Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Air Force										DATE: February 2011	
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603742F: *Combat Identification Technology*							
COST ($ in Millions)	**FY 2010**	**FY 2011**	**FY 2012 Base**	**FY 2012 OCO**	**FY 2012 Total**	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**Cost To Complete**	**Total Cost**
Total Program Element	27.850	26.172	38.496	-	38.496	24.683	25.052	25.411	25.858	Continuing	Continuing
642597: *Noncooperative Identification Subsystems*	24.319	23.557	36.405	-	36.405	22.836	23.178	23.512	23.926	Continuing	Continuing
642599: *Cooperative Identification Techniques*	3.531	2.615	2.091	-	2.091	1.847	1.874	1.899	1.932	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Combat Identification (CID) Technology program element analyzes, develops, demonstrates and evaluates promising target identification technologies to facilitate platform transition decisions prior to System Development and Demonstration (SDD). Numerous joint needs statements, operational documents, lessons learned, and NATO requirements state the need for positive CID. High confidence CID increases combat effectiveness, prevents fratricide, and reduces collateral damage. It also enables combatant commanders to effectively command and control their forces in all weather, day or night. This program element focuses on the cooperative and non-cooperative technologies that have the capability to positively identify surface and air targets in both air-to-surface and air-to-air engagements.

In order to rapidly make available promising CID technologies for platform SDD decisions, the program element funds design studies, engineering analysis, non-recurring engineering, and other efforts associated with integration and modification of CID related technologies and systems on platforms. It also supports the development, testing, and implementation of international standards (to include NATO standardization agreements) to ensure joint, Allied, and coalition interoperability.

Non-cooperative CID employs a number of sensing technologies and signal processing techniques. The observations may be compared to a database of known objects to identify surface or air threats from air platforms. These technologies include: (1) Laser Vision, an electro-optical/infrared (EO/IR) imaging system that significantly increases ID ranges and includes exploiting synergies between non-cooperative and cooperative ID systems (radio, millimeter wave, infrared, and laser). The Laser Target Imagining Program (LTIP) is working on performance improvements, laser vibrometry development, 3-dimensional laser detection and ranging, laser radar, synthetic aperture laser (SAL) radar, aided/automatic target recognition, image fusion and studies to support decisions on future EO/IR technologies; (2) Radar Vision, an air-to-ground radar imaging technique to identify stationary and moving targets using their radar signatures; (3) Hydra Vision (Multi Sensor Enhanced ID; formerly Fusion Vision), a balanced (robust) amalgamation of sensor data from multiple sources to provide warfighters with higher confidence CID results on surface or air targets; and (4) X-Patch, a validated set of prediction codes and analysis tools that use the shooting-and-bouncing ray (SBR) method to predict realistic far-field radar signatures from 3D target models in order to predict 1D and/or 2D data. X-Patch is vital for development of radar signatures of potential high-threat weapons systems; it is a critical capability of database production centers which support Joint Sensors Signature Database (JSSD) pathfinders.

Cooperative CID employs technologies required to rapidly identify friendly platforms. The program develops, integrates and evaluates technologies that provide AF platforms with a means of positively identifing an air or ground platform as a friendly, via active or passive cooperative ID capabilities. Development funded by this program element ensures availability of a Mode 5 upgrade path for implementing ground and air platforms across the Air Force fleet. Within the air-to-air domain, programs funded to meet this intent include: (1) Mode 5 Technology Insertion Program (TIP): The program element funds preliminary RDT&E for Mark XIIA, the next

Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Air Force	DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603742F: *Combat Identification Technology*

generation Identification Friend or Foe (IFF) standard for the DoD and NATO. Mark XIIA represents a substantial enhancement to the Mark XII IFF system. It is expected to achieve joint initial operational capability in 2014. The "A" denotes the addition of Mode 5 (an encrypted challenge-and-reply mode) to the other Mark XII system modes (Modes 1, 2, 3/A, C, S, and 4). The Mode 5 secure IFF program is a DoD-wide, Navy-led development and acquisition program. The Mode 5 TIP specifically addresses implementing air platforms. (2) Automatic Dependent Surveillance-Broadcast (ADS-B)TIP: This program element will fund preliminary RDT&E for integration of ADS-B architecture into the APX-119 Mark XIIA transponder. The ADS-B TIP will develop ADS-B "In" and "out" capability which leverages synergies between ADS-B and Mode 5 Level 2 (M5L2) to achieve M5L2 "In" capability. The ADS-B TIP specifically addresses implementing air platforms. (3) Digital IFF Control Panel: This program element is developing a Digital IFF Control Panel (DCP) to support Mode 5 and ADS-B insertion programs into Air Force platforms with an ARINC (Aeronautics Research Incorporated) 429 based avionics architecture. The DCP will provide a standard control panel for AF aircraft with growth capability for ADS-B and beyond.

