PE NUMBER: 0603790F
PE TITLE: NATO Cooperative R&D

Exhibit R-2, RDT&E Budget Item Justification

DATE: February 2005

BUDGET ACTIVITY: 04 Advanced Component Development and Prototypes (ACD&P)

PE NUMBER AND TITLE: 0603790F NATO Cooperative R&D

Cost ($ in Millions)	FY 2004 Actual	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total
Total Program Element (PE) Cost	3.605	3.895	3.973	4.048	4.171	4.246	4.345	4.418	Continuing	TBD
NATO Nato Coop R&D	3.605	3.895	3.973	4.048	4.171	4.246	4.345	4.418	Continuing	TBD

(U) 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 (Argentina, Australia, Egypt, Israel, Japan, Jordan, and Rep. of Korea (South Korea), and friendly foreign countries (Austria, Brazil, Bulgaria, Finland, India, Singapore, South Africa, Sweden, Switzerland, and Ukraine). 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.

(U) B. Program Change Summary ($ in Millions)

		FY 2004	FY 2005	FY 2006	FY 2007
(U)	Previous President's Budget	3.930	3.895	3.952	3.972
(U)	Current PBR/President's Budget	3.605	3.895	3.973	4.048
(U)	Total Adjustments	-0.325	0.000		
(U)	Congressional Program Reductions	-0.044			
	Congressional Rescissions	-0.281			
	Congressional Increases				
	Reprogrammings				
	SBIR/STTR Transfer				
(U)	Significant Program Changes:				

Change Summary Explanation: N/A

Exhibit R-2a, RDT&E Project Justification			DATE: February 2005
BUDGET ACTIVITY: 04 Advanced Component Development and Prototypes (ACD&P)	PE NUMBER AND TITLE: 0603790F NATO Cooperative R&D	PROJECT NUMBER AND TITLE: NATO Nato Coop R&D	

Cost ($ in Millions)		FY 2004 Actual	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total
NATO	Nato Coop R&D	3.605	3.895	3.973	4.048	4.171	4.246	4.345	4.418	Continuing	TBD
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0		

(U) 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 (Argentina, Australia, Egypt, Israel, Japan, Jordan, and Rep. of Korea (South Korea), and friendly foreign countries (Austria, Brazil, Bulgaria, Finland, India, Singapore, South Africa, Sweden, Switzerland, and Ukraine). 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.

(U) B. Accomplishments/Planned Program ($ in Millions) — FY 2004 — FY 2005 — FY 2006 — FY 2007

(U) ATLANTIC PAW (AFRL/ France, Germany, UK) - Ongoing cooperative project to develop a common waveform syntax allowing for joint allied communications that will be demonstrated on programmable radio systems in each of the participating nations. In FY03, the waveform interpreter design and the initial specifications of the waveform language will be completed, and rehosted on the US development equipment. The development environment will be completed and used for an international demonstration.

(U) Cooperative Research and Development Efforts in Imaging Spectrometer Development (AEDC/ Canada) - Ongoing cooperative project to pool the spatial and spectral advances of both the US and Canada to produce a hyperspectral infrared (IR) imaging spectrometer. This high-resolution sensor system will be capable of characterizing signatures of rockets and aircraft for drug interdiction and for identifying trace quantities of a broad spectrum of gases in the environment. In FY03, work will continue to enhance the data acquisition and viewing software, instrument ruggedization will continue, and field testing will begin.

(U) Distributed Mission Training (DMT) and Virtual Air Environment (VAE) Technologies (AFRL/ Australia) - Ongoing cooperative project to develop DMT and VAE technologies that will enhance allied simulator based training of US and Australian fighter aircrews and demonstrate proof of concept. DMT

refers to a shared training environment comprised of live, virtual, and constructive simulations allowing warfighters to train individually or collectively at all levels of war. The Australian VAE program will establish a training capability for the Air Defence System using networked simulated and constructive forces. The cooperative project will merge efforts being conducted under these complementary programs. In FY03, the project will continue efforts to (1) develop Australian F-18 multi-task trainers, (2) conduct visual perception and engineering research efforts to specify design requirements for ultra-high resolution visuals for DMT flight simulators, and (3) initiate collaborative long-haul networking and constructive forces development activities.

