

## UNCLASSIFIED

## RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

DATE

February 2003

## BUDGET ACTIVITY

**04 - Advanced Component Development and Prototypes  
(ACD&P)**

## PE NUMBER AND TITLE

**0603791F International Space Cooperative R&D**

## PROJECT

**5035**

COST (\$ in Thousands)	FY 2002 Actual	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	Cost to Complete	Total Cost
5035 Intl Space Coop R&D	0	636	545	553	573	576	592	601	0	0
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

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**

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.

(U) **FY 2002 (\$ in Thousands)**

(U) \$0 No Activity

(U) \$0 Total

(U) **FY 2003 (\$ in Thousands)**

(U) \$200 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. In FY03, data collection, data analysis, and algorithm validation will begin.

(U) \$300 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

Project 5035

Page 1 of 7 Pages

Exhibit R-2 (PE 0603791F)

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<p>(U) <u><b>A. Mission Description Continued</b></u></p> <p>(U) <u><b>FY 2003 (\$ in Thousands) Continued</b></u></p> <p>as ground-based surveillance systems such as those employed for early missile warning and missile defense. In FY03, data collection will begin.</p> <p>(U) \$43 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.</p> <p>(U) \$93 Management and administrative support and travel.</p> <p>(U) \$636 Total</p> <p>(U) <u><b>FY 2004 (\$ in Thousands)</b></u></p> <p>(U) \$100 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.</p> <p>(U) \$100 Hyperspectral Data Exploitation Algorithm Development and Assessment (Air Force Research Lab (AFRL)/ Australia) - Ongoing cooperative project to develop approaches and technologies for improved space-based hyperspectral sensors. In FY04, data collection, data analysis, and algorithm validation will continue.</p> <p>(U) \$150 Impacts of the Space Environment on Communications, Navigation, and Surveillance Systems (AFRL/ The United Kingdom (UK)) - Ongoing 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 continue.</p> <p>(U) \$100 Measurement of High-Latitude Ionospheric Structures and System Effects from Northeast Greenland (AFRL/Denmark) - 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 forecast tools.</p> <p>(U) \$95 Space Vehicle Orbit Prediction (AFRL/ France) - Ongoing cooperative project to use data from a French accelerometer experiment currently on</p>		
Project 5035	Page 2 of 7 Pages	Exhibit R-2 (PE 0603791F)

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<p>(U) <b><u>A. Mission Description Continued</u></b></p> <p>(U) <b><u>FY 2004 (\$ in Thousands) Continued</u></b></p> <p style="margin-left: 40px;">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.</p> <p>(U) \$0 No Activity</p> <p>(U) \$545 Total</p> <p>(U) <b><u>B. Budget Activity Justification</u></b></p> <p style="margin-left: 40px;">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> <p>(U) <b><u>C. Program Change Summary (\$ in Thousands)</u></b></p> <table style="width: 100%; margin-left: 40px;"> <thead> <tr> <th></th> <th style="text-align: center;"><u>FY 2002</u></th> <th style="text-align: center;"><u>FY 2003</u></th> <th style="text-align: center;"><u>FY 2004</u></th> <th style="text-align: center;"><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>(U) Previous President's Budget</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">657</td> <td></td> </tr> <tr> <td>(U) Appropriated Value</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Appropriated Value</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="margin-left: 20px;">a. Congressional/General Reductions</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="margin-left: 20px;">b. Small Business Innovative Research</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="margin-left: 20px;">c. Omnibus or Other Above Threshold Reprogram</td> <td></td> <td style="text-align: center;">-7</td> <td></td> <td></td> </tr> <tr> <td style="margin-left: 20px;">d. Below Threshold Reprogram</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="margin-left: 20px;">e. Rescissions</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Budget Years Since FY 2003 PBR</td> <td></td> <td style="text-align: center;">643</td> <td style="text-align: center;">-112</td> <td></td> </tr> <tr> <td>(U) Current Budget Submit/FY 2004 PBR</td> <td></td> <td style="text-align: center;">636</td> <td style="text-align: center;">545</td> <td></td> </tr> </tbody> </table> <p>(U) <b><u>Significant Program Changes:</u></b></p>				<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>Total Cost</u>	(U) Previous President's Budget	0	0	657		(U) Appropriated Value					(U) Adjustments to Appropriated Value					a. Congressional/General Reductions					b. Small Business Innovative Research					c. Omnibus or Other Above Threshold Reprogram		-7			d. Below Threshold Reprogram					e. Rescissions					(U) Adjustments to Budget Years Since FY 2003 PBR		643	-112		(U) Current Budget Submit/FY 2004 PBR		636	545	
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(U) **D. Other Program Funding Summary (\$ in Thousands)**