Joint Cooperative Target Identification – Ground (JCTI-G) Analysis of Alternatives (AoA). This is an OSD AT&L directed program for the services. The Army will lead the Fires on Dismount (FoD) portion and the USAF will lead the Air to Ground (A-G) portion. The Army and USAF are negotiating an MOA for the stand up of a Joint Program Office (JPO).

Within the air-to-ground domain, development funded by this program element ensures development, integration, test and evaluation of friendly identification systems focused on reducing air-to-ground fratricide. Programs funded to meet this intent include: (1) Radio Based Combat Identification: An active challenge reply system leveraging Single Channel Ground and Airborne Radio System (SINCGARS) capable ground and aircraft targeting pod mounted radios for air-to-ground friendly identification and (2) Laser Frequency Responsive Tape: A low cost, un- powered passive device to aid in the detection of friendly ground forces via airborne electro-optical sensors.

This program element also funds the Air Traffic Control Beacon Systems Identification Friend or Foe Mark XII/XIIA Systems (AIMS) Program Office. The DoD International AIMS PO has system level interoperability management responsibilities for the present Mark XII system, development and integration of Mark XIIA (Mode 5) and transition to Mark XIIA Mode S systems.

This program is in Budget Activity 4, Advanced Component Development and Prototypes (ACD&P) because efforts are necessary to evaluate integrated technologies, representative modes or prototype systems in a high fidelity and realistic operating environment.

Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Air Force	DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603742F: *Combat Identification Technology*

B. Program Change Summary ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Previous President's Budget	28.799	26.172	25.920	-	25.920
Current President's Budget	27.850	26.172	38.496	-	38.496
Total Adjustments	-0.949	-	12.576	-	12.576
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-0.120	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.829	-			
• Other Adjustments	-	-	12.576	-	12.576

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2010	FY 2011
Project: 642597: *Noncooperative Identification Subsystems*		
Congressional Add: *Fast Steering Mirror*	1.590	-
Congressional Add Subtotals for Project: 642597	1.590	-
Congressional Add Totals for all Projects	1.590	-

Change Summary Explanation

The FY12 $12.7M funding increase is to continue the Automatic Dependent Surveillance-Broadcast (ADS-B) capability development in the APX-119 transponder.

Beginning in FY12, funding for the ADS-B development of the APX-119 transponder will be transferred to BPAC 642599.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Air Force			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603742F: *Combat Identification Technology*	PROJECT 642597: *Noncooperative Identification Subsystems*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
642597: *Noncooperative Identification Subsystems*	24.319	23.557	36.405	-	36.405	22.836	23.178	23.512	23.926	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Non-cooperative CID employs a number of sensing technologies and signal processing techniques. The observations may be compared to a database of known objects to identify surface or air threats from air platforms. These technologies include: (1) Laser Vision, an electro-optical/infrared (EO/IR) imaging system that significantly increases ID ranges and includes exploiting synergies between non-cooperative and cooperative ID systems (radio, millimeter wave, infrared, and laser). The Laser Target Imagining Program (LTIP) is working on performance improvements, laser vibrometry development, 3-dimensional laser detection and ranging, laser radar, synthetic aperture laser (SAL) radar, aided/automatic target recognition, image fusion and studies to support decisions on future EO/IR technologies; (2) Radar Vision, an air-to-ground radar imaging technique to identify stationary and moving targets using their radar signatures; (3) Hydra Vision (Multi Sensor Enhanced ID; formerly Fusion Vision), a balanced (robust) amalgamation of sensor data from multiple sources to provide warfighters with higher confidence CID results on surface or air targets; and (4) X-Patch, a validated set of prediction codes and analysis tools that use the shooting-and-bouncing ray (SBR) method to predict realistic far-field radar signatures from 3D target models in order to predict 1D and/or 2D data. X-Patch is vital for development of radar signatures of potential high-threat weapons systems; it is a critical capability of database production centers which support Joint Sensors Signature Database (JSSD) pathfinders.

