Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force											Date: May 2017	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603742F / *Combat Identification Technology*							
COST ($ in Millions)	**Prior Years**	**FY 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**Cost To Complete**	**Total Cost**
Total Program Element	-	21.025	24.418	24.397	0.000	24.397	23.655	24.095	24.513	25.014	Continuing	Continuing
642597: *Noncooperative Identification Subsystems*	-	19.194	22.506	22.442	0.000	22.442	21.669	22.072	22.455	22.914	Continuing	Continuing
642599: *Cooperative Identification Techniques*	-	1.831	1.912	1.955	0.000	1.955	1.986	2.023	2.058	2.100	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 Engineering and Manufacturing Development (EMD). The Joint Capability Document (JCD) for CID BFT (Blue Force Tracking), 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 EMD decisions, the program element funds design studies, engineering analysis, and other efforts associated with demonstration of prototype CID related technologies and subsystems 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; (2) Hydra Vision, a balanced (robust) amalgamation of sensor data from multiple sources to provide warfighters with higher confidence CID results on surface or air targets potentially including fusion with intelligence sources, identification of non-traditional targets, fusion to counter camouflage, concealment and deception (CCD), and multi-phenomenology features for sustainable databases; (3) Compact AiTR (Aided Target Recognition) and Sustainable Environments (CASE), a CID approach that focuses on tailoring algorithms to utilize smaller, more efficient databases that are faster and less expensive to generate and maintain; (4) Passive RF ID Environment (PRIDE), a program to develop passive RF target ID capability for denied access environment utilizing passive RF and EW information with potential non-traditional ISR capabilities; (5) Radio ID (RID) will develop methods for utilizing advances in digital radio technologies such as software defined radios, to provide low cost ID solutions to enhance Combat ID, improve aircrew situational awareness and assist in fratricide prevention with military and civil air platforms, potentially fusing non-cooperative techniques and cooperative technologies; and (6) Enhanced Combat ID (ECID), a program under Studies to develop a robust ability to quantitatively evaluate promising CID technologies using enhanced modeling and simulation (M&S) capabilities.

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

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*

program element ensures availability of Automatic Dependent Surveillance - Broadcast (ADS-B) as well as Mode 5 IFF (Identification Friend or Foe) upgrade path for implementing ground and air platforms across the Air Force fleet. Activities also include studies and analysis to support both current program planning and execution and future program planning.

Fund Air Traffic Control Radar Beacon Systems Identification Friend or Foe Mark XIIA System (AIMS)Program Office test engineers. The DoD International AIMS PO has system level interoperability testing and certification responsibilities for the present Mark XII system, development and integration of Mark XIIA (Mode 5) and transition to Mark XIIA Mode S systems. AIMS PO will continue to test and certify IFF equipment for the services now as long as IFF is used for combat identification.

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. Program Change Summary ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	21.790	24.418	24.327	0.000	24.327
Current President's Budget	21.025	24.418	24.397	0.000	24.397
Total Adjustments	-0.765	0.000	0.070	0.000	0.070
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.765	0.000			
• Other Adjustments	0.000	0.000	0.070	0.000	0.070

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force			Date: May 2017
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603742F / *Combat Identification Technology*	Project (Number/Name) 642597 / *Noncooperative Identification Subsystems*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
642597: *Noncooperative Identification Subsystems*	-	19.194	22.506	22.442	0.000	22.442	21.669	22.072	22.455	22.914	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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; (2) Hydra Vision, a balanced (robust) amalgamation of sensor data from multiple sources to provide warfighters with higher confidence CID results on surface or air targets potentially including fusion with intelligence sources, identification of non-traditional targets, fusion to counter camouflage, concealment and deception (CCD), and multi-phenomenology features for sustainable databases; (3) Compact AiTR (Aided Target Recognition) and Sustainable Environments (CASE), a CID approach that focuses on tailoring algorithms to utilize smaller, more efficient databases that are faster and less expensive to generate and maintain; (4) Passive RF ID Environment (PRIDE), a program to develop passive RF target ID capability for denied access environment utilizing passive RF and EW information with potential non-traditional ISR capabilities; (5) Radio ID (RID) will develop methods for utilizing advances in digital radio technologies such as software defined radios, to provide low cost ID solutions to enhance Combat ID, improve aircrew situational awareness and assist in fratricide prevention with military and civil air platforms, potentially fusing non-cooperative techniques and cooperative technologies; and (6) Enhanced Combat ID (ECID), a program under Studies to develop a robust ability to quantitatively evaluate promising CID technologies using enhanced modeling and simulation (M&S) capabilities.