(U) Engine Component Life Extension (AFRL/ Australia) - Ongoing cooperative project to develop life extension techniques and strategies that can be applied to advanced military engines. The engines involved include the US Air Force F100, -220, -229 and F101 and Australia's TF30, F404 and T700. Much of the technology will be generic and flow from one engine to another. In FY03, development of NDE techniques for characterization of residual stress profiles will conclude; activities to address the shortfalls in life prediction capabilities will conclude, and; the final report will be written.

(U) Flight Test Demonstration of Miniature Munitions Release from Internal Weapons Bay Phase 2 (AFRL/ Australia) - Planned cooperative project to characterize the separation of asymmetric, less stable miniature munitions shapes from internal weapons bays at operational velocities. The Royal Australian Air Force (RAAF) F-111G is the only available operational fighter/bomber, with an internal bay, capable of dropping internally carried munitions at subsonic and supersonic velocities. Additionally, this project will examine emerging technologies for moderating the weapon separation aeroacoustic environment and collecting telemetry through miniature electronic systems rather than high-speed cameras. In FY03, the project team will conduct test planning and preparation, execute the testing, perform analyses, and document the results.

(U) Integrated Tactical Aircraft Control (ITAC) Program (AFRL/France) - Ongoing cooperative project to develop, integrate and demonstrate critical flight control and flight management technologies that enable cooperative flight operations of a package comprised of UCAVs. The cooperative control architecture enables management and control of an integrated strike package by the aircrews in the combat aircraft. In FY03, real-time operator in the loop simulations will be conducted.

(U) Materials and Technologies for Reverse Saturable Absorption (AFRL/ Australia) - Planned cooperative project to develop and characterize platinum poly-ynes materials for possible incorporation in broadband optical limiters in the visible and near infra-red spectral regions for eye and sensor protection from laser device. In FY03, development, testing, and analyses will begin. 0.300

(U) Novel G Protection for Fighter Pilots (AFRL/ Germany) - Planned cooperative project to develop improvements to the Libelle liquid-filled anti-G suit. Efforts will focus on improved relaxed G tolerance, incorporation of positive pressure breathing, improved high altitude protection, and revised anti-G 0.100 0.050

Exhibit R-2a, RDT&E Project Justification		DATE February 2005
BUDGET ACTIVITY 04 Advanced Component Development and Prototypes (ACD&P)	PE NUMBER AND TITLE 0603790F NATO Cooperative R&D	PROJECT NUMBER AND TITLE NATO Nato Coop R&D

	training. In FY03, development work will begin on improved relaxed G tolerance, incorporation of positive pressure breathing, improved high altitude protection, and revised anti-G training.				
(U)	Optical Sensor Protection Development and Evaluation (AFRL/ UK) - Planned cooperative project to develop and assess promising electro-optic protection materials, devices, and configurations for laser hazard and threat protection for eyes and sensors. In FY03, development, testing, and analyses will begin.	0.152	0.000	0.698	
(U)	Spatial Disorientation Countermeasures (AFRL/ The Netherlands) - Planned cooperative project to evaluate the spatial disorientation research device and trainer, called DESDEMONA, and develop improvements. Efforts will focus on assessment of DESDEMONA relative to current simulators, development of night vision goggle and helmet mounted display interfaces, and development of revised training approaches. In FY03, the comparative assessment will be conducted; and the development of night vision goggle and helmet mounted display interfaces, and the development of revised training approaches, will begin.	0.100	0.050		
(U)	Strike Warrior (AFRL/ UK) - Ongoing cooperative project to develop, demonstrate, and test interface technology and concepts for future advanced strike aircraft. It is a follow-on to the Vista Warrior project. The Strike Warrior project will increase the pilot's tactical capabilities with improvements in two related aspects of interface design. First, the interface hardware will be developed to enable better presentation of a larger variety of mission data. This will include large area cockpit displays linked with advanced interface technologies. Second, new approaches to real-time human engineering will be developed to allow the pilot to manage the new display capabilities and information. In FY03, flight testing and trials will continue.	0.750	0.750		
(U)	Assessment of C3 Team Performance in Sustained Operations (AFRL/ Sweden) - Planned cooperative project studying the effects of acute and chronic fatigue in complex decision-making and team performance. This project will use a platform called C3FIRE to assess the effects of fatigue on adaptive team response, agility, and versatility to unpredictable, time-critical and long-duration high-ops tempo events.	0.100	0.130		
(U)	C-2 Warrior (AFRL/ Australia) - Planned cooperative project will develop advanced work-centered interface technologies to enhance ISR Collection Management and Air Space Control operations within an Air Operations Center (AOC). The work-centered interface systems will integrate stereoscopic visualization, speech control, head-eye based control, gesture recognition, intelligent interface agents, and face recognition. By combining technical components within a work-centered organizing framework, an interface client system can be developed that will improve information integration, decision making, and operational execution.	0.300	0.350	0.300	0.050
(U)	Coalition Mission Training (AFRL/ Canada/ UK) - Planned cooperative project is being conducted to enable warfighters to train for coalition air operations while remaining at their home stations. Partner	0.155	0.300	0.245	0.300