This program is in Budget Activity 4, Advanced Component Development and Prototypes (ACD&P) because efforts are necessary to evaluate integrated technologies, representative modes or prototype systems in a high fidelity and realistic operating environment.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: Laser Vision	0.888	0.912	1.226	-	1.226
Description: Laser Vision, a family of EO systems that significantly increases ID ranges. Provides the demonstration and evaluation data necessary to support decisions on future EO technologies supporting CID.					
FY 2010 Accomplishments: Efforts began to put EO polarization into a targeting pod as a low cost CID discriminator.					
FY 2011 Plans: Continuing efforts to put EO polarization into a targeting pod as a low cost CID discriminator.					
FY 2012 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2012 Air Force		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603742F: *Combat Identification Technology*	PROJECT 642597: *Noncooperative Identification Subsystems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Advanced Concepts: Will continue to focus on emerging technologies that could be installed into platforms like targeting pods and RPAs. ***FY 2012 OCO Plans:***					
Title: Siren ***Description:*** Provides the demonstration and evaluation data necessary to support laser vibrometry into a targeting pod as a low cost CID discriminator. ***FY 2010 Accomplishments:*** Continued efforts to put laser vibrometry capability into a targeting pod. ***FY 2011 Plans:*** Continue efforts to put laser vibrometry capability into a targeting pod. ***FY 2012 Base Plans:*** Will continue efforts to put laser vibrometry capability into a targeting pod. ***FY 2012 OCO Plans:***	1.300	1.208	2.553	-	2.553
Title: Radar Vision ***Description:*** The Radar Vision (RV) technology applies Aided Target Recognition (ATR) algorithms to Radar Imagery and Radar Signature returns which puts target ID labels on the radar imagery and tracks using a common database of target signatures. ***FY 2010 Accomplishments:*** RV increment 5 combined stationary and moving target identification efforts. Synthetic Aperture Radar (SAR) transitioned to F-35. ***FY 2011 Plans:*** RV increment 5 efforts continue. ***FY 2012 Base Plans:*** RV increment 5 efforts will complete. ***FY 2012 OCO Plans:***	9.993	11.315	6.857	-	6.857
Title: Hydra Vision	4.604	4.976	7.921	-	7.921

Exhibit R-2A, RDT&E Project Justification: PB 2012 Air Force		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603742F: *Combat Identification Technology*	PROJECT 642597: *Noncooperative Identification Subsystems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Description: Hydra Vision (Multi Sensor Enhanced ID; formerly Fusion Vision) a balanced (robust) amalgamation of sensor data from multiple sources to provide warfighters with higher confidence CID results on surface or air targets. ***FY 2010 Accomplishments:*** Air to air moved toward a laboratory demonstration and air to ground completed the studies of multiple sensor phenomenologies for high confidence CID. ***FY 2011 Plans:*** Air to air efforts demonstrate feature fusion as the air to ground efforts proceed toward demonstration / development. ***FY 2012 Base Plans:*** Air to air efforts will demonstrate feature fusion as the air to ground efforts will proceed toward demonstration / development. ***FY 2012 OCO Plans:***					
Title: Studies ***Description:*** Conduct CID-related studies/demos and conferences. ***FY 2010 Accomplishments:*** AFIT CID studies. Studies were conducted in alternative signature techniques for JSSD. ***FY 2011 Plans:*** Continue AFIT CID related projects. ***FY 2012 Base Plans:*** AFIT will continue to encourage CID related studies. ***FY 2012 OCO Plans:***	0.325	0.368	0.246	-	0.246
Title: X-Patch ***Description:*** X-Patch consists of software code refinement based on feedback from the X-Patch user community.	3.190	3.178	3.168	-	3.168