Activities also include studies and analysis to support both current program planning and execution and future program planning.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Laser Vision/SIREN	4.615	2.552	0.000	-	0.000
Description: Design, fabricate, and evaluate a tactical range laser vibrometry sensor in a targeting pod. Leverage ability of active electro-optic sensors to sense micro-displacements of operating machinery in order to measure the resulting frequency spectrum. Assess utility for air-to-ground combat identification. The Vibrometry Advanced Mode Processor (VAMP) program is research into advanced algorithms for processing data provided by vibrometry sensors in order to develop and demonstrate prototype pilot Aided Target Recognition software.					
FY 2016 Accomplishments: - Targeting pod testing was conducted at the Northrop Grumman facility in 3rd quarter of 2016 - Targeting pod system tower testing was conducted at Wright Patterson AFB in 4th quarter 2016.					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*	**Project (Number/Name)** 642597 / *Noncooperative Identification Subsystems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
- SIREN sensor flight test demonstrated the vibrometry sensing technology in a surrogate targeting Pod in 4th quarter 2016. - Laser vibrometry will provide a valuable target recognition capability for determining ground targets engine type, with potential to counter enemy Camouflage, Concealment and Deception (CC&D) techniques as well as a valuable battle damage assessment tool. - SIREN will provide the warfighter with a critical complement to image based ID tools and has the potential for air target ID as well as ground target ID. ***FY 2017 Plans:*** - A demonstration will be accomplished on a modified LITENING Pod flying on an test F-16 N/A ***FY 2018 Base Plans:*** N/A					
Title: Laser Vision/VAMP	0.611	1.811	3.000	0.000	3.000
Description: Design, fabricate, and evaluate a tactical range laser vibrometry sensor in a targeting pod. Leverage ability of active electro-optic sensors to sense micro-displacements of operating machinery in order to measure the resulting frequency spectrum. Assess utility for air-to-ground combat identification. The VAMP program exploits research into advanced algorithms for processing data provided by vibrometry sensors in order to develop and demonstrate prototype pilot Aided Target Recognition (AiTR) software. ***FY 2016 Accomplishments:*** - Explored surrogate target measurement capabilities for ground testing and affordable sustainment ***FY 2017 Plans:*** - Kickoff a new VAMP algorithm development contract - Initiate ID algorithm development with relevant data from SIREN sensor ***FY 2018 Base Plans:*** - ID algorithm development will continue with relevant data from SIREN sensor - Surrogate target measurement capabilities will be developed for ground testing and affordable sustainment - An AiTR software algorithm will be integrated into the SIREN surrogate targeting pod					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*	**Project (Number/Name)** 642597 / *Noncooperative Identification Subsystems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
- An AiTR lab demo will be accomplished with the SIREN sensor ***FY 2018 OCO Plans:*** N/A					
Title: Laser Vision/3-D Ladar ***Description:*** Laser Vision, a family of electro-optical (EO) systems that significantly increase ID ranges. Provide the demonstration and evaluation data necessary to support decisions on future EO technologies supporting CID, including 3-D (3-dimensional) imaging laser radar (Ladar) and exploration of advanced concepts. The 3-D ladar technology provides a display of a 3-D EO image to the pilot for high confidence combat identification and is a potential for the next generation targeting pods for the USAF. ***FY 2016 Accomplishments:*** -3-Dimensional Targeting Operations (3DTO) Performance Model Completed detailing expected performance of sensor package. -Successful Diagnostic/Retrieval Systems, Inc (DRS) Phase II Focal Plane Array (FPA) field test collection completed. -Initial Signal Correction Algorithms designed and developed. -Image Registration Algorithms Designed and Implemented (2D Enhancement). -Collaboration with Human Performance Wing (HPW) re-established, (Commander's Research and Development Fund) CRDF planned for future. -Pod Integration Contract Awarded to Northrop Grumman Engineering Systems (NGES) with DRS as a subcontractor (Defense Microelectronics Agency (DMEA) contract vehicle). -DRS determined that Read-out Integrated Circuit (ROIC) requires a re-spin to solve impedance issues. ***FY 2017 Plans:*** -DRS will complete ROIC re-spin and accomplish testing and analysis of Phase IIIB ROICs and FPAs. -Additional field testing at NGES, DRS, and/or Wright-Patterson Air Force Base (WPAFB) will be accomplished to further characterize DRS FPAs. -Additional field testing lab system acquired with integrated Phase III FPA for lab characterization and short range (1-3km) field test analysis. -Ladar Performance Model will add 3DTO specific metrics (Range Uncertainty, etc.) -3DTO Performance Model Trade study will be completed. -'FINAL' versions of Signal Correction Algorithms will be designed and developed.	1.711	2.311	2.000	0.000	2.000