Exhibit R-2a, RDT&E Project Justification		DATE February 2005
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	nations will develop distributed simulation technologies, implement a multi-national distributed training network, and conduct a series of coalition force training exercises. Warfighters will use real-time virtual simulators to conduct readiness training for combined air operations within a common synthetic environment. The program sill support incorporation of USAF simulators located outside the Continental US into Distributed Mission Training exercises and will provide the foundation for integrating coalition partners' simulation assets into future multi-national training readiness exercises.			
(U)	Distributed Mission Training (DMT) Technologies (AFRL/ Canada) - Planned cooperative project to develop DMT technologies that will enhance allied simulator based training of fighter aircrews and demonstrate proof of concept. Project will complete research and development of next generation visual systems for DMT to include ultra-high resolution laser projector, image generator, and collimating display screen materials.	0.300	0.271	0.100
(U)	Enhanced C3 Team Training in Sustained Operations (AFRL / The Netherlands) - Planned cooperative project to evaluate team performance in advanced capabilities. This effort will evaluate the effects of fatigue on adaptive team performance in unpredictable, time-critical and long-duration high-ops tempo events. The primary goal will be to enhance a simulated environment for developing operational teamwork under wartime conditions characterized by mental fatigue, uncertainty, unexpected events, high-ops tempo, and/or sustained operations.	0.050	0.025	
(U)	Fit and Accommodation Consulting Tools (AFRL / Canada, The Netherlands) - Planned cooperative project to develop web based, comprehensive, international data system on 3-D body size, shape, fit, and performance. The new data visualization tools will be used to make information more usable, and additional data on pilot performance will be more dynamic.	0.140	0.140	0.140
(U)	High-Power Microwave Narrowband Effects Investigations (AFRL / UK) - Planned cooperative project will conduct High-Power Microwave (HPM) electronics effects experiments in the UK. There is a need for HPM effects information on electronic systems in a statistically significant format with high confidence values in order to investigate the impact of future HPM systems on the battlefield. There is a need to perform test series in order to build up a library of electronic asset response distributions. This cooperative project will perform these needed experiments and tests.	0.075		
(U)				
(U)				
(U)				
(U)	Programmable Integrated Ordnance Suite (PIOS) Phase II (AFRL/ UK) - Planned cooperative project to develop and demonstrate advanced missile ordnance technology. New ordnance suite capability will be achieved by coupling an ability to 'see' the target and select the best aimpoint with the ability to direct the warhead fragments to intercept the target at that specific aimpoint. This will be a continuation of Phase I PIOS.	0.350	0.464	

