

**UNCLASSIFIED**

PE NUMBER: 0603791F  
 PE TITLE: International Space Cooperative R&D

<b>Exhibit R-2, RDT&amp;E Budget Item Justification</b>	DATE <b>February 2004</b>
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<b>BUDGET ACTIVITY</b> <b>04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>PE NUMBER AND TITLE</b> <b>0603791F International Space Cooperative R&amp;D</b>
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Cost (\$ in Millions)	FY 2003 Actual	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	Cost to Complete	Total
Total Program Element (PE) Cost	0.614	0.540	0.552	0.571	0.575	0.592	0.602	0.000	0.000
5035 Intl Space Coop R&D	0.614	0.540	0.552	0.571	0.575	0.592	0.602	0.000	0.000

In FY 2003, from PE 0603790F, 64NATO, NATO Coop R&D, space-related efforts transferred to PE 0603791F, 645035, Intl Space Coop R&D, in order to clearly identify space-related projects and funding.

**(U) A. Mission Description and Budget Item Justification**

These funds will be used to help implement space-related international cooperative research, development, and acquisition (ICRD&A) agreements with North Atlantic Treaty Organization (NATO) member states and major non-NATO allies (Argentina, Australia, Egypt, Israel, Japan, Jordan, and Rep. of Korea (South Korea)) and friendly foreign countries (Austria, 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 space-related 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)**

	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
(U) Previous President's Budget	0.636	0.545	0.553
(U) Current PBR/President's Budget	0.614	0.540	0.552
(U) Total Adjustments	-0.022	-0.005	
(U) Congressional Program Reductions			
Congressional Rescissions		-0.005	
Congressional Increases			
Reprogrammings			
SBIR/STTR Transfer	-0.022		

**(U) Significant Program Changes:**

**Exhibit R-2a, RDT&E Project Justification**

DATE  
**February 2004**

<b>BUDGET ACTIVITY</b> <b>04 Advanced Component Development and Prototypes (ACD&amp;P)</b>				<b>PE NUMBER AND TITLE</b> <b>0603791F International Space Cooperative R&amp;D</b>			<b>PROJECT NUMBER AND TITLE</b> <b>5035 Intl Space Coop R&amp;D</b>			
Cost (\$ in Millions)		FY 2003 Actual	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	Cost to Complete	Total
5035	Intl Space Coop R&D	0.614	0.540	0.552	0.571	0.575	0.592	0.602	0.000	0.000
	Quantity of RDT&E Articles	0	0	0	0	0	0	0		

**(U) A. Mission Description and Budget Item Justification**

These funds will be used to help implement space-related international cooperative research, development, and acquisition (ICRD&A) agreements with North Atlantic Treaty Organization (NATO) member states and major non-NATO allies (Argentina, Australia, Egypt, Israel, Japan, Jordan, and Rep. of Korea (South Korea)) and friendly foreign countries (Austria, 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 space-related 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)**

	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
(U) Hyperspectral Data Exploitation Algorithm Development and Assessment (Air Force Research Lab (AFRL)/ Australia) Planned cooperative project to develop approaches and technologies for improved space-based hyperspectral sensors. FY04, data collection, data analysis, and algorithm validation will begin.	0.614	0.019	
(U) Impacts of the Space Environment on Communications, Navigation, and Surveillance Systems (AFRL/ The United Kingdom (UK)) - Planned cooperative project to develop space weather specification, forecasting techniques, and data displays to provide reliable, timely warning of ionospheric disturbances that will seriously disrupt the performance of space-based communication, navigation and surveillance systems, as well as ground-based surveillance systems such as those employed for early missile warning and missile defense. In FY04, data collection will begin.		0.013	0.205
(U) Space Vehicle Orbit Prediction (AFRL/ France) - Planned cooperative project to use data from a French accelerometer experiment currently on orbit to improve the accuracy of upper atmospheric aerodynamic drag models. This will include solving for short term geomagnetic activity variations. In FY03, modeling algorithms to use the new data will be developed.			
(U) Management and administrative support and travel.			
(U) Hypersonic Airbreathing Propulsion Test (ESC, Germany) - Planned cooperative project will involve complementary		0.233	0.097

Exhibit R-2a, RDT&E Project Justification							DATE February 2004			
BUDGET ACTIVITY			PE NUMBER AND TITLE		PROJECT NUMBER AND TITLE					
<b>04 Advanced Component Development and Prototypes (ACD&amp;P)</b>			<b>0603791F International Space Cooperative R&amp;D</b>		<b>5035 Intl Space Coop R&amp;D</b>					
<p>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 a leader in hypersonics, and gaining insight from allies is beneficial and will promote commonality.</p>										
(U)	Measurement of High-Latitude Ionospheric Structures and System Effects from Northeast Greenland (AFRL/Denmark)						0.275	0.150		
<p>Planned cooperative project to accurately model, simulate, recognize, and forecast polar ionospheric conditions impacting DoD systems. The project will collect multi-instrument measurements of ionospheric conditions at Station Nord in Greenland for the purpose of furthering basic research into mechanisms creating ionospheric disturbances, improving high-latitude ionosphere models, simulations, and providing space weather situational awareness and forecasting tools.</p>										
(U)	Space Vehicle Orbit Prediction (AFRL/ France) - Ongoing cooperative project to use data from a French accelerometer experiment currently on orbit to improve the accuracy of upper atmospheric aerodynamic drag models. This will include solving for short term geomagnetic activity variations. In FY04, modeling algorithms to use the new data will be developed.									
(U)	Cooperation In Navigation Warfare Technology Demonstrator and System Prototype Projects (PA) SMC/GP (GPS Joint Program Office) and ASD/NII/UK - Cooperative project to conduct collaborative studies and cooperatively develop advanced counterSATNAV capabilities that can be employed from current and projected EA platforms. Developed technologies will be jointly tested to assure desired effects are achieved and that there is minimal fratricide impact on friendly forces. Additionally, an initial concept of employment or operations will be collectively developed and tested with the participants in order to assess optimal capabilities in varying threat situations.							0.100		
(U)							0.000			
(U)	Total Cost					0.614	0.540	0.552		
(U)	<b><u>C. Other Program Funding Summary (\$ in Millions)</u></b>									
		<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>Cost to</u>	<u>Total Cost</u>
		<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U)	N/A									
(U)	<b><u>D. Acquisition Strategy</u></b>									
<p>A principal goal of the International Space Cooperative R&amp;D program is to effectively utilize the aggregate resources invested by the US and our allies in space-related R&amp;D. This program element provides the critical funding incentive needed to pursue space-related 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</p>										
Project 5035			R-1 Shopping List - Item No. 47-3 of 47-7				Exhibit R-2a (PE 0603791F)			