Exhibit R-2A, RDT&E Project Justification: PB 2012 Air Force		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603742F: *Combat Identification Technology*	PROJECT 642597: *Noncooperative Identification Subsystems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
FY 2010 Accomplishments: Continued X-Patch RDT&E sustainment. ***FY 2011 Plans:*** Continue X-Patch RDT&E sustainment. ***FY 2012 Base Plans:*** Sustainment will continue for X-Patch RDT&E. ***FY 2012 OCO Plans:***					
Title: Database Development ***Description:*** Establish and develop the Target Signature (multispectral) Database Development Program. ***FY 2010 Accomplishments:*** Completed incorporation of the analysis and database developed in prior years. ***FY 2011 Plans:*** ***FY 2012 Base Plans:*** ***FY 2012 OCO Plans:***	0.259	-	-	-	-
Title: Digital IFF Control Panel ***Description:*** This program element is developing a Digital IFF Control Panel (DCP) to support Mode 5 and ADS-B insertion programs into Air Force platforms with an ARINC 429 based avionics architecture. The DCP will provide a standard control panel for AF aircraft with built in capability for IFF support of ADS-B and beyond. ***FY 2010 Accomplishments:*** Developed the DCP in support of the Mode 5 TIP and ADS-B TIP programs ***FY 2011 Plans:*** ***FY 2012 Base Plans:*** ***FY 2012 OCO Plans:***	0.770	-	-	-	-
Title: JCTI-AoA	1.400	1.600	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2012 Air Force		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603742F: *Combat Identification Technology*	**PROJECT** 642597: *Noncooperative Identification Subsystems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Description: Joint Cooperative target Identification - Ground (JCTI-G) Analysis of Alternatives (AoA). This is an OSD AT&L directed program for the services to conduct an AoA for Fires of Dismounts (FoD) and Air to Ground (A-G). The Air Force has agreed to lead the A-G portion of the AoA. ***FY 2010 Accomplishments:*** Provided funds to ACC/A8S in support of the AF portion of the JCTI-G AoA. ***FY 2011 Plans:*** Provide funds to ACC/A8S in support of AF portion of the JCTI-G AoA. ***FY 2012 Base Plans:*** ***FY 2012 OCO Plans:***					
Title: ADS-B ***Description:*** Automatic Dependent Surveillance-Broadcast (ADS-B) TIP: This program element will fund preliminary RDT&E for integration of ADS-B architecture into the APX-119 Mark XIIA transponder. The ADS-B TIP will develop ADS-B "In" and "out" capability which leverages synergies between ADS-B and Mode 5 Level 2(M5L2) to achieve M5L2 "In" capability. The ADS-B TIP specifically addresses implementing air platforms. ***FY 2010 Accomplishments:*** ***FY 2011 Plans:*** ***FY 2012 Base Plans:*** ADS-B will be inserted into the APX-119 transponder as part of the ADS-B TIP Program. ***FY 2012 OCO Plans:***	-	-	14.434	-	14.434
Accomplishments/Planned Programs Subtotals	22.729	23.557	36.405	-	36.405

	FY 2010	FY 2011
Congressional Add: Fast Steering Mirror ***FY 2010 Accomplishments:*** Fast mirror technology was inserted into the Litening targeting pod. ***FY 2011 Plans:*** Finish the Fast Steering Mirror technology into the Northrop Litening pod.	1.590	-
Congressional Adds Subtotals	1.590	-

Exhibit R-2A, RDT&E Project Justification: PB 2012 Air Force		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603742F: *Combat Identification Technology*	PROJECT 642597: *Noncooperative Identification Subsystems*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
• Activity Not Provided: *Title Not Provided*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

D. Acquisition Strategy

Award multiple, competitive contract vehicles emphasizing off-the-shelf technology and maximizing the use of non-developmental items (NDIs).

