
FY 2010 Plans: In FY 2010: 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.						
FY 2011 Base Plans: In FY 2011: N/A						
FY 2011 OCO Plans: In FY 2011 OCO: N/A						
MAJOR THRUST: Image Gyro (AFRL and Japan). Cooperative project to develop a new image-based motion sensor known as the "Image Gyro".		0.281	0.350	0.383	0.000	0.383
FY 2009 Accomplishments: In FY 2009: 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.						
FY 2010 Plans: In FY 2010: 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						

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force				DATE: February 2010		
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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
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.  FY 2011 Base Plans: In FY 2011: 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.  FY 2011 OCO Plans: In FY 2011 OCO: N/A						
MAJOR THRUST: Durability Assessment and Probabilistic Life Prediction of Titanium Alloys (AFRL and India).  FY 2009 Accomplishments: In FY 2009: 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.  FY 2010 Plans: In FY 2010: 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		0.200	0.200	0.100	0.000	0.100

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
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.  FY 2011 Base Plans: In FY 2011: 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.  FY 2011 OCO Plans: In FY 2011 OCO: N/A						
MAJOR THRUST: Aging Systems Materials and Process Technologies (AFRL and Australia).  FY 2009 Accomplishments: In FY 2009: 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.  FY 2010 Plans: In FY 2010: 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.		0.075	0.100	0.050	0.000	0.050

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B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: In FY 2011: 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.						
FY 2011 OCO Plans: In FY 2011 OCO: N/A						
MAJOR THRUST: Military Aircraft Survivability Through Improved Composite Structures (USAF 46th Test Wing and Germany).		0.244	0.376	0.000	0.000	0.000
FY 2009 Accomplishments: In FY 2009: 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.						
FY 2010 Plans: In FY 2010: 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.						
FY 2011 Base Plans: In FY 2011: N/A						
FY 2011 OCO Plans: In FY 2011 OCO: N/A						

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B. Accomplishments/Planned Program (\$ in Millions)					
	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
MAJOR THRUST: Flapping Wing Micro Air Vehicle Collaborative Development (AFRL and Korea).  FY 2009 Accomplishments: In FY 2009: N/A  FY 2010 Plans: In FY 2010: Cooperative project to design, develop and test a prototype micro air vehicle.  FY 2011 Base Plans: In FY 2011: Continue cooperative project to design, develop and test a prototype micro air vehicle.  FY 2011 OCO Plans: In FY 2011 OCO: N/A	0.000	0.300	0.100	0.000	0.100
MAJOR THRUST: Ultrahigh Temperature Ceramics (AFRL and UK).  FY 2009 Accomplishments: In FY 2009: N/A  FY 2010 Plans: In FY 2010: Cooperative project to accelerate understanding and development of ultrahigh temperature ceramic materials for system transition.  FY 2011 Base Plans: In FY 2011: Continue cooperative project to accelerate understanding and development of ultrahigh temperature ceramic materials for system transition.  FY 2011 OCO Plans: In FY 2011 OCO: N/A	0.000	0.300	0.250	0.000	0.250
MAJOR THRUST: Compact Penetrating Weapons for the Defeat of Hardened Targets (AFRL - UK).	0.000	0.300	0.400	0.000	0.400

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force				DATE: February 2010		
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 Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: In FY 2009: N/A						
FY 2010 Plans: In FY 2010: Cooperative project to improve maximum penetration and lethal effectiveness capability in weapons for use with advanced fighter aircraft and other aircraft.						
FY 2011 Base Plans: In FY 2011: Cooperative project to improve maximum penetration and lethal effectiveness capability in weapons for use with advanced fighter aircraft and other aircraft.						
FY 2011 OCO Plans: In FY 2011 OCO: N/A						
MAJOR THRUST: Dynamic Network Visualization Techniques for Cyberspace (AFRL - Singapore).		0.000	0.300	0.400	0.000	0.400
FY 2009 Accomplishments: In FY 2009: N/A						
FY 2010 Plans: In FY 2010: Cooperative project to develop visualization and interaction techniques for showing dynamic network information for cyberspace operations.						
FY 2011 Base Plans: In FY 2011: Cooperative project to develop visualization and interaction techniques for showing dynamic network information for cyberspace operations.						
FY 2011 OCO Plans: In FY 2011 OCO: N/A						