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<b>Exhibit R-2a, RDT&amp;E Project Justification</b>		DATE <b>February 2004</b>
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BUDGET ACTIVITY <b>04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	PE NUMBER AND TITLE <b>0603791F International Space Cooperative R&amp;D</b>	PROJECT NUMBER AND TITLE <b>5035 Intl Space Coop R&amp;D</b>
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commitment, projects are selected from existing or new space-related 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.

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Exhibit R-3, RDT&E Project Cost Analysis										DATE February 2004		
BUDGET ACTIVITY 04 Advanced Component Development and Prototypes (ACD&P)				PE NUMBER AND TITLE 0603791F International Space Cooperative R&D				PROJECT NUMBER AND TITLE 5035 Intl Space Coop R&D				
(U) Cost Categories (Tailor to WBS, or System/Item Requirements) (\$ in Millions)	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total</u> Prior to FY 2003 Cost	<u>FY</u> 2003 Cost	<u>FY</u> 2003 Award Date	<u>FY</u> 2004 Cost	<u>FY</u> 2004 Award Date	<u>FY</u> 2005 Cost	<u>FY</u> 2005 Award Date	<u>Cost to Complete</u>	<u>Total</u> Cost	<u>Target</u> Value of Contract
(U) <u>Product Development</u>												
AFRL Hanscom AFB, MA	TBD		0.000							Continuing	TBD	
AFRL, WPAFB				0.614		0.307		0.355			1.276	
AEDC/DO						0.233		0.097			0.330	
SMC, LAAFB, CA								0.100			0.100	
Subtotal Product Development			0.000	0.614		0.540		0.552		Continuing	TBD	0.000
Remarks:												
(U) <u>Support</u>												
AFRL, WPAFB	TBD		0.000							Continuing	TBD	
None											0.000	
Subtotal Support			0.000	0.000		0.000		0.000		Continuing	TBD	0.000
Remarks:												
(U) <u>Test &amp; Evaluation</u>												
TBD	TBD		0.000							Continuing	TBD	
None											0.000	
Subtotal Test & Evaluation			0.000	0.000		0.000		0.000		Continuing	TBD	0.000
Remarks:												
(U) <u>Management</u>												
Subtotal Management			0.000	0.000		0.000		0.000			0.000	0.000
Remarks:												
(U) Total Cost			0.000	0.614		0.540		0.552		Continuing	TBD	0.000

## Exhibit R-4, RDT&amp;E Schedule Profile

DATE

February 2004

BUDGET ACTIVITY

04 Advanced Component Development and Prototypes (ACD&amp;P)

PE NUMBER AND TITLE

0603791F International Space  
Cooperative R&D

PROJECT NUMBER AND TITLE

5035 Intl Space Coop R&amp;D

Name of ICR&D Project & Int Agreement Schedule	Start Date	END IA	PE
Hyperspectral Data Exploitation	FY 03	FY 05	63791
Impacts of the Space Environment	FY 03	FY 05	63791
Space Vehicle Orbit Prediction	FY 03	FY 05	63791
Hypersonic Airbreathing Propulsion Test	FY 04	FY 07	63791
Measurement of High-Latitude	FY 04	FY 07	63791
Cooperation in Navigation Warfare Technology	FY 05	FY 07	63791

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<b>Exhibit R-4a, RDT&amp;E Schedule Detail</b>		DATE <b>February 2004</b>
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<b>(U) <u>Schedule Profile</u></b>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
(U) Hyperspectral Data Exploitation Algorithm Development and Assessment			
(U) - Project Agreement signed	2Q		
(U) - Data collection	4Q		
(U) - Data analysis and algorithm validation	4Q		
(U) - Interim report	4Q		
(U) Impacts of the Space Environment on Comm, Nav, and Surv Sys	3Q		
(U) - Project Agreement signed	4Q		
(U) - Data collection			
(U) Space Vehicle Orbit Prediction	3Q		
(U) - Project Agreement signed	4Q		
(U) - Algorithm development			
(U) Hypersonic Airbreathing Propulsion Test	4Q	4Q	
(U) - Project agreement signed		4Q	
(U) - Development of computer software			
(U) - Data collection begins			
(U) Measurement of High-Latitude Ionospheric Structures and System Effects			
(U) - Project agreement signed	4Q		
(U) - Data collection begins		4Q	