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*	**Project (Number/Name)** 642597 / *Noncooperative Identification Subsystems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
-Physics-based 3DTO Simulation model will be completed enabling generation of simulated imagery with full atmospherics and FPA physics included. -3DTO Simulation model can/will be used to analyze air-to-air engagements, occluded target analysis, targets-in-hide, and other scenarios. -3DTO Signal Analysis Toolkit Version 1.0 will be delivered enabling quick-look analysis capabilities for 3DTO sensor data. -Collaboration with HPW (CRDF) will complete human performance experiment as well as data analysis capabilities ***FY 2018 Base Plans:*** -DRS will deliver Flight Receiver Package (Integrated Dewar-Cooler Assembly) with re-spun ROICs and final FPAs. -Pod Integration contract will conclude with Field/Tower test at NGES or WPAFB with fully integrated 3DTO Flight Receiver package. -Pod Integration Flight Test contract will be awarded (DMEA Phase II). -Possible Pod-Integration ground test will be accomplished for pre-flight check out. ***FY 2018 OCO Plans:*** N/A					
Title: Hydra Vision/Air to Air ***Description:*** Hydra Vision (Multi-Sensor Enhanced ID) is a balanced (robust) amalgamation of sensor data from multiple sources to provide warfighters with higher confidence CID results on surface or air targets. There are two main thrusts occurring simultaneously, Air-to-Air and Air-to-Ground. ***FY 2016 Accomplishments:*** - Operational sized database was developed utilizing new modeling methods which are significantly easier to update and maintain - Performed data collection events to gather all three primary features simultaneously - Continued to refine fusion algorithms to maximize performance ***FY 2017 Plans:*** - Will perform a Technology Readiness Level (TRL) 5 Demonstration of newly developed algorithms showing feasibility and expected performance	4.218	5.067	2.000	0.000	2.000

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*	**Project (Number/Name)** 642597 / *Noncooperative Identification Subsystems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
- Integrate next generation air target identification algorithms onto 5th generation fighter radar and upgraded 4th generation fighter radars in preparation for TRL 6 Demonstrations - Maintain and refine target database as new information becomes available ***FY 2018 Base Plans:*** -Will investigate other phenomenology (such as laser radar and Infra-Red Search and Track (IRST))as feature fusion to enhance target identification confidence and accuracy. ***FY 2018 OCO Plans:*** N/A					
Title: Hydra Vision/Air to Ground ***Description:*** Hydra Vision (Multi-Sensor Enhanced ID) is a family of balanced (robust) amalgamation of sensor data from multiple sources to provide warfighters with higher confidence CID results on surface or air targets. ***FY 2016 Accomplishments:*** - Finalized plans for an operationally realistic capability demonstration on an MQ-9 (Reaper) which entailed integrating the Air to Ground system into the Multi-Intelligence Smart Processor (MISP) system. - Conducted plans for the operational demo. ***FY 2017 Plans:*** - Complete integration and fielding to an Air National Guard (ANG) or Air Force Special Operations Command (AFSOC) site for testing and demonstration. - Conduct an evaluation of system and algorithm performance. This will benefit both Air Combat Command (ACC) and AFSOC MQ-9's assuring more effective close in ID capabilities. ***FY 2018 Base Plans:*** - Current Air to Ground efforts will be completed in 2017. ***FY 2018 OCO Plans:*** N/A	3.211	0.667	0.000	0.000	0.000
Title: Compact AiTR (Aided Target Recognition) and Sustainable Environment (CASE) ***Description:*** CASE is a family of efforts to address efficiency and sustainability issues associated with the development, operation and maintenance of non-cooperative AiTR technology. Develop sustainable multiphenomenology AiTR based on low fidelity, compact, and inexpensive database technology.	3.148	4.287	4.000	0.000	4.000

