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 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603203F: *Advanced Aerospace Sensors*	

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	71.700	44.677	53.075	-	53.075	52.615	53.871	52.128	52.985	Continuing	Continuing
63665A: *Advanced Aerospace Sensors Technology*	26.202	22.996	27.449	-	27.449	27.196	27.259	24.329	24.729	Continuing	Continuing
6369DF: *Target Attack and Recognition Technology*	45.498	21.681	25.626	-	25.626	25.419	26.612	27.799	28.256	Continuing	Continuing

A. Mission Description and Budget Item Justification

Divided into two broad project areas, this program develops technologies to enable the continued superiority of sensors from aerospace platforms. The first project develops and demonstrates advanced technologies for electro-optical sensors, radar sensors and electronic counter-countermeasures, and components and algorithms. The second project develops and demonstrates radio frequency and electro-optical sensors for detecting, locating, and targeting airborne, fixed, and time-critical mobile ground targets obscured by natural or man-made means. Together, the projects in this program develop the means to find, fix, target, track, and engage air and ground targets anytime, anywhere, and in any weather. This program has been coordinated through the Reliance 21 process to harmonize efforts and eliminate duplication. This program is in Budget Activity 3, Advanced Technology Development, since it develops and demonstrates technologies for existing system upgrades and/or new sensor and electronic combat system developments that have military utility and address warfighter needs.

B. Program Change Summary ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Previous President's Budget	52.786	44.677	50.650	-	50.650
Current President's Budget	71.700	44.677	53.075	-	53.075
Total Adjustments	18.914	-	2.425	-	2.425
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	4.084	-			
• SBIR/STTR Transfer	-1.170	-			
• Other Adjustments	16.000	-	2.425	-	2.425

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2010	FY 2011
Project: 6369DF: *Target Attack and Recognition Technology*		
Congressional Add: *Reconfigurable Secure Computing Technologies*	1.593	-
	1.593	-

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Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2010	FY 2011
Congressional Add Subtotals for Project: 6369DF		
Congressional Add Totals for all Projects	1.593	-

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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
63665A: *Advanced Aerospace Sensors Technology*	26.202	22.996	27.449	-	27.449	27.196	27.259	24.329	24.729	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project develops and demonstrates aerospace sensor and processing technologies for intelligence, surveillance, reconnaissance, target, and attack radar applications in both manned and unmanned platforms, including electro-optical sensors and electronic counter-countermeasures for radars. It provides aerospace platforms with the capability to precisely detect, track, and target both airborne (conventional and low radar cross-section) and ground-based, high-value, time-critical targets in adverse clutter and jamming environments. Project activities include developing multi-function radio-frequency systems including radar and electronic warfare technology. Desired warfighting capabilities include the ability to detect concealed targets in difficult background conditions.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: Major Thrust 1.	3.837	1.317	1.404	-	1.404
Description: Develop electro-optical sensor technology to detect, locate, and identify air and ground targets at long ranges, including those that are low-observable, or use deception or camouflage.					
FY 2010 Accomplishments: Completed end-to-end performance characterization, via airborne flight test, of high-resolution, three-dimensional laser radar for high confidence target identification coupled with passive spectral imaging for low false alarm rate detection utilizing change detection and spatial-spectral discrimination techniques. Designed airborne multispectral/polarimetric sensor module for long range target discrimination and integrated laser radar for long range identification of stationary and moving targets.					
FY 2011 Plans: Perform concept validation and signature utility experiments for long range multispectral/polarimetric and synthetic aperture laser radar imaging. Continue signature collection experiments with multispectral/polarimetric imaging systems to assess military utility. Initiate laboratory and field experiments for mitigating primary risk areas associated with synthetic aperture laser radar imaging from airborne platforms.					
FY 2012 Base Plans:					

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Perform concept validation and signature utility experiments for long range synthetic aperture laser radar imaging. Continue laboratory and field experiments for mitigating primary risk areas associated with synthetic aperture laser radar imaging from airborne platforms. Initiate development of master oscillator technology. ***FY 2012 OCO Plans:***					
Title: Major Thrust 2. ***Description:*** Develop technologies to maximize positional accuracy, timing accuracy, and exploitation techniques to improve offensive and defensive combat capabilities. ***FY 2010 Accomplishments:*** Demonstrated optimized reference for precise emitter geolocation, utilizing advanced two-way time transfer techniques. Explored feasibility and goals for reference optimization for bi-static and multi-static radar application. ***FY 2011 Plans:*** Develop reference optimization components necessary to support bi-static and multi-static radar technologies. Evaluate progress and determine next spiral requirements. ***FY 2012 Base Plans:*** Develop geo-spatial, time independent technologies addressing the shortfalls discovered during assessment of bi-static and multi-static radar technologies. ***FY 2012 OCO Plans:***	0.700	1.232	1.462	-	1.462
Title: Major Thrust 3. ***Description:*** Develop light, low power, compact RF sensors to use against difficult-to-detect targets, enable persistent ISR from remotely piloted aircraft (RPA), and detect advanced air and ground targets. ***FY 2010 Accomplishments:*** Demonstrated radio-frequency sensors (Ultra-High Frequency (UHF) radar, X-band radar, electronic support sensors) of an integrated electro-optical/radio-frequency sensor suite for RPA with severe size, weight, and power constraints to enable persistent intelligence, surveillance, and reconnaissance capabilities compatible with a system of systems architecture. Used the modeling, simulation, and analysis test bed, including radio-frequency and electro-optical sensing modes, to provide input into the required design for an integrated electro-	17.121	14.899	18.045	-	18.045