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(U)	Engine Component Life Enhancement -- Program Continuation (AFRL / MLL/Australia) - Cooperative project that will enabled both country participants to mutually evaluate, develop, and share basic and applied research in materials, life prediction and nondestructive inspection technology areas. This has enabled both countries to attain a greater understanding of the effects of in-service aging of materials, necessary for each country to reach its respective turbine engine component life extension program objectives. The AECLE Program is integral to and directly supportive of AFRL Materials and Manufacturing Directorate's (AFRL / ML's) overarching Engine Rotor Life Extension (ERLE) Initiative. The overall ERLE objective is to safely double the life of fracture-critical turbine engine components, resulting in projected cost avoidances in excess of $1B through 2020 when fully implemented. This FY05 ICR&D Project Nomination seeks ICR&D funding to leverage AFRL / MLL core resources that will be matched, in total, by Australia to implement this new proposal and facilitate continued development and validation of mutually beneficial life extension technologies.		0.300	0.500	0.400
(U)	HPM Effects Testing and Analysis (AFL/DEH/UK) - Planned cooperative project that collect and analyze a body of HPM effects data for selected families of electronic systems and networks that will help to provide much more definitive answers to the questions that face the HPM source design community and the HPM applications designers. The Orion Facility that the UK MOD purchased in the US in 1995 has proved to be the best in the world at varying important parameters of the radiated narrowband, HPM waveforms. The data that is obtained from properly designed experiments in the Orion can be used with rigorous statistical techniques to generate HPM probability-of-effect predictions for the families of electronics that are tested. This information is badly needed to generate the optimum design parameters for future HPM sources.		0.075	0.100	0.100
(U)	Refractive Turbulence and Transient Electronic Disconnectivity (AFRL/VS/Australia) - This Cooperative project falls within the AFRL/VS thrust areas of Surveillance and Force Projection, under which is the Optical Turbulence Program, a technical area driven by the operational requirements of the Airborne Laser (ABL) Program and the High Energy Laser-Joint Technology Office (HEL-JTO) AFRL/CC Memorandum for HQ AFMC/DR, stated requirement for stratospheric turbulence research and improved forecasting capability to support of U-2 and UAV operations. The projected use of directed energy weapons, high band-width laser communication (air-to-air, air-to-ground and air-to-space) and high resolution imagery from manned and unmanned aircraft requires knowledge of and the ability to forecast the location, severity, and duration of refractive turbulence structure that limit system performance.		0.050	0.075	0.075
(U)	Turbine Engine Particulate Matter Emissions (AEDC / UK) - Planned cooperative project to jointly evaluate state-of-the-art particualte measurement instrumentation, modify the instrumentation for robust operation in turbine test cells, develop particulate characterization test procedures, and validate the performance during gas turbine engine (GTE) testing. The project will produce test protocol,	0.383	0.800		0.225

Exhibit R-2a, RDT&E Project Justification			DATE: February 2005
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	instrumentation and procedures, adequate to assess regulatory agency requirements for GTE particulate matter emissions.				
(U)	Management and administrative support and travel	0.200	0.100	0.100	0.100
(U)	Trophoseric Refraction and Propogation Modeling For Airborne Surveillance Systems (AFRL/Australia, UK) - Planned cooperative project to combine a low cost aircraft measurement platform for simultaneous measurements of refraction of Airborne Warning and Control System (AWACS) radar signal strength reduction with parabolic equation methods of microwave propogation modeling for evaluation and prediction of refraction conditions. In FY02, testing and validation were conducted to determine the adverse performace of microwave and infrared systems that perform surveillance, communication, signal intelligence, and direct energy functions in electronic battlespace.	0.150	0.040		
(U)	Hypersonic Airbreathing Propulsion Test (ESC, Germany) - Planned cooperative project will involve complementary testing of a hypersonic engine at both Arnold Air Force Base and Germany Aerospace Center facilities. Ancillary activities will also involve diagnostic and computer model development, application and analysis. New hypersonic flight systems will be similar to conventional aerospace systems, but they will provide their services faster and more routine access to space. Military access to space is the compelling rationale for the hypersonic engine testing. The US is not the leader in hypersonics, and gaining insight from allies is beneficial and will promote commonality.			0.109	0.491
(U)					
(U)	US Theater Battle Management Core Systems (TBMCS) and NATO Air Command and Control System (ACCS) Interoperability analysis and demonstrations (HQ ESC/AFC2ISRC/DO/NATO Air Command and Control System) - Planned cooperative project to proactively design interoperability into te 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 begin with a comprehensive study to examine the Command and Control Systems which are the operational backbone of the US AOC (Theater Battle Management Core Systems) and NATO (Air Command and Control System) There is a USAFE need to have a operational requirement for a seamless, automated information exchange, or "plug and fight", between a US Air Operations Center and a static NATO Combined Air Operations Center or a deployed NATO AOC to allow real-time tasking, execution, and reporting to support joint/combined real-world operations and exercises"			0.550	0.500
(U)	Digital Stand-in Jammer (ADRL/SNZW and AFRL/SNRW) and UK - Planned cooperative project to integrate the UK Digital RF Memory (DRFM) into the US Relocatable Jammer (RLJ) architecture, resulting in a significant capablity to quickly develop and demonstrate advanceed digital electronic attack techniques for transition into stand-in /IAV airborne electronic attack platform. Leveraging the critical enabling technologies of both nations would result in a Digital Stand-in Jammer (a"super RLJ") providing a powerful capacity to quickly program, laboratory test, and field test modern technique			0.400	0.630

