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 0603791F: *International Space Cooperative R&D*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	0.603	0.632	0.635	0.000	0.635	0.644	0.654	0.664	0.673	Continuing	Continuing
645035: *Intl Space Coop R&D*	0.603	0.632	0.635	0.000	0.635	0.644	0.654	0.664	0.673	Continuing	Continuing

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 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 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.

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 0603791F: *International Space Cooperative R&D*

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	0.620	0.632	0.000	0.000	0.000
Current President's Budget	0.603	0.632	0.635	0.000	0.635
Total Adjustments	-0.017	0.000	0.635	0.000	0.635
• 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	0.000	0.000			
• Other Adjustments	-0.017	0.000	0.635	0.000	0.635

Change Summary Explanation

FY11: The 2010 President's Budget submittal did not reflect FY 2011 through FY2015 funding. Therefore, explanation of changes between the two budget positions cannot be made in a relevant manner.

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 0603791F: *International Space Cooperative R&D*	PROJECT 645035: *Intl Space Coop R&D*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
645035: *Intl Space Coop R&D*	0.603	0.632	0.635	0.000	0.635	0.644	0.654	0.664	0.673	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

These funds will be used to help implement space-related international cooperative research, development, and acquisition (ICRD&A) agreements with North Atlantic Treaty Organization (NATO) member states and 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 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.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
MAJOR THRUST: Multidemsional Diffusion of High Energy Radiation Belt Electrons (AFRL and UK).	0.220	0.000	0.000	0.000	0.000
FY 2009 Accomplishments: In FY09: Cooperative project to study high energy electrons constituting the radiation belts are a primary hazard for USAF and other satellites. They are often enhanced during geomagnetic storms, but not in a reliably predictable way. Thus, understanding and forecasting their behavior is a major research goal. The physics of the radiation belts is believed to be largely controlled by electromajnetic					

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 0603791F: *International Space Cooperative R&D*	PROJECT 645035: *Intl Space Coop R&D*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
waves, which casue diffusion in the otherwise constant particle energy, equatorial pitch angle, and radial distance. *FY 2010 Plans:* In FY10: N/A *FY 2011 Base Plans:* In FY11: N/A *FY 2011 OCO Plans:* In FY11 OCO: N/A					
MAJOR THRUST: Surveillance and Military Utility of Hyperspectral Imagery in the Reflective and Emissive Spectral Bands (AFRL and Australia). *FY 2009 Accomplishments:* In FY09: Cooperative project will advance imaging spectroscopy for military remote sensing in two ways. The first and initial focus of the effort will be the quantification of the military utility of space-based hyperspectral imagery in the reflective spectrum (0.38 to 2.5 microns) utilizing extensive datasets taken with the TacSat-3/Advanced Responsive Tactically Effective Military Imaging Spectrometer over both U. S. and Australian sites. *FY 2010 Plans:* In FY10: Cooperative project will advance imaging spectroscopy for military remote sensing in two ways. The first and initial focus of the effort will be the quantification of the military utility of space-based hyperspectral imagery in the reflective spectrum (0.38 to 2.5 microns) utilizing extensive datasets taken with the TacSat-3/Advanced Responsive Tactically Effective Military Imaging Spectrometer over both U. S. and Australian sites.	0.383	0.400	0.000	0.000	0.000

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 0603791F: *International Space Cooperative R&D*	PROJECT 645035: *Intl Space 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 FY11: N/A *FY 2011 OCO Plans:* In FY11 OCO: N/A					
MAJOR THRUST: Energy Transport by Neutral Winds During Magnetic Storms (AFRL and France). *FY 2009 Accomplishments:* In FY09: N/A *FY 2010 Plans:* In FY10: Cooperative project to develop a database of neutral wind values in the Ionophere-Thermosphere, using the Neutral Wind Meter on Comm/Nav outage Forcast System together with the STAR accelerometers on the CHAMP and GRACE spacecraft. This research will establish a set of unprecedented neutral wind values and allow for the first reliable estaime of neutral energy transport during storms. *FY 2011 Base Plans:* In FY11: Cooperative project to develop a database of neutral wind values in the Ionophere-Thermosphere, using the Neutral Wind Meter on Comm/Nav outage Forcast System together with the STAR accelerometers on the CHAMP and GRACE spacecraft. This research will establish a set of unprecedented neutral wind values and allow for the first reliable estaime of neutral energy transport during storms. *FY 2011 OCO Plans:* In FY11 OCO: N/A	0.000	0.232	0.285	0.000	0.285
MAJOR THRUST: Post Mission Analysis of High Frequency (HF) Radar (AFSPC and Australia).	0.000	0.000	0.350	0.000	0.350