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force				DATE: February 2010		
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 Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
MAJOR THRUST: Assessment of Military Operations in Urban Terrain (AFRL - Germany).  FY 2009 Accomplishments: In FY 2009: N/A  FY 2010 Plans: In FY 2010: Cooperative project to investigate the lethality of an array of munitions against military operations against urban terrain targets.  FY 2011 Base Plans: In FY 2011: Cooperative project to investigate the lethality of an array of munitions against military operations against urban terrain targets.  FY 2011 OCO Plans: In FY 2011 OCO: N/A		0.000	0.300	0.300	0.000	0.300
MAJOR THRUST: Thermal Barrier Coating Health and Turbine Temperature Sensing (AFRL and UK).  FY 2009 Accomplishments: In FY 2009: N/A  FY 2010 Plans: In FY 2010: Cooperative project to test thermal barrier coating in suitable environments where common nomenclature, test specification, data format, standardization, and interoperability can be established.  FY 2011 Base Plans: In FY 2011: Cooperative project to test thermal barrier coating in suitable environments where common nomenclature, test specification, data format, standardization, and interoperability can be established.		0.000	0.300	0.350	0.000	0.350

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force				DATE: February 2010		
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 Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 OCO Plans: In FY 2011 OCO: N/A						
MAJOR THRUST: Efficacy of Vibrotactile Stimulation in Simulated Operational Conditions (AFRL and The Netherlands).  FY 2009 Accomplishments: In FY 2009: N/A  FY 2010 Plans: In FY 2010: 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.  FY 2011 Base Plans: In FY 2011: N/A  FY 2011 OCO Plans: In FY 2011 OCO: N/A		0.000	0.300	0.000	0.000	0.000
MAJOR THRUST: Next Generation Advanced Composite Processing Science (AFRL and Canada).  FY 2009 Accomplishments: In FY 2009: N/A  FY 2010 Plans: In FY 2010: 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.		0.000	0.300	0.050	0.000	0.050

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force				DATE: February 2010		
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 Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: In FY 2011: 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.						
FY 2011 OCO Plans: In FY 2011 OCO: N/A						
MAJOR THRUST: Command and Control Interoperability Program (AFRL and UK).  FY 2009 Accomplishments: In FY 2009: N/A  FY 2010 Plans: In FY 2010: 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.  FY 2011 Base Plans: In FY 2011: 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.  FY 2011 OCO Plans: In FY 2011 OCO: N/A		0.000	0.725	0.300	0.000	0.300
MAJOR THRUST: Machine Translation for International Security Assistance Force (711 HPW/RHX).  FY 2009 Accomplishments: In FY 2009: N/A		0.000	0.000	0.100	0.000	0.100

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force				DATE: February 2010		
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 Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: In FY 2010: N/A						
FY 2011 Base Plans: In FY 2011: Cooperative project to build prototype machine translation system for English and German to Dari to support coalition operations in Afghanistan.						
FY 2011 OCO Plans: In FY 2011 OCO: N/A						
MAJOR THRUST: Live, Virtual and Constructive Immersive Decision Making Environments (711 HPW/RHA and Canada).		0.000	0.000	0.300	0.000	0.300
FY 2009 Accomplishments: In FY 2009: N/A						
FY 2010 Plans: In FY 2010: N/A						
FY 2011 Base Plans: In FY 2011: 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.						
FY 2011 OCO Plans: In FY 2011 OCO: N/A						
MAJOR THRUST: Robust Solid State Materials for Optical Sensors Protection (AFRL and Sweden).		0.000	0.000	0.200	0.000	0.200