Exhibit R-2a, RDT&E Project Justification		DATE February 2005
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	waverforms to counter enemy early warning and acquisition radar systems, and potentially leading to development of a joint flyable UAV payload. The goa of this effort is to leverage advance technologies from each nation to enable substantial, ongoing cooperative advance electronic attack technique collaboration with our closest ally.					
(U)	Network-Centric Strike Controller (AFRL/HECP) - Planned cooperative project to design and develop interface technologies to extend the effectiveness and capabilities of Air Battle Managers (ABMs) working within a network-centric framework. Using simulated AWACS and MC2A work environments, it will make use of networked data, advance data visualization tools, knowledge and contect management systems, decision-aiding and automation algorithms, and advance collaboration interface technologies. This approach will enable greater shared battlespace awareness, more efficient and effective individual and team decision-making, increased speed of command, and adaptablity. Cognitive engineering and user-centered design methodologies will be employed to identify the appropriate information and interface requirement for operators working within the domain.				0.225	0.656
(U)	Policy Enabled Coaltion Communication Environment (PECC) (AFRL/IDCP) and Australia, Canada, United Kingdom - Planned cooperative project that will allow overarching "on Paper" mission objectives to be translated into a set of rules/policies (and machine executable code) which dictate the control level of resources at any level. Initially, policies capable of altering the network posture will be implemented for each INFOCON level (Normal, Alpha, Bravo, Charlie, Delta). Other policies could address operational requirements (e.g. higher network precedence given to a specific application for a short-term mission). In all cases, the cyber commander has an understandable interface for making real-time decisions. The Command and Control Enterprise Management System (C2EMS) will also be integrated to provide: real-time readiness; and understanding of how nework degradation/failture impacts mission accomplishment.				0.310	0.270
(U)	Material and Technologies for Laser Protection (AFRL/MLPJ) and Sweden - Planned cooperative agreement to conduct research, develop, and test passive and active laser protection materials. This will be accomplished by exchanging research expertise and novel nonlinear and electro-optic materials. Each country has specialized expertise in different aspects of passive and active laser protection materials. This exchange of materials, models and data obtained from characterization and testing experiments will facilitate the development of realistic laser protection devices. The US will provide expertise in the areas of nonlinear optical, electro-optical, and matrix materials, US developed materials, experimental facilities, data, and analysis. The Swedish Defence Research Agency) will provide expertise in the area of nonlinear optical, electro-optical, and matrix materials, experimental facilities, data, and analysis. Data gathered on provided samples will be shared. The results of this ICR&D project will be used by the participants, independently, in their own development of actual laser protection devices in future work.				0.121	0.251
(U)	Total Cost	3.605	3.895	3.973	4.048	

Exhibit R-2a, RDT&E Project Justification		DATE February 2005
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(U) C. Other Program Funding Summary ($ in Millions)

FY 2004 Actual	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total Cost

(U) Not Applicable.