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 2012 Air Force			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603742F: *Combat Identification Technology*	PROJECT 642597: *Noncooperative Identification Subsystems*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Radar Vision - Increment 5	C/CPFF	Raytheon Company:El Segundo, CA	27.059	3.442	Nov 2010	3.646	Nov 2011	-		3.646	Continuing	Continuing	TBD
Radar Vision - Denied Target	C/CPFF	Northrop Grumman:Linthicum Heights, MD	23.962	5.142	Nov 2010	5.827	Nov 2011	-		5.827	Continuing	Continuing	TBD
Laser Vision - LTIP	C/CPFF	Northrop Grumman:Rowling Meadows, IL	15.058	-		0.826	Nov 2011	-		0.826	Continuing	Continuing	TBD
Database Development	C/CPFF	SAIC:San Diego, CA	12.087	-		-		-		-	0.000	12.087	12.087
X-Patch	C/CPFF	SAIC:Mclean, VA	3.086	3.243	Nov 2010	3.133	Nov 2011	-		3.133	Continuing	Continuing	TBD
Hydra Vision - Air to Air	C/CPFF	General Dynamics:Beavercreek, OH	3.641	1.263	Dec 2010	0.830	Dec 2011	-		0.830	Continuing	Continuing	TBD
Compase Center - Evaluation	C/CPFF	Jacobs:Ft. Walton Beach, FL	5.937	0.570	Dec 2010	0.300	Dec 2011	-		0.300	Continuing	Continuing	TBD
SIREN & Litening Study	MIPR	AFRL/RYZ:Dayton, OH	2.424	1.208	Dec 2010	2.553	Dec 2011	-		2.553	Continuing	Continuing	TBD
MVDOG	MIPR	Sandia:Albuquerque, NM	4.467	1.790	Dec 2010	1.210	Dec 2011	-		1.210	Continuing	Continuing	TBD
Studies	MIPR	AFIT, NASIC:Dayton, OH	0.590	0.100	Dec 2010	0.100	Dec 2011	-		0.100	Continuing	Continuing	TBD
Hydra Vision	C/CPFF	Ball Aerospace:Boulder, CO	0.200	-		-		-		-	0.000	0.200	0.200
Hydra Vision - Air to Ground	C/CPFF	BAE Systems:Burlington, MA	0.350	-		-		-		-	0.000	0.350	0.350
Radar Vision	C/CPAF	McAulay Brown:Dayton, OH	0.209	-		-		-		-	0.000	0.209	0.209
Mode 5	C/CPFF	Raytheon:Baltimore, MD	2.066	0.300	Mar 2011	-		-		-	Continuing	Continuing	TBD
Automatic Dependent Surveillance-Broadcast (ADS-B)	TBD	TBD:TBD,	-	-		14.313	Dec 2011	-		14.313	Continuing	Continuing	TBD
		Subtotal	101.136	17.058		32.738		-		32.738			

Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Air Force		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603742F: *Combat Identification Technology*	PROJECT 642597: *Noncooperative Identification Subsystems*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SPO support	Various	ESC HSJJ:Hanscom AFB, MA	4.543	0.358	Oct 2010	0.350	Oct 2011	-		0.350	Continuing	Continuing	TBD
Air Force Research Laboratory	MIPR	AFRL:Dayton, OH	2.787	0.340	Oct 2010	0.340	Oct 2011	-		0.340	Continuing	Continuing	TBD
Robins AFB (X-Patch)	MIPR	402 MXW/ OBWB:Robins AFB, GA	0.400	0.400	Oct 2010	0.400	Oct 2011	-		0.400	Continuing	Continuing	0.000
		Subtotal	7.730	1.098		1.090		-		1.090			

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Radar Vision	MIPR	46th Test Wing:Eglin, FL	6.503	0.100	Jun 2011	0.100	Jun 2012	-		0.100	Continuing	Continuing	TBD
Test Organizations	TBD	TBD:TBD,	-	0.200	Jan 2011	0.200	Jan 2012	-		0.200	Continuing	Continuing	TBD
MSIC/AMRDEC/RTTC	MIPR	MSIC/AMRDEC/ RTTC:Redstone Arsenal, AL	2.066	0.300	Apr 2011	0.100	Apr 2012	-		0.100	Continuing	Continuing	TBD
		Subtotal	8.569	0.600		0.400		-		0.400			

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Office	Various	Jacobs, Odyssey, MITRE:Hanscom AFB, MA	15.135	2.042	Oct 2010	1.858	Sep 2011	-		1.858	Continuing	Continuing	TBD
Air Force Research Labratory	Various	SAIC:San Diego, CA	1.950	0.310	Dec 2010	0.319	Dec 2011	-		0.319	Continuing	Continuing	TBD
JCTI-AoA	MIPR	Booze Allen:MccLean, VA	1.400	2.449	Feb 2011	-		-		-	0.000	3.849	3.849
		Subtotal	18.485	4.801		2.177		-		2.177			

Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Air Force			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603742F: *Combat Identification Technology*	PROJECT 642597: *Noncooperative Identification Subsystems*	

	Total Prior Years Cost	FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	135.920	23.557		36.405		-		36.405			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2012 Air Force		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603742F: *Combat Identification Technology*	**PROJECT** 642597: *Noncooperative Identification Subsystems*