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force				DATE: February 2010		
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 Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: In FY 2009: N/A						
FY 2010 Plans: In FY 2010: N/A						
FY 2011 Base Plans: In FY 2011: 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.						
FY 2011 OCO Plans: In FY 2011 OCO: N/A						
MAJOR THRUST: Common Coalition Airborne Access Portal (551 ELSW and NATO).		0.000	0.000	0.295	0.000	0.295
FY 2009 Accomplishments: In FY 2009: N/A						
FY 2010 Plans: In FY 2010: N/A						
FY 2011 Base Plans: In FY 2011: Cooperative project will connect US/European lab sites and airborne IP networks via a common access portal that provides interoperability and mulitnational security.						
FY 2011 OCO Plans: In FY 2011 OCO: N/A						
		0.000	0.000	0.294	0.000	0.294

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force				DATE: February 2010		
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 Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
MAJOR THRUST: Radio Frequency (RF) Modeling and Simulation Experimentation for Distributed Electronic Warfare, Situational Awareness and Response (DEWSAR) Project (AFRL/RY and Australia).  FY 2009 Accomplishments: In FY 2009: N/A  FY 2010 Plans: In FY 2010: N/A  FY 2011 Base Plans: In FY 2011: Cooperative project will evaluate distributed electronic support and electronic attack architectures.  FY 2011 OCO Plans: In FY 2011 OCO: N/A						
MAJOR THRUST: Advanced Ladar Imaging Analysis System (AFRL and France).  FY 2009 Accomplishments: In FY 2009: N/A  FY 2010 Plans: In FY 2010: N/A  FY 2011 Base Plans: In FY 2011: 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.		0.000	0.000	0.150	0.000	0.150

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force				DATE: February 2010		
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 Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 OCO Plans: In FY 2011 OCO: N/A						
MAJOR THRUST: Molecular Basis of Stress Responses Using In Vitro Neuronal Models (AFRL and India).  FY 2009 Accomplishments: In FY 2009: N/A  FY 2010 Plans: In FY 2010: N/A  FY 2011 Base Plans: In FY 2011: Cooperative project will enhance warfighter performance optimization through the controlling and monitoring of molecular analytes corresponding to cognitive function and its stressors.  FY 2011 OCO Plans: In FY 2011 OCO: N/A		0.000	0.000	0.050	0.000	0.050
MAJOR THRUST: Synthesis, Formulation and Characterization of Structural Nano-Energetics (AFRL and Singapore).  FY 2009 Accomplishments: In FY 2009: N/A  FY 2010 Plans: In FY 2010: N/A		0.000	0.000	0.300	0.000	0.300

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2011 Air Force				<b>DATE:</b> February 2010							
<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 Program (\$ in Millions)</b>											
		<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011 Base</b>	<b>FY 2011 OCO</b>	<b>FY 2011 Total</b>					
<i>FY 2011 Base Plans:</i> In FY 2011: 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.											
<i>FY 2011 OCO Plans:</i> In FY 2011 OCO: N/A											
Accomplishments/Planned Programs Subtotals		4.241	4.351	4.372	0.000	4.372					
<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011 Base</b>	<b>FY 2011 OCO</b>	<b>FY 2011 Total</b>	<b>FY 2012</b>	<b>FY 2013</b>	<b>FY 2014</b>	<b>FY 2015</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• PE Not Provided (6779): <i>Not Applicable.</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<b>D. Acquisition Strategy</b>											
<p>A principal goal of the NATO Cooperative R&amp;D program is to effectively utilize the aggregate resources invested by the US and our allies in conventional defense R&amp;D. This program element provides the critical funding incentive needed to pursue ICRD&amp;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&amp;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&amp;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.</p>											

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force		DATE: February 2010
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>
<p><b>E. Performance Metrics</b></p> <p>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.</p>		