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*	**Project (Number/Name)** 642597 / *Noncooperative Identification Subsystems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
FY 2016 Accomplishments: - Finalized development of a rapid target computer aided design (CAD) model build process and collected metrics on build time, accuracy, cost and AiTR performance impact. - Developed a rapid Synthetic Aperture Radar (SAR) signature predictor for use with SAR AiTRs. - Established a lab testbed architecture for full scene SAR processing and ability to evaluate multiple AiTR metrics. Utilized the testbed to demonstrate one metric on two 6-target sets using three model fidelity levels to evaluate identification, cost and sustainability metrics. - Adapted the Laser Radar (LiDAR) AiTR algorithm to the selected 3-D ladar sensor and enhanced the simulation to provide synthetic signatures for testing and analysis. Developed signal processing techniques to improve signature quality. - Completed a 6-target LiDAR AiTR lab demonstrations at a variety of slant ranges and noise levels. Assessed cost and performance metrics. - Finalized the approach for follow-on flight test demonstrations of CASE technologies. ***FY 2017 Plans:*** - Complete implementation of the SAR AiTR testbed incorporating multiple compact AiTR algorithms. - Conduct a SAR and LiDAR AiTR 24-target set Lab Demonstration. (~Jan 2017) - Complete preparation of the compact SAR and Ladar AiTR for real time flight testing. - Initiate flight testing planning and conduct risk reduction tests. ***FY 2018 Base Plans:*** - Will complete a real time flight demonstration of a compact SAR AiTR algorithm and evaluate performance, cost and sustainability metrics. - Will investigate feasibility of addressing High Resolution Radar (HRR) AiTR sustainment issues. ***FY 2018 OCO Plans:*** N/A					
Title: Passive RF ID Environment (PRIDE) ***Description:*** Develop passive RF target ID capability for denied access environment utilizing passive RF and EW information with potential non-traditional ISR capabilities. ***FY 2016 Accomplishments:***	1.330	3.611	7.578	0.000	7.578

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*	**Project (Number/Name)** 642597 / *Noncooperative Identification Subsystems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
- Explored concepts for RF-based CID to include bi-static/multi-static, passive incorporation of electronic warfare techniques, and multi-mode applications - The proposal evaluations were accomplished and it was determined that three Contracts were to be awarded - Contracts were awarded in the 4th Quarter and work commenced ***FY 2017 Plans:*** - PRIDE will assess the feasibility of a passive radar based ID capability - This technology development and demonstration is critical for strike fighter fleet to operate in the Anti-Access/ Area Denial environment ***FY 2018 Base Plans:*** - PRIDE will develop a passive radar based ID capability and will assess integration for the strike fighter fleet - The designs will be finalized enabling integration onto platform relevant hardware ***FY 2018 OCO Plans:*** N/A					
Title: Radio ID (RID) ***Description:*** RID will develop technologies to integrate radio based cooperative technologies with non-cooperative technologies into the cockpit. The benefits will be increased confidence target ID and situational awareness as well as reduced fratricides. RID will start in FY17. ***FY 2016 Accomplishments:*** N/A ***FY 2017 Plans:*** - Execute Broad Area Announcement for Radio ID - Receive and review Requests For Proposal; select 2-3 initial vendors for RID Phase 1 development activities - Generate contract actions (for awardees) to execute RID Phase I activities - Plan and execute RID project kick-off meeting and periodic Technical Interchange Forums ***FY 2018 Base Plans:*** - Finalize RID Phase 1 development efforts - Plan and execute RID Critical Design Review and Technical Interchange Forums - Plan and execute RID Initial Lab Demonstration - Vendors will submit demonstration data and final report to AFRL	0.000	1.200	2.664	0.000	2.664