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 0603791F: *International Space Cooperative R&D*	**PROJECT** 645035: *Intl Space 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 FY09: N/A *FY 2010 Plans:* In FY10: N/A *FY 2011 Base Plans:* In FY11: Overhead Persistent Infrared (OPIR) Data Fusion Experiments of Early Launch Detection and Tracking (AFSPC and Australia) - Cooperative project will leverage US and Australian expertise in fusing HF and OPIR Radar. The Australian HF Radar SkyWave Line-of-Sight (SkyLOS) component technologies when combined with OPIR provide a significant improvement over OPIR sensors alone. The integration of the can achieve a potential force enhancer for ballistic missile defense and warning applications. *FY 2011 OCO Plans:* In FY11 OCO: N/A					
Accomplishments/Planned Programs Subtotals	0.603	0.632	0.635	0.000	0.635

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• PE Not Provided (7596): *Activity Not Provided*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

D. 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

Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force		DATE: February 2010
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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.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: 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 0603791F: *International Space Cooperative R&D*	PROJECT 645035: *Intl Space Coop R&D*

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
AFRL, WPAFB	TBD/TBD	TBD TBD	0.110	0.143	Feb 2010	0.199	Dec 2010	0.000		0.199	Continuing	Continuing	Continuing
AFRL EDWARDS AFB, CA	TBD/TBD	TBD TBD	0.493	0.389	Feb 2010	0.100	Dec 2010	0.000		0.100	Continuing	Continuing	Continuing
Space System Center	TBD/TBD	TBD TBD	0.000	0.000		0.200	Dec 2010	0.000		0.200	0.000	0.200	0.000
		Subtotal	0.603	0.532		0.499		0.000		0.499			

Remarks

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
AFRL EDWARDS AFB, CA	TBD/TBD	TBD TBD	0.000	0.100	Mar 2010	0.136	Dec 2010	0.000		0.136	Continuing	Continuing	Continuing
		Subtotal	0.000	0.100		0.136		0.000		0.136			

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: 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 0603791F: *International Space Cooperative R&D*	PROJECT 645035: *Intl Space Coop R&D*	

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.603	0.632		0.635		0.000		0.635			

Remarks

Total Prior Years Cost may include only FY 2009 data.

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 0603791F: *International Space Cooperative R&D*	PROJECT 645035: *Intl Space Coop R&D*

ICR&D Project	Fiscal Year	Start Date	End IA	PE
Forecasting Communication and Navigation Disruptions due to Inospheric Disturbance During Solar Minimum	FY06	2007	2011	63791F
Multidimensional Diffusion of High Energy Radiation Belt Electrons	FY07	2008	2013	63791F
Surveillance and Military Utility of Hyperspectral Imagery in the Reflective and Emissive Spectral Bands	FY09	2009	2014	63791F
Energy Transport by Neutral Winds During Magnetic Storms	FY10	2010	2015	63791F
High Frequency Radar – Overhead Persistent Infrared Data Fusion Experiments for Early Launch Detection and Tracking	FY11	2011	2016	63791F

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 0603791F: *International Space Cooperative R&D*	**PROJECT** 645035: *Intl Space Coop R&D*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Multidimensional Diffusion of High Energy Radiation Belt Electrons	1	2009	1	2009
- Study	1	2009	2	2009
- Final Report	4	2009	4	2009
Surveillance and Military Utility of Hyperspectral Imagery in the Reflective and Emissive Spectral Bands	1	2009	1	2009
- Technical development	1	2009	4	2009
- Test and anylsis	1	2010	4	2010
- Final Report (1)	1	2010	1	2010
Energy Transport by Neutral Winds During Magnetic Storms	1	2010	1	2010
- Technical Development (2)	1	2010	4	2010
- Test and analysis	1	2011	4	2011
Post Mission Analysis of High Frequency Radar - Overhead Persistant Infrared Data Fusion Experiments for Early Launch Detection and Tracking	1	2011	1	2011
- Technical Development (3)	1	2011	4	2011