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: PB 2011 Air Force</b>											<b>DATE:</b> February 2010		
<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>Support (\$ in Millions)</b>													
				<b>FY 2010</b>		<b>FY 2011 Base</b>		<b>FY 2011 OCO</b>		<b>FY 2011 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>
AFRL Hanscom AFB, MA	TBD/TBD	TBD TBD	0.600	0.100		0.000		0.000		0.000	Continuing	Continuing	Continuing
AFRL Eglin AFB, FL	TBD/TBD	TBD TBD	0.200	0.400		0.800		0.000		0.800	Continuing	Continuing	Continuing
ESC Hanscom, MA	TBD/TBD	TBD TBD	0.000	0.400		0.600		0.000		0.600	Continuing	Continuing	Continuing
AFRL Edwards AFB, CA	TBD/TBD	TBD TBD	0.134	0.400		0.000		0.000		0.000	Continuing	Continuing	Continuing
46th Test Wing Eglin AFB, FL	TBD/TBD	TBD TBD	0.300	0.300		0.100		0.000		0.100	Continuing	Continuing	Continuing
AFRL Tyndal AFB, FL	TBD/TBD	TBD TBD	0.000	0.400		0.300		0.000		0.300	Continuing	Continuing	Continuing
AFRL Meza, AZ	TBD/TBD	TBD TBD	0.300	0.400		0.000		0.000		0.000	Continuing	Continuing	Continuing
AFRL Rome, NY	TBD/TBD	TBD TBD	0.200	0.400		0.100		0.000		0.100	Continuing	Continuing	Continuing
AFRL WPAFB, OH	TBD/TBD	TBD TBD	1.919	1.000		1.989		0.000		1.989	Continuing	Continuing	Continuing
<b>Subtotal</b>			3.653	3.800		3.889		0.000		3.889			
<b>Remarks</b>													

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis:</b> PB 2011 Air Force											<b>DATE:</b> February 2010		
<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 2010</b>		<b>FY 2011 Base</b>		<b>FY 2011 OCO</b>		<b>FY 2011 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>
Air Armaments Center, FL	TBD/TBD	TBD TBD	0.300	0.400		0.483		0.000		0.483	Continuing	Continuing	Continuing
Arnold Engineering Development Center, TN	TBD/TBD	TBD TBD	0.288	0.151		0.000		0.000		0.000	Continuing	Continuing	Continuing
<b>Subtotal</b>			0.588	0.551		0.483		0.000		0.483			
<b>Remarks</b>													
			<b>Total Prior Years Cost</b>	<b>FY 2010</b>		<b>FY 2011 Base</b>		<b>FY 2011 OCO</b>		<b>FY 2011 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Project Cost Totals</b>			4.241	4.351		4.372		0.000		4.372			
<b>Remarks</b> Total Prior Years Cost may include only FY 2009 data.													

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Exhibit R-4, RDT&E Schedule Profile: PB 2011 Air Force			DATE: February 2010	
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
ICR&D Project	Fiscal Year	Start Date	End IA	PE
Development of Animal Models to Assess the Inhalation Exposure of Engineered Nanomaterials	FY09	2009	2013	63790F
Modulation of Immune Response by Inhaled Engineered Nanoparticles	FY09	2009	2013	63790F
Image Gyro	FY09	2009	2013	63790F
Durability Assessment and Probablistic Life Prediction of Titanium Alloys	FY09	2009	2013	63790F
Aging Systems Materials and Process Technologies	FY09	2009	2013	63790F
Military Aircraft Survivability through Improved Composite Structures	FY09	2009	2013	63790F
Flapping Wing Micro Air Vehicle Collaboration Development	FY10	2010	2014	63790F
Ultrahigh Temperature Ceramics	FY10	2010	2014	63790F
Compact Penetrating Weapons for the Defeat of Hardened Targets	FY10	2010	2014	63790F
Dynamic Network Visualization Techniques for Cyberspace	FY10	2010	2014	63790F
Assessment of Military Operations in Urban terrain	FY10	2010	2014	63790F
Thermal Barrier Coating Health and Turbine Temperature Sensing	FY10	2010	2014	63790F
Efficacy of Vibrotactile Stimulation in Simulated Operational Conditions	FY10	2010	2014	63790F
Next Generation Advanced Composite Processing Science	FY10	2010	2014	63790F

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Exhibit R-4, RDT&E Schedule Profile: PB 2011 Air Force			DATE: February 2010	
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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2011 Air Force			<b>DATE:</b> February 2010
<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