	<u>FY 2002</u>	<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>Estimate</u>	<u>Complete</u>	
(U) AF RDT&E										
(U) Other APPN										

(U) **E. Acquisition Strategy**

A principal goal of the International Space Cooperative R&D program is to effectively utilize the aggregate resources invested by the US and our allies in space-related R&D. This program element provides the critical funding incentive needed to pursue space-related 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 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.

(U) **F. Schedule Profile**

	<u>FY 2002</u>				<u>FY 2003</u>				<u>FY 2004</u>			
	1	2	3	4	1	2	3	4	1	2	3	4
(U) Hyperspectral Data Exploitation Algorithm Development and Assessment												
(U) - Project Agreement signed						X						
(U) - Data collection						X	X	X				
(U) - Data analysis and algorithm validation							X	X				
(U) - Interim report								X				
(U) Impacts of the Space Environment on Comm, Nav, and Surv Sys												
(U) - Project Agreement signed						X	X					
(U) - Data collection							X	X				
(U) Space Vehicle Orbit Prediction												
(U) - Project Agreement signed						X	X					

Project 5035

Page 4 of 7 Pages

Exhibit R-2 (PE 0603791F)

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2003																																																																																																																																				
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In addition, information on the use of future funding for agreements is not available in all instances because the funds are used as needed to supplement a project office's related 6.1 through 6.5 RDT&amp;E appropriations.</p> <p>(U) <b><u>B. Budget Acquisition History and Planning Information (\$ in Thousands)</u></b></p> <p>(U) <b><u>Performing Organizations:</u></b></p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Contractor or Government Performing Activity</u></th> <th style="text-align: left;"><u>Contract Method/Type or Funding Vehicle</u></th> <th style="text-align: left;"><u>Award or Obligation Date</u></th> <th style="text-align: left;"><u>Performing Activity EAC</u></th> <th style="text-align: left;"><u>Project Office EAC</u></th> <th style="text-align: right;"><u>Total Prior to FY 2002</u></th> <th style="text-align: right;"><u>Budget FY 2002</u></th> <th style="text-align: right;"><u>Budget FY 2003</u></th> <th style="text-align: right;"><u>Budget FY 2004</u></th> <th style="text-align: left;"><u>Budget to Complete</u></th> <th style="text-align: right;"><u>Total Program</u></th> </tr> </thead> <tbody> <tr> <td colspan="11"><u>Product Development Organizations</u></td> </tr> <tr> <td>AFRL Hanscom AFB, MA</td> <td>TBD</td> <td>TBD</td> <td></td> <td></td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">636</td> <td style="text-align: right;">345</td> <td>Continuing</td> <td style="text-align: right;">TBD</td> </tr> <tr> <td>AFRL, WPAFB</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: right;">100</td> <td></td> <td style="text-align: right;">100</td> </tr> <tr> <td>ESC</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: right;">100</td> <td></td> <td style="text-align: right;">100</td> </tr> <tr> <td colspan="11"><u>Support and Management Organizations</u></td> </tr> <tr> <td>AFRL, WPAFB</td> <td>TBD</td> <td>TBD</td> <td></td> <td></td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td>Continuing</td> <td style="text-align: right;">TBD</td> </tr> <tr> <td colspan="11"><u>Test and Evaluation Organizations</u></td> </tr> <tr> <td>TBD</td> <td>TBD</td> <td>TBD</td> <td></td> <td></td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td></td> <td>Continuing</td> <td style="text-align: right;">TBD</td> </tr> </tbody> </table>										<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	