Exhibit R-4A, RDT&E Schedule Details: PB 2012 Air Force		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603742F: *Combat Identification Technology*	**PROJECT** 642597: *Noncooperative Identification Subsystems*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
LASER VISION - Combat Mode / EO Polarization	1	2010	1	2012
LASER VISION - Advanced Concepts / Siren	1	2010	2	2016
LASER VISION - Fast Mirror Technology Insertion	2	2011	4	2012
RADAR VISION - Radar Vision Spiral 5	1	2010	1	2013
RADAR VISION - Denied Target Development	3	2010	3	2013
RADAR VISION - Ku-Band Demonstration	3	2010	3	2012
RADAR VISION - Sterling Rose (formally Black Rose)	3	2010	3	2011
Hydra VISION - Spiral 1 - Air-toAir	1	2010	3	2015
Hydra VISION - Spiral 2 - Air-to-Ground	1	2010	4	2015
Hydra VISION - MVDOG	4	2010	3	2012
Database Development	1	2010	1	2011
X-Patch Development	1	2011	4	2016

Exhibit R-2A, RDT&E Project Justification: PB 2012 Air Force			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603742F: *Combat Identification Technology*	PROJECT 642599: *Cooperative Identification Techniques*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
642599: *Cooperative Identification Techniques*	3.531	2.615	2.091	-	2.091	1.847	1.874	1.899	1.932	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Cooperative CID employs technologies required to rapidly identify friendly platforms. The program develops, integrates and evaluates technologies that provide AF platforms with a means of positively identifying an air or ground platform as a friendly, via active or passive cooperative ID capabilities. Development funded by this program element ensures availability of a Mode 5 upgrade path for implementing ground and air platforms across the Air Force fleet. Within the air-to-air domain, programs funded to meet this intent include: (1) Mode 5 Technology Insertion Program (TIP): The program element funds preliminary RDT&E for Mark XIIA, the next generation Identification Friend or Foe (IFF) standard for the DoD and NATO. Mark XIIA represents a substantial enhancement to the Mark XII IFF system. It is expected to achieve joint initial operational capability in 2014. The "A" denotes the addition of Mode 5 (an encrypted challenge-and-reply mode) to the other Mark XII system modes (Modes 1, 2, 3/A, C, S, and 4). The Mode 5 secure IFF program is a DoD-wide, Navy-led development and acquisition program. The Mode 5 TIP specifically addresses implementing air platforms. (2) Automatic Dependent Surveillance-Broadcast (ADS-B) TIP: This program element will fund preliminary RDT&E for integration of ADS-B architecture into the APX-119 Mark XIIA transponder. The ADS-B TIP will develop ADS-B "In" and "out" capability which leverages synergies between ADS-B and Mode 5 Level 2 (M5L2) to achieve M5L2 "In" capability. The ADS-B TIP specifically addresses implementing air platforms. (3) Digital IFF Control Panel: This program element is developing a Digital IFF Control Panel (DCP) to support Mode 5 and ADS-B insertion programs into Air Force platforms with an ARINC 429 based avionics architecture. The DCP will provide a standard control panel for AF aircraft with built in capability for IFF support of ADS-B and beyond.

Joint Cooperative Target Identification – Ground (JCTI-G) Analysis of Alternatives (AoA). This is an OSD AT&L directed program for the services. The Army will lead the Fires on Dismount (FoD) portion and the USAF will lead the Air to Ground (A-G) portion. The Army and USAF are negotiating an MOA for the stand up of a Joint Program Office (JPO).

Within the air-to-ground domain, development funded by this program element ensures development, integration, test and evaluation of friendly identification systems focused on reducing air-to-ground fratricide. Programs funded to meet this intent include: (1) Radio Based Combat Identification: An active challenge reply system leveraging Single Channel Ground and Airborne Radio System (SINCGARS) capable ground and aircraft targeting pod mounted radios for air-to-ground friendly identification and (2) Laser Frequency Responsive Tape: A low cost, un- powered passive device to aid in the detection of friendly ground forces via airborne electro-optical sensors.

This program element also funds the Air Traffic Control Radar Beacon Systems Identification Friend or Foe Mark XII/XIIA System (AIMS) Program Office. The DoD International AIMS PO has system level interoperability management responsibilities for the present Mark XII system, development and integration of Mark XIIA (Mode 5) and transition to Mark XIIA Mode S systems.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Air Force		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603742F: *Combat Identification Technology*	PROJECT 642599: *Cooperative Identification Techniques*