(U) D. Acquisition Strategy

A principal goal of the NATO Cooperative R&D program is to effectively utilize the aggregate resources invested by the US and our allies in 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 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. Most contracts are awarded after full and open competition.

Exhibit R-3, RDT&E Project Cost Analysis

DATE: February 2005

BUDGET ACTIVITY: 04 Advanced Component Development and Prototypes (ACD&P)

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(U) Cost Categories (Tailor to WBS, or System/Item Requirements) ($ in Millions)	Contract Method & Type	Performing Activity & Location	Total Prior to FY 2004 Cost	FY 2004 Cost	FY 2004 Award Date	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost to Complete	Total Cost	Target Value of Contract
(U) Product Development														
Sytronics Dayton, OH	CPFF											Continuing	TBD	
Boston College Boston, MA	CFSR											Continuing	TBD	
RADEX Bedford, MA	CPFF											Continuing	TBD	
Pacific Sierra Research Santa Monica, CA	CPFF											Continuing	TBD	
CPI Fairfax, VA	CPFF											Continuing	TBD	
U of Massachusetts Lowell, MA	CR											Continuing	TBD	
KEO Consultants Brookline, MA	CPFF											Continuing	TBD	
NW Research Associates Bellevue, WA	CPFF											Continuing	TBD	
Visdyne Inc.	CPFF											Continuing	TBD	
U of Texas Austin, TX	CPFF											Continuing	TBD	
Applied Research Lab, U of Texas Austin, TX	CPFF											Continuing	TBD	
Lockheed Martin Orlando, FL	CPFF											Continuing	TBD	
Raytheon TI Systems	CPFF											Continuing	TBD	
Boeing Seattle, WA	CPFF											Continuing	TBD	
UES, Inc Dayton, OH	CPFF											Continuing	TBD	
Pratt & Whitney West Palm Beach, FL	CPFF											Continuing	TBD	
AFRL WPAFB, OH	TBD			3.159		3.030		3.302		3.372		Continuing	TBD	
Boeing Long Beach, CA	CPFF											Continuing	TBD	
Boeing Seattle, WA	CPFF											Continuing	TBD	
Lockheed Marietta, GA	CPFF											Continuing	TBD	
Northrop Hawthorne, CA	CPFF											Continuing	TBD	
Selectech Dayton, OH	CPFF											Continuing	TBD	
AFRL Eglin AFB, FL	TBD											Continuing	TBD	
AFRL Hanscom AFB, MA	TBD											Continuing	TBD	
AFRL Mesa, AZ	TBD											Continuing	TBD	
AFRL Rome, NY	TBD											Continuing	TBD	
None													0.000	
Subtotal Product Development			0.000	3.159		3.030		3.302		3.372		Continuing	TBD	0.000
Remarks:														
(U) Support														
AFRL Hanscom AFB, MA								0.550		0.500		Continuing	TBD	
AFRL WPAFB, OH												Continuing	TBD	
45th Space Wing Patrick AFB, FL	AF 185											Continuing	TBD	
AFRL Eglin AFB, FL												Continuing	TBD	
Pender Technology, TN	CR											Continuing	TBD	
Veridian Dayton, OH												Continuing	TBD	
None													0.000	
Subtotal Support			0.000	0.000		0.000		0.550		0.500		Continuing	TBD	0.000
Remarks:														

Exhibit R-3, RDT&E Project Cost Analysis

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BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT NUMBER AND TITLE
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(U) Test & Evaluation										
Air Force Development Test Center, FL	PO							Continuing	TBD	
Sverdrup Technology, Inc TN	CPAF							Continuing	TBD	
Naval Air Warfare CenterPoint Mugu, CA	MIPR							Continuing	TBD	
Fora Laser System	PO							Continuing	TBD	
Arnold Engineering Development Center, TN	TBD		0.248	0.800				Continuing	TBD	
Fora laser system	PO							0.000	0.000	
Subtotal Test & Evaluation		0.000	0.248	0.800	0.000	0.000		Continuing	TBD	0.000
Remarks:										
(U) Management										
			0.200	0.100	0.100	0.100			0.500	
Subtotal Management		0.000	0.200	0.100	0.100	0.100		0.000	0.500	0.000
Remarks:										
(U) Total Cost		0.000	3.607	3.930	3.952	3.972		Continuing	TBD	0.000