Event	Start		End	
	Quarter	Year	Quarter	Year
US Theater Battle Management Core System and NATO ACCS signed	1	2009	1	2009
- Test and Analysis	1	2009	2	2009
- Final Report	3	2009	4	2009
Coalition/Joint Force Air Component Commander (C/JFACC) Battle Board	1	2009	1	2009
- Testing and Analysis	1	2009	2	2009
- Final Report (1)	3	2009	4	2009
Development of Electro-Optic & Infrared Countermeasures and Protection Measures	1	2009	1	2009
- Testing and Analysis (2)	1	2009	2	2009
- Final Report (3)	3	2009	4	2009
Engagement-level Modeling for HPM Weapons Applications	1	2009	1	2009
- Testing and Analysis (4)	1	2009	2	2009
- Final Report (5)	4	2009	4	2009
Hypersonic Flight Research and Development	1	2009	1	2009
- Testing and Analysis (6)	1	2009	2	2009
- Final Report (7)	4	2009	4	2009
US Theater Battle Management Core Systems (TBMCS)	1	2009	1	2009
- Testing and Analysis (8)	1	2009	2	2009
- Final Report (9)	3	2009	4	2009

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Exhibit R-4A, RDT&E Schedule Details: PB 2011 Air Force			DATE: February 2010	
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		
	Start		End	
Event	Quarter	Year	Quarter	Year
Coalition Airspace Information Sharing (CAIS)	1	2009	1	2009
- Testing and Analysis (10)	1	2009	2	2009
- Final Report (11)	3	2009	4	2009
Mission Planning and NATO Tasking Interoperability	1	2009	1	2009
- Testing and Analysis (12)	1	2009	2	2009
- Final Report (13)	3	2009	4	2009
Study of Insensitive Explosives for High-Speed Penetrators	1	2009	1	2009
- Testing and Analysis (14)	1	2009	2	2009
- Final Report (15)	2	2009	4	2009
Integrally Bladed Rotor Report Validation	1	2009	1	2009
- Testing and Analysis (16)	1	2009	2	2009
- Final Report (17)	3	2009	4	2009
Distributed Collaboration for Network-Centric Command and Control	1	2009	1	2009
- Testing and Analysis (18)	1	2009	2	2009
- Final Report (19)	3	2009	4	2009
Toxicity of Nano-Engineered Materials	1	2009	1	2009
- Testing and Analysis (20)	1	2009	2	2009
- Final Report (21)	3	2009	4	2009
Development of Animal Models to Assess the Inhalation Exposure of Engineered Nanomaterials	1	2009	1	2009
Signed Agreement	2	2009	2	2009

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Exhibit R-4A, RDT&E Schedule Details: PB 2011 Air Force			DATE: February 2010	
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		
	Start		End	
Event	Quarter	Year	Quarter	Year
- Testing and Analysis (22)	2	2009	2	2010
Final Report	3	2010	4	2010
Modulation of Immune Response by Inhaled Engineered Nanoparticles	1	2009	1	2009
- Signed Agreement	2	2009	2	2009
- Testing and Analysis (23)	2	2009	2	2010
- Final Report (24)	3	2010	4	2010
Image Gyro	1	2009	1	2009
- Signed Agreement (25)	2	2009	2	2009
- Testing and Analysis (26)	2	2009	2	2010
- Final Report (27)	3	2010	4	2010
Durability Assessment and Probabilistic Life Prediction of Titanium Alloys	1	2009	1	2009
- Signed Agreement (28)	2	2009	2	2009
- Testing and Analysis (29)	2	2009	2	2010
- Final Report (30)	3	2010	4	2010
Aging Systems Materials and Process Technologies	1	2009	1	2009
- Signed Agreement (31)	2	2009	2	2009
- Testing and Analysis (32)	2	2009	2	2010
- Final Report (33)	3	2010	4	2010
Military Aircraft Survivability Through Improved Composite Structures	1	2010	1	2010
- Signed Agreement (34)	2	2010	2	2010