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*	**Project (Number/Name)** 642597 / *Noncooperative Identification Subsystems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
- AFRL will down-select to 1-2 vendors for RID Phase II development and demonstration activities ***FY 2018 OCO Plans:*** N/A					
Title: Studies ***Description:*** Conduct CID-related studies/demos. ***FY 2016 Accomplishments:*** - Continue study projects leading to new concepts for non-cooperative and cooperative CID efforts. - ECIDS M&S tools were used to evaluate the effectiveness of results for tactical aircraft employing combined non-cooperative and cooperative CID systems against tactical aircraft employing with only non-cooperative CID systems. ***FY 2017 Plans:*** - Study projects will be continued leading to new concepts for non-cooperative and cooperative CID efforts. - Research and evaluate new ECID M&S tools to enable enhanced decision making capability to support CID investments. - Continue ECID study projects to evaluate feasibility of new concepts for non-cooperative and cooperative CID efforts. ***FY 2018 Base Plans:*** - Study projects will be continued leading to new concepts for non-cooperative and cooperative CID efforts. - Will initiate ECID tool set integration across CID organizations for effective decision making. - Will continue ECID study projects to evaluate feasibility of new concepts for non-cooperative and cooperative CID efforts. ***FY 2018 OCO Plans:*** N/A	0.350	1.000	1.200	0.000	1.200
Accomplishments/Planned Programs Subtotals	19.194	22.506	22.442	0.000	22.442

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*	**Project (Number/Name)** 642597 / *Noncooperative Identification Subsystems*

D. Acquisition Strategy

Combat Identification develops technologies for exploitation by the USAF and other services.
Award multiple, competitive contract vehicles emphasizing off-the-shelf technology and maximizing the use of non-developmental items (NDIs).
Management develops a technology to a point it can be demonstrated in a relative combat environment.

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: FY 2018 Air Force			Date: May 2017
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*	**Project (Number/Name)** 642597 / *Noncooperative Identification Subsystems*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hydra Vision (Air-to-Air) - L	C/CPFF	Leidos : Reston, VA	-	1.400	Feb 2016	0.750	Feb 2017	0.750	Oct 2017	0.000		0.750	Continuing	Continuing	-
Hydra Vision (Air-to-Air) - N	C/CPFF	Northrop Grumman : Linthicum Heights, MD	-	1.514	Oct 2015	1.500	Oct 2016	0.275	Oct 2017	0.000		0.275	Continuing	Continuing	-
Hydra Vision (Air-to-Air) - R	C/CPFF	Raytheon Company : El Segundo, CA	-	1.513	Oct 2015	2.000	Oct 2016	0.275	Oct 2017	0.000		0.275	Continuing	Continuing	-
SIREN	C/CPFF	Northrop Grumman : Rowling Meadows, IL	-	3.610	Oct 2015	1.000	Oct 2016	0.000		0.000		0.000	0.000	4.610	-
VAMP - EO X DWARVES	C/CPFF	Etegent : Cincinnati, OH	-	0.294	Oct 2015	1.587	Dec 2016	2.455	Nov 2017	0.000		2.455	Continuing	Continuing	-
3-D Ladar	C/CPFF	Northrop Grumman : Rolling Meadows, IL	-	2.100	Aug 2016	2.200	Nov 2016	1.550	Dec 2017	0.000		1.550	Continuing	Continuing	-
Hydra Vision, Target Recognition & Tracking Technology/CASE	MIPR	Sandia : Albuquerque, NM	-	0.600	Jan 2016	0.250	Dec 2016	0.250	Mar 2018	0.000		0.250	Continuing	Continuing	-