Exhibit R-4, RDT&E Schedule Profile

DATE: February 2005

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT NUMBER AND TITLE
04 Advanced Component Development and Prototypes (ACD&P)	0603790F NATO Cooperative R&D	NATO Nato Coop R&D

Name of ICR&D Project & In't Agreement Schedule	Start Date	END IA	PE			
Materials & Technologies for Reverse....	FY 03	FY 05	63790			
Novel G Protection	FY 03	FY 05	63790			
Optical Sensor Protection Development	FY 03	FY 04	63790			
Spatial Disorientation Countermeasures	FY 03	FY 05	63790			
Assessment of C3 Team Performance	FY 04	FY 07	63790			
C-2 Warrior	FY 04	FY 07	63790			
Coalition Mission Training	FY 04	FY 07	63790			
DMT Technologies	FY 04	FY 07	63790			
Enhanced C3 Team Training in Operations	FY 04	FY 07	63790			
Fit and Accommodation Consulting Tools	FY 04	FY 07	63790			
High-Power Microwave Narrowband Effects	FY 04	FY 07	63790			
Programmable Integrated Ordnance (PIOS)	FY 04	FY 07	63790			
Turbine Engine Particulate Matter	FY 04	FY 07	63790			
Engine Component Life Enhancement (Continuation)	FY 05	FY 07	63790			
HPM Effects Testing & Analysis	FY 05	FY 07	63790			
Refractive Turbulence & Transient Electronic Disconnectivity	FY 05	FY 07	63790			
Hyperspectral Data Exploitation	FY05	FY07	63790			
Digital Stand-in Jammer	FY06	FY08	63790			
Network Centic Strike Controller	FY06	FY08	63790			
Policy Enabled Coalition Comm. Environment	FY06	FY08	63790			
US Theater Battle Mgmt Core System & NATO	FY06	FY08	63790			
Material & Technology For Laser Protection	FY06	FY08	63790			

Exhibit R-4, RDT&E Schedule Profile

DATE: February 2005

BUDGET ACTIVITY: 04 Advanced Component Development and Prototypes (ACD&P)

PE NUMBER AND TITLE: 0603790F NATO Cooperative R&D

PROJECT NUMBER AND TITLE: NATO Nato Coop R&D

Name of ICR&D Project & In't Agreement Schedule	Start Date	END IA	PE			
Materials & Technologies for Reverse....	FY 03	FY 05	63790			
Novel G Protection	FY 03	FY 05	63790			
Optical Sensor Protection Development	FY 03	FY 04	63790			
Spatial Disorientation Countermeasures	FY 03	FY 05	63790			
Assessment of C3 Team Performance	FY 04	FY 07	63790			
C-2 Warrior	FY 04	FY 07	63790			
Coalition Mission Training	FY 04	FY 07	63790			
DMT Technologies	FY 04	FY 07	63790			
Enhanced C3 Team Training in Operations	FY 04	FY 07	63790			
Fit and Accommodation Consulting Tools	FY 04	FY 07	63790			
High-Power Microwave Narrowband Effects	FY 04	FY 07	63790			
Programmable Integrated Ordnance (PIOS)	FY 04	FY 07	63790			
Turbine Engine Particulate Matter	FY 04	FY 07	63790			
Engine Component Life Enhancement (Continuation)	FY 05	FY 07	63790			
HPM Effects Testing & Analysis	FY 05	FY 07	63790			
Refractive Turbulence & Transient Electronic Disconnectivity	FY 05	FY 07	63790			
Hyperspectral Data Exploitation	FY05	FY07	63790			
Digital Stand-in Jammer	FY06	FY08	63790			
Network Centic Strike Controller	FY06	FY08	63790			
Policy Enabled Coalition Comm. Environment	FY06	FY08	63790			
US Theater Battle Mgmt Core System & NATO	FY06	FY08	63790			
Material & Technology For Laser Protection	FY06	FY08	63790			