This program is in Budget Activity 4, Advanced Component Development and Prototypes (ACD&P) because efforts are necessary to evaluate integrated technologies, representative modes or prototype systems in a high fidelity and realistic operating environment.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: Mode 5 Technology Insertion Program ***Description:*** Continue the Mode 5 upgrade to the APX-119 transponder, the APX-114 interrogator, and the APX-113 Combined Interrogator/Transponder (CIT). ***FY 2010 Accomplishments:*** Completed the testing and certification of the APX-119 and APX-114 and continued with aircraft integration support. ***FY 2011 Plans:*** Complete the testing and certification of the APX-113 and continue with aircraft integration support. ***FY 2012 Base Plans:*** ***FY 2012 OCO Plans:***	2.101	0.733	-	-	-
Title: Radio Based Combat Idetification ***Description:*** Radio Based Combat Identification (RBCI) Technology Insertion Program (TIP): An active challenge reply system leveraging Single Channel Ground and Airborne Radio System (SINCGARS) capable ground and aircraft targeting pod mounted radios for air-to-ground friendly identification. ***FY 2010 Accomplishments:*** RBCI flew in the Northrop Grumman Litening pod in BoldQuest 09 ***FY 2011 Plans:*** RBCI is inserted in the Lockheed Martin sniper pod as a demonstration of RBCI in the predominent USAF targeting pod. ***FY 2012 Base Plans:*** ***FY 2012 OCO Plans:***	0.100	0.100	-	-	-
Title: AIMS Program Office ***Description:*** Fund Air Traffic Control Radar Beacon Systems Identification Friend or Foe Mark XIIA System (AIMS)Program Office. The DoD International AIMS PO has system level interoperability management	1.330	1.782	2.091	-	2.091

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
responsibilities for the present Mark XII system, development and integration of Mark XIIA (Mode 5) and transition to Mark XIIA Mode S systems. ***FY 2010 Accomplishments:*** Continued to fund AIMS for interoperability testing, FAA liason, and support of Mode 4 / Mode 5 equipment. ***FY 2011 Plans:*** Continue to fund AIMS for interoperability testing, FAA liason, and support of Mode 4 / Mode 5 equipment. ***FY 2012 Base Plans:*** Will continue to fund AIMS for interoperability testing, FAA liason, and support of Mode 4 / Mode 5 equipment. ***FY 2012 OCO Plans:***					
Accomplishments/Planned Programs Subtotals	3.531	2.615	2.091	-	2.091

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
• Activity Not Provided: *Title Not Provided*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

D. Acquisition Strategy

Award multiple, competitive contract vehicles emphasizing off-the-shelf technology and maximizing the use of non-developmental items (NDIs).

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 2012 Air Force			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603742F: *Combat Identification Technology*	PROJECT 642599: *Cooperative Identification Techniques*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Mode 5	C/CPFF	Raytheon:Baltimore, MD	19.706	0.133	Dec 2010	-		-		-	Continuing	Continuing	TBD
Mode 5 Insertion Program	C/CPFF	BAE:Greenlawn, NY	10.956	0.700	Mar 2011	-		-		-	Continuing	Continuing	TBD
		Subtotal	30.662	0.833		-		-		-			

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	-		-		-		-	0.000	0.000	0.000

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	-		-		-		-	0.000	0.000	0.000

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering/Program Management (AIMS PO)AF 616	C/FFP	WRALC/ENT:Robins AFB, GA	3.390	1.782	Nov 2010	2.091	Nov 2011	-		2.091	Continuing	Continuing	TBD
		Subtotal	3.390	1.782		2.091		-		2.091			

	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	34.052	2.615		2.091		-		2.091			

Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Air Force			DATE: February 2011
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	Total Prior Years Cost	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2012 Air Force		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603742F: *Combat Identification Technology*	**PROJECT** 642599: *Cooperative Identification Techniques*

Exhibit R-4A, RDT&E Schedule Details: PB 2012 Air Force		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603742F: *Combat Identification Technology*	**PROJECT** 642599: *Cooperative Identification Techniques*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Mode 5 System Engineering and Program Support	1	2010	2	2014
Mode 5 TIP (APX-114 Design Development / AIMS Certification)	1	2010	3	2011
Mode 5 TIP (APX-119 Design Development / AIMS Certification)	1	2010	3	2011
Mode 5 TIP (APX-113 Design Development / AIMS Certification	1	2011	4	2012
ADS-B TIP (APX-119 Design Development)	3	2011	4	2013
Digital IFF Control Panel	4	2010	1	2012
A-G Cooperative ID (RBCI 1 Integration/Demo)	1	2010	2	2010
A-G Cooperative ID (RBCI 2 Integration/Demo)	2	2011	1	2012
AIMS Program Office Support	1	2010	4	2016