Studies - ECID	MIPR	Booz Allen Hamilton : McLean, VA	-	0.688	Oct 2015	0.800	Dec 2016	1.000	Dec 2017	0.000		1.000	Continuing	Continuing	-
Studies - Decision making for an Integrated CID Environment (DICE) - SBIR Phase III	C/CPFF	Frontier Technologies, Inc : Dayton, OH	-	0.200	Sep 2016	0.200	Oct 2016	0.200	Jan 2018	0.000		0.200	Continuing	Continuing	-
Hydra Vision - Air to Ground	C/CPFF	BAE Systems : Burlington, MA	-	0.600	Oct 2015	0.000		0.000		0.000		0.000	0.000	0.600	-
Hydra Vision- Ops Demo	C/CPFF	General Atomics : San Diego, CA	-	1.300	Oct 2015	0.500	Dec 2016	0.000		0.000		0.000	0.000	1.800	-
Hydra Vision - Compact AiTR and Sustainable Environment Reliable AiTR Features	C/CPFF	Matrix Research & Engineering : Dayton, OH	-	0.125	Dec 2015	0.250	Oct 2016	0.250	Oct 2017	0.000		0.250	Continuing	Continuing	-
Hydra Vision - Compact AiTR and Sustainable Environment Analysis - B	C/CPFF	BAE Systems : Burlington, MA	-	0.150	Nov 2015	0.250	Oct 2016	0.250	Oct 2017	0.000		0.250	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*	**Project (Number/Name)** 642597 / *Noncooperative Identification Subsystems*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hydra Vision - Compact AiTR and Sustainable Environment Analysis - L	C/CPFF	Leidos : Mclean, VA	-	1.338	Oct 2015	1.870	Oct 2016	1.495	Nov 2017	0.000		1.495	Continuing	Continuing	-
Hydra Vision - Compact AiTR and Sustainable Environment Analysis - R	C/CPFF	Raytheon : El Segundo, CA	-	1.319	Dec 2015	1.870	Dec 2016	1.495	Nov 2017	0.000		1.495	Continuing	Continuing	-
Passive Radar Identification Environment (PRIDE) - L	C/CPFF	Leidos : Mclean, VA	-	0.506	Sep 2016	1.894	Dec 2016	2.891	Jan 2018	0.000		2.891	Continuing	Continuing	-
Passive Radar Identification Environment (PRIDE) -STR	C/CPFF	Systems and Technology Research : Woburn, MA	-	0.506	Sep 2016	1.639	Dec 2016	2.381	Jan 2018	0.000		2.381	Continuing	Continuing	-
Passive Radar Identification Environment (PRIDE) - IAI	C/CPFF	Integrated Applications Inc : Chantilly, VA	-	0.506	Sep 2016	1.621	Dec 2016	2.700	Jan 2018	0.000		2.700	Continuing	Continuing	-
Radio Identification (RID)	C/TBD	TBD : TBD	-	0.000		1.200	Aug 2017	2.200	Feb 2018	0.000		2.200	Continuing	Continuing	-
Air Target IR Discrimination (ATID)	C/CPFF	TBD : TBD	-	0.000		0.000		1.200	Aug 2018	0.000		1.200	Continuing	Continuing	-
		Subtotal	-	18.269		21.381		21.617		0.000		21.617	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering Support	MIPR	MITRE : Rome, NY	-	0.025	Mar 2016	0.025	Mar 2017	0.025	Mar 2018	0.000		0.025	Continuing	Continuing	-
		Subtotal	-	0.025		0.025		0.025		0.000		0.025	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force			Date: May 2017
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*	**Project (Number/Name)** 642597 / *Noncooperative Identification Subsystems*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Air-to-Air Hydra Vision Flight Test	MIPR	46th Test Wing : Eglin AFB, FL	-	0.350	Jan 2016	0.500	Feb 2016	0.000		0.000		0.000	Continuing	Continuing	-
		Subtotal	-	0.350		0.500		0.000		0.000		0.000	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AFRL PMA	MIPR	GSA : Denver, CO	-	0.550	Oct 2015	0.600	Nov 2016	0.800	Mar 2018	0.000		0.800	Continuing	Continuing	-
		Subtotal	-	0.550		0.600		0.800		0.000		0.800	-	-	-