Exhibit R-4a, RDT&E Schedule Detail			DATE February 2005
BUDGET ACTIVITY 04 Advanced Component Development and Prototypes (ACD&P)	PE NUMBER AND TITLE 0603790F NATO Cooperative R&D		PROJECT NUMBER AND TITLE NATO Nato Coop R&D

(U) Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007
(U) Strike Warrior Project	2Q			
(U) Flights test and trials		4Q		
(U) Cooperative R&D Efforts in Imaging Spectrometer Development Project	4Q			
(U) - Field testing	4Q			
(U) - Test report	4Q			
(U) Material and Technologies for Reverse Saturable Absorption	1Q			
(U) - Project agreement signed	2Q			
(U) - Development, testing, and analyses	4Q			
(U) Novel G Protection for Fighter Pilots	2Q			
(U) - Improvements development	4Q			
(U) Optical Sensor Protection Development and Evaluation	2Q			
(U) - Project agreement signed	3Q			
(U) - Development, testing, and analyses	4Q			
(U) Spatial Disorientation Countermeasures	2Q			
(U) - Comparative assessment	4Q			
(U) - Development of improvements	4Q			
(U) Assessment of C3 Team Performance in Sustained Operations		3Q		
(U) Projec agreement signed	2Q			
(U) - Technology development		1Q		
(U) - Experimental studies and data analysis		4Q		
(U) C-2 Warrior		3Q		
(U) - Project agreement signed	3Q			
(U) - Development work-centered interface technologies		4Q		
(U) - Test ISR Collection Manager against new requirements and situation		4Q		
(U) Coalition Mission Training Using Distributed Mission Simulation		4Q		
(U) - Project agreement signed	2Q			
(U) - Develop and test basic systems for coalition operations	4Q			
(U) - Conduct and document coalition exercises in real-time simulators		4Q		
(U) Distributed Mission Training (DMT) Technologies	3Q			
(U) - Signed international agreement	3Q			
(U) - Technology development		4Q		
(U) Fit and Accommodation Consulting Tools		4Q		
(U) - Dynamic and performance data gathering		4Q		

Exhibit R-4a, RDT&E Schedule Detail		DATE February 2005
BUDGET ACTIVITY 04 Advanced Component Development and Prototypes (ACD&P)	PE NUMBER AND TITLE 0603790F NATO Cooperative R&D	PROJECT NUMBER AND TITLE NATO Nato Coop R&D

(U) - Digital pilot profiles and injury potential		4Q		
(U) Enhanced C3 Team Training in Sustained Operations		4Q		
(U) - Project agreement signed	2Q			
(U) - Technology development		2Q		
(U) - Experimental studies and data analysis		4Q		
(U) High-Power Microwave Narrowband Effects Investigations		4Q		
(U) - Develop detailed design baseline		2Q		
(U) - Test high fidelity model and performance analysis		4Q		
(U) - Report system performance results		4Q		
(U) Turbine Engine Particulate Matter Emissions		4Q		
(U) - Project agreement signed	2Q			
(U) - Technology development		4Q		
(U) - Test and analysis		4Q		
(U) Policy Enabled Coalition Communication Environment		3Q		
(U) - Project agreement signed	3Q			
(U) - Technology development		1Q		
(U) - Testing & Analysis		2Q		
(U) Network-Centric Strike Controller				4Q
(U) - Project agreement signed	1Q			
(U) - Testing & Analysis				3Q
(U) Digital Stand-in Jammer		3Q		
(U) - Project agreement signed		3Q		
(U) - Technology Development		1Q		
(U) - Testing & Analysis		4Q		
(U) US Theater Battle Mmgt Core System and NATO ACCS signed				2Q
(U) - Pre-study coordination activities		1Q		
(U) - Study contract award			1Q	
(U) Material and Technologies for Laser Protection	1Q			
(U) - Project agreement signed	1Q			
(U) - Technology Development				3Q
(U) Hypersonic Airbreathing Propulsion Test	4Q			
(U) - Project agreement signed	4Q			
(U) - Development of computer software	4Q			
(U) - Data collection begins	4Q			