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Exhibit R-4A, RDT&E Schedule Details: PB 2011 Air Force			DATE: February 2010	
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		
	Start		End	
Event	Quarter	Year	Quarter	Year
- Testing and Analysis (35)	2	2010	2	2011
- Final Report (36)	3	2011	4	2011
Flapping Wing Micro Air Vehicle Collaborative Development	1	2010	1	2010
- Signed Agreement (37)	2	2010	2	2010
- Testing and Analysis (38)	2	2010	2	2011
- Final Report (39)	3	2011	4	2011
Ultrahigh Temperature Ceramics	1	2010	1	2010
- Signed Agreement (40)	2	2010	2	2010
- Testing and Analysis (41)	2	2010	2	2011
- Final Report (42)	3	2011	4	2011
Compact Penetrating Weapons for the Defeat of Hardened Targets	1	2010	1	2010
- Signed Agreement (43)	2	2010	2	2010
- Testing and Analysis (44)	2	2010	2	2011
- Final Report (45)	3	2011	4	2011
Dynamic Network Visualization Techniques for Cyberspace	1	2010	1	2010
- Signed Agreement (46)	2	2010	2	2010
- Testing and Analysis (47)	2	2010	2	2011
- Final Report (48)	3	2011	4	2011
Assessment of Military Operations in Urban Terrain	1	2010	1	2010
- Signed Agreement (49)	2	2010	2	2010

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Exhibit R-4A, RDT&E Schedule Details: PB 2011 Air Force			DATE: February 2010	
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	
	Start		End	
Event	Quarter	Year	Quarter	Year
- Testing and Analysis (50)	2	2010	2	2011
- Final Report (51)	3	2011	4	2011
Thermal Barrier Coating Health and Turbine Temperature Sensing	1	2010	1	2010
- Signed Agreement (52)	2	2010	2	2010
- Testing and Analysis (53)	2	2010	2	2011
- Final Report (54)	3	2011	4	2011
Efficacy of Vibrotactile Stimulation in Simulated Operational Conditions	1	2010	1	2010
- Signed Agreement (55)	2	2010	2	2010
- Testing and Analysis (56)	2	2010	2	2011
- Final Report (57)	3	2011	4	2011
Next Generation Advanced Composite Processing Science	1	2010	1	2010
- Signed Agreement (58)	2	2010	2	2010
- Testing and Analysis (59)	3	2010	2	2011
- Final Report (60)	3	2011	4	2011
Machine Translation for International Security Assistance Force	1	2011	1	2011
- Signed Agreement (61)	2	2011	2	2011
Live, Virtual and Constructive Immersive Decision Making Environments	1	2011	1	2011
- Signed Agreement (62)	2	2011	2	2011
- Test and Evaluation	2	2011	4	2011
Robust Solid State Materials for Optical Sensors Protection	1	2011	1	2011

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Exhibit R-4A, RDT&E Schedule Details: PB 2011 Air Force			DATE: February 2010	
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	
	Start		End	
Event	Quarter	Year	Quarter	Year
- Signed Agreement (63)	2	2011	2	2011
- Testing and Evaluation	2	2011	4	2011
Common Coalition Airborne Access Portal	1	2011	1	2011
- Signed Agreement (64)	2	2011	2	2011
- Testing and Evaluation (65)	2	2011	4	2011
Rado Frequency Modeling and Simulation for Distributed Electronic Warfare, Situational Awareness and Response	1	2011	1	2011
- Signed Agreement (66)	2	2011	2	2011
- Test and Evaluation (67)	2	2011	4	2011
Advanced Ladar and Imaging Analysis System	1	2011	1	2011
- Signed Agreement (68)	2	2011	2	2011
- Testing and Evaluation (69)	2	2011	4	2011
Molecular Basis of Stress Responses Using In Vitro Neuronal Models	1	2011	1	2011
- Signed Agreement (70)	2	2011	2	2011
- Testing and Evaluation (71)	2	2011	4	2011
Synthesis, Formulation and Characterization of Structural Nano-Energetics	1	2011	1	2011
- Signed Agreement (72)	2	2011	2	2011
- Testing and Evaluation (73)	2	2011	4	2011

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