	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	19.194		22.506		22.442		0.000		22.442	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*	**Project (Number/Name)** 642597 / *Noncooperative Identification Subsystems*

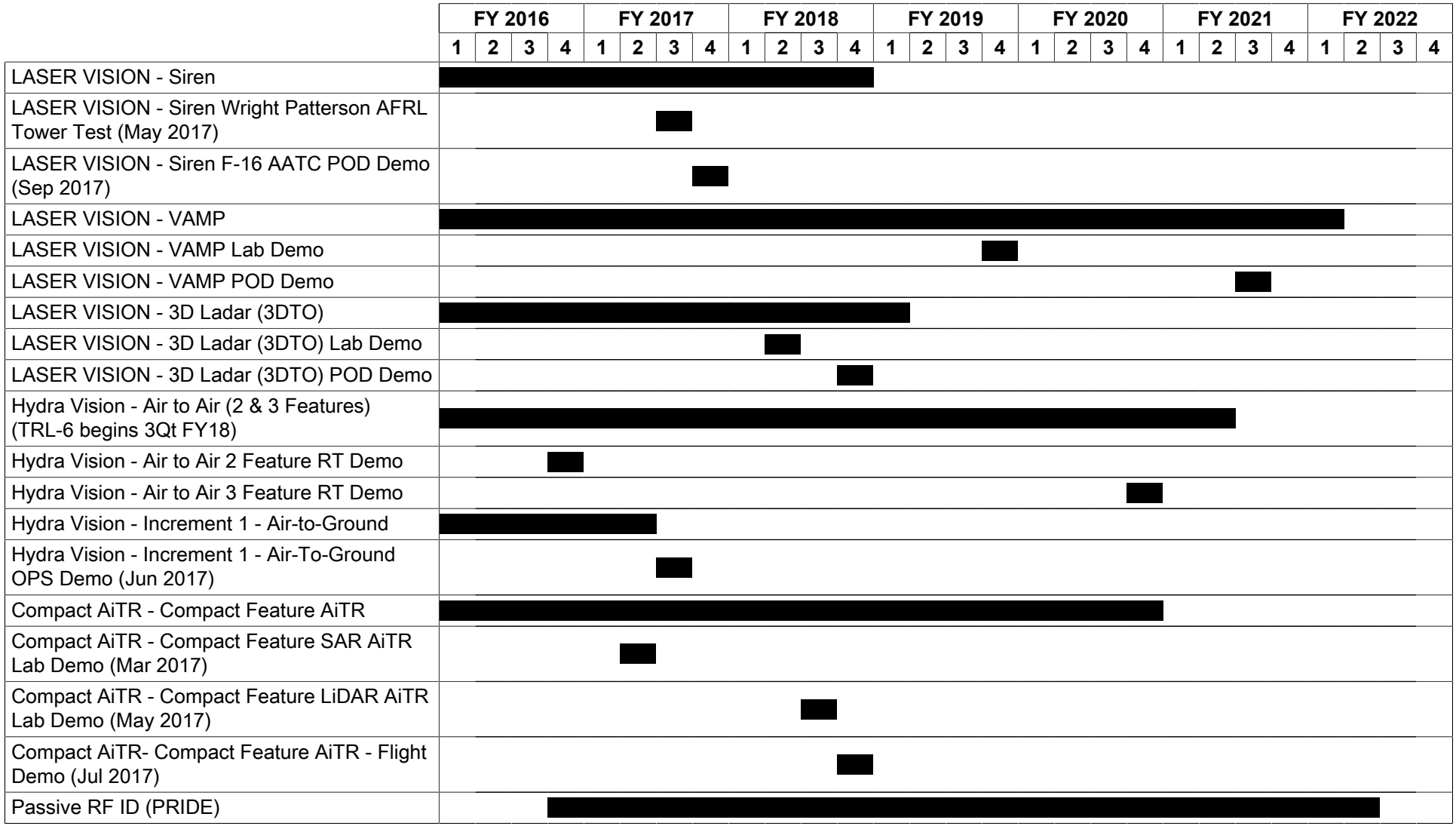

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*	**Project (Number/Name)** 642597 / *Noncooperative Identification Subsystems*