(U) Hyperspectral Data Exploitation Algorithm Development and Assessment	0	200	100	(U) Impacts of the Space Environment on Communications, Navigation, and Surveillance Systems	0	300	150	(U) Space Vehicle Orbit Prediction		43	95	(U) Hypersonic Airbreathing Propulsion Test			100	(U) Measurement of High-Latitude Ionospheric Structures and System Effects from Northeast Greenland			100	(U) Management support		93	0	(U) Total	0	636	545	<u>Contractor or Government Performing Activity</u>	<u>Contract Method/Type or Funding Vehicle</u>	<u>Award or Obligation Date</u>	<u>Performing Activity EAC</u>	<u>Project Office EAC</u>	<u>Total Prior to FY 2002</u>	<u>Budget FY 2002</u>	<u>Budget FY 2003</u>	<u>Budget FY 2004</u>	<u>Budget to Complete</u>	<u>Total Program</u>	<u>Product Development Organizations</u>											AFRL Hanscom AFB, MA	TBD	TBD			0	0	636	345	Continuing	TBD	AFRL, WPAFB								100		100	ESC								100		100	<u>Support and Management Organizations</u>											AFRL, WPAFB	TBD	TBD			0	0	0	0	Continuing	TBD	<u>Test and Evaluation Organizations</u>											TBD	TBD	TBD			0	0	0		Continuing	TBD
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(U) Management support		93	0																																																																																																																																								
(U) Total	0	636	545																																																																																																																																								
<u>Contractor or Government Performing Activity</u>	<u>Contract Method/Type or Funding Vehicle</u>	<u>Award or Obligation Date</u>	<u>Performing Activity EAC</u>	<u>Project Office EAC</u>	<u>Total Prior to FY 2002</u>	<u>Budget FY 2002</u>	<u>Budget FY 2003</u>	<u>Budget FY 2004</u>	<u>Budget to Complete</u>	<u>Total Program</u>																																																																																																																																	
<u>Product Development Organizations</u>																																																																																																																																											
AFRL Hanscom AFB, MA	TBD	TBD			0	0	636	345	Continuing	TBD																																																																																																																																	
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Project 5035					Page 6 of 7 Pages		Exhibit R-3 (PE 0603791F)																																																																																																																																				

## UNCLASSIFIED

## RDT&amp;E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)

DATE

February 2003

BUDGET ACTIVITY

**04 - Advanced Component Development and Prototypes  
(ACD&P)**

PE NUMBER AND TITLE

**0603791F International Space Cooperative R&D**

PROJECT

**5035**

(U) Government Furnished Property:

<u>Item</u>	<u>Contract</u> <u>Method/Type</u> <u>or Funding</u>	<u>Award or</u> <u>Obligation</u> <u>Date</u>	<u>Delivery</u> <u>Date</u>	<u>Total Prior</u> <u>to FY 2002</u>	<u>Budget</u> <u>FY 2002</u>	<u>Budget</u> <u>FY 2003</u>	<u>Budget</u> <u>FY 2004</u>	<u>Budget to</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
<u>Product Development Property</u>									
None									
<u>Support and Management Property</u>									
None									
<u>Test and Evaluation Property</u>									
None									
<u>Subtotals</u>				<u>Total Prior</u> <u>to FY 2002</u>	<u>Budget</u> <u>FY 2002</u>	<u>Budget</u> <u>FY 2003</u>	<u>Budget</u> <u>FY 2004</u>	<u>Budget to</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
Subtotal Product Development				0	0	636	545	TBD	TBD
Subtotal Support and Management				0	0	0	0	TBD	TBD
Subtotal Test and Evaluation				0	0	0		TBD	TBD
Total Project				0	0	636	545	TBD	TBD

Project 5035

Page 7 of 7 Pages

Exhibit R-3 (PE 0603791F)