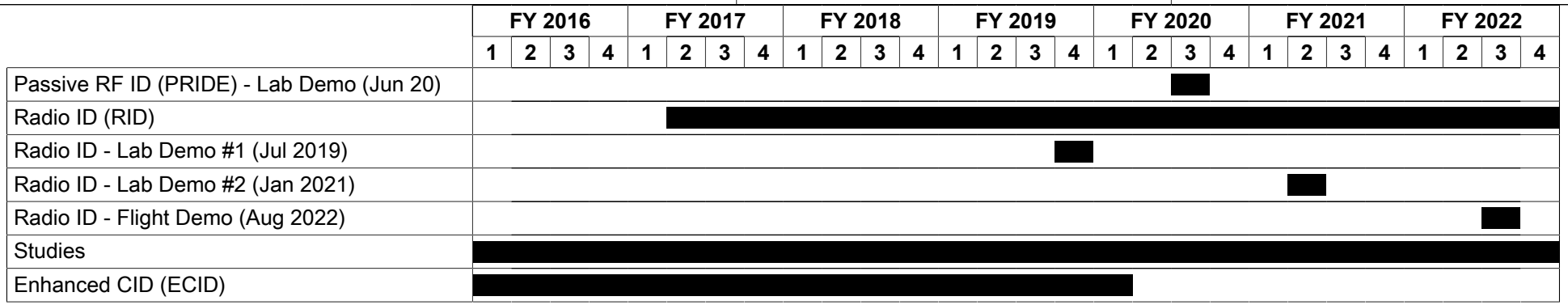

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*	**Project (Number/Name)** 642597 / *Noncooperative Identification Subsystems*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
LASER VISION - Siren	1	2016	4	2018
LASER VISION - Siren Wright Patterson AFRL Tower Test (May 2017)	3	2017	3	2017
LASER VISION - Siren F-16 AATC POD Demo (Sep 2017)	4	2017	4	2017
LASER VISION - VAMP	1	2016	1	2022
LASER VISION - VAMP Lab Demo	4	2019	4	2019
LASER VISION - VAMP POD Demo	3	2021	3	2021
LASER VISION - 3D Ladar (3DTO)	1	2016	1	2019
LASER VISION - 3D Ladar (3DTO) Lab Demo	2	2018	2	2018
LASER VISION - 3D Ladar (3DTO) POD Demo	4	2018	4	2018
Hydra Vision - Air to Air (2 & 3 Features) (TRL-6 begins 3Qt FY18)	1	2016	2	2021
Hydra Vision - Air to Air 2 Feature RT Demo	4	2016	4	2016
Hydra Vision - Air to Air 3 Feature RT Demo	4	2020	4	2020
Hydra Vision - Increment 1 - Air-to-Ground	1	2016	2	2017
Hydra Vision - Increment 1 - Air-To-Ground OPS Demo (Jun 2017)	3	2017	3	2017
Compact AiTR - Compact Feature AiTR	1	2016	4	2020
Compact AiTR - Compact Feature SAR AiTR Lab Demo (Mar 2017)	2	2017	2	2017
Compact AiTR - Compact Feature LiDAR AiTR Lab Demo (May 2017)	3	2018	3	2018
Compact AiTR- Compact Feature AiTR - Flight Demo (Jul 2017)	4	2018	4	2018
Passive RF ID (PRIDE)	4	2016	2	2022
Passive RF ID (PRIDE) - Lab Demo (Jun 20)	3	2020	3	2020
Radio ID (RID)	2	2017	4	2022
Radio ID - Lab Demo #1 (Jul 2019)	4	2019	4	2019

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*	**Project (Number/Name)** 642597 / *Noncooperative Identification Subsystems*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Radio ID - Lab Demo #2 (Jan 2021)	2	2021	2	2021
Radio ID - Flight Demo (Aug 2022)	3	2022	3	2022
Studies	1	2016	4	2022
Enhanced CID (ECID)	1	2016	1	2020

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force			Date: May 2017
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603742F / *Combat Identification Technology*	Project (Number/Name) 642599 / *Cooperative Identification Techniques*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
642599: *Cooperative Identification Techniques*	-	1.831	1.912	1.955	0.000	1.955	1.986	2.023	2.058	2.100	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Cooperative Combat Identification (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 identification capabilities. Development funded by this project ensures availability of a Mode 5 upgrade path for implementing ground and air platforms across the Air Force fleet.

Fund AIMS Program Office test engineers. The DoD International AIMS PO has system level interoperability testing and certification responsibilities for the present Mark XII system, development and integration of Mark XIIA (Mode 5) and transition to Mark XIIA Mode S systems. AIMS PO will continue to test and certify IFF equipment for the services now as long as IFF is used for combat identification.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Air Traffic Control and Radar Beacon Systems Identification Friend or Foe Mark XIIA System (AIMS) Program Office	1.831	1.912	1.955	0.000	1.955
Description: Fund AIMS Program Office test engineers. The DoD International AIMS PO has system level interoperability testing and certification responsibilities for the present Mark XII system, development and integration of Mark XIIA (Mode 5) and transition to Mark XIIA Mode S (ADS-B) systems.					
FY 2016 Accomplishments: - Continued to fund AIMS for interoperability testing, FAA liason, and support of Mode 4 / Mode 5 equipment.					
FY 2017 Plans: - Continue to fund AIMS for interoperability IFF testing (civil and military), FAA liaison, to support of Mode 4 / Mode 5 equipment, updating and developing IFF standards.					
FY 2018 Base Plans: - Will continue to fund AIMS for interoperability IFF testing (civil and military), FAA liaison, to support of Mode 4 / Mode 5 equipment, updating and developing IFF standards.					
FY 2018 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*	**Project (Number/Name)** 642599 / *Cooperative Identification Techniques*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
N/A					
Accomplishments/Planned Programs Subtotals	1.831	1.912	1.955	0.000	1.955

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Combat Identification develops technologies for exploitation by the USAF and the other services.
Award multiple, competitive contract vehicles emphasizing off-the-shelf technology and maximizing the use of non-developmental items (NDIs).
Management develops a technology to a point it can be demonstrated in a relative combat environment.

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.