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
optical/radio-frequency sensor suite, including required data processing and exploitation. Provided sensor systems engineering support fostering the transition of developed enabling technologies and concepts to weapon systems and intelligence, surveillance, and reconnaissance assets. Enhanced the systems engineering to consider the optimal use of a high-altitude, long-endurance sensor platform within a layered sensing architecture. ***FY 2011 Plans:*** Complete demonstration of the radio-frequency sensors (Ultra-High Frequency (UHF) radar, X-band radar, electronic support sensors) of an integrated electro-optical/radio-frequency sensor suite for RPA with severe size, weight, and power constraints to enable single platform persistent intelligence, surveillance, and reconnaissance capabilities compatible with a system of systems architecture. Include in the demonstration simultaneous air and ground target tracking. Design and demonstrate multiple radio frequency emitter/receiver sensor operation to include waveform diversity electronic protection techniques and advanced high range resolution target response characteristics. Continue to improve the capabilities of receivers in a passive mode to enhance the detection and tracking of airborne and ground based targets with low radar cross section (including dismounts), concealment capabilities, or employment of electronic counter-countermeasures. Emphasis is on low cost sensing capability to bolster system ubiquity. ***FY 2012 Base Plans:*** Complete dismount detection systems engineering analysis and demonstration. Initiate test and evaluation of dismount radar detection back end and algorithms in conjunction with the outdoor range. Initiate persistent multiple intelligence sources (multi-INT) layered sensing demonstration. Continue development of common RF backend (demonstration of open systems architecture) for combined radar and signals intelligence (SIGINT) processing for eventual integration into the outdoor range. Complete development and testing of reconfigurable array manifold and initiate integration with multi-channel receiver for system demonstration. Continue outdoor range operations and experiments and enhance capabilities including multi-channel X-band radar, develop dual channel, solid state S-band transmitter for polarization experimentation and 3D imaging with noise radars. Provide technical support to a high altitude radar demonstration. ***FY 2012 OCO Plans:***					
Title: Major Thrust 4. ***Description:*** Develop technologies to provide precision position and timing information to enable distributed, layered sensing on large air and space vehicles in a global position system (GPS)-denied environments.	2.055	3.969	4.422	-	4.422

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
FY 2010 Accomplishments: Designed reduced size, weight, and power precision time, position, and velocity sensor techniques for space-based, airborne, and ground-based applications. Demonstrated constructive systems engineering model to assess assured reference techniques in terms of measures of performance and warfighter utility. Enhanced multi-ship virtual flight test simulation technology to assess world-wide distributed position, navigation, and timing architectures for disparate platforms enabling distributed, layered sensing. ***FY 2011 Plans:*** Design reduced size, weight, and power for precision time, position, and velocity sensor consisting of a single integrated GPS and inertial sensor for stringent installation requirements characteristic of small RPA appropriate for distributed, layered sensing. Continue demonstration through a constructive systems engineering model to assess assured reference techniques in terms of measures of performance and warfighter utility. ***FY 2012 Base Plans:*** Develop strategies to optimize reference technologies for distributed sensing missions. Explore alternatives when GPS is degraded or denied. Reduce size, weight, and power of inertial components. Enhance precision of GPS and non-GPS reference technologies. ***FY 2012 OCO Plans:***					
Title: Major Thrust 5. ***Description:*** Develop infrared surveillance technologies for continuous surveillance of dynamic targets in urban areas from high altitude RPA and manned platforms. ***FY 2010 Accomplishments:*** Initiated an effort to perform design studies and concept demonstration experiments for exploiting novel temporal, spectral, and polarimetric discrimination based on infrared sensors to rapidly detect, locate, identify, and characterize battlefield targets and events over broad theater-sized areas. ***FY 2011 Plans:*** Initiate concept demonstration experiments, beginning with ground-based experiments, for exploiting novel temporal, spectral, and polarimetric discrimination based on infrared sensors to rapidly detect, locate, identify, and characterize battlefield targets and events in urban areas. Leverage large format, infrared focal plane array	0.929	1.579	2.116	-	2.116

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
technology developed under other component development projects and assess utility for high altitude and space platforms. ***FY 2012 Base Plans:*** Continue concept demonstration experiments for exploiting infrared persistent surveillance imagery to detect, track, and characterize targets in urban areas. Perform utility assessment experiments to quantify system performance and develop image processing techniques. Continue development of large format infrared camera technology for distributed airborne surveillance. ***FY 2012 OCO Plans:***					
Title: Major Thrust 6. ***Description:*** Reduce technology risk for space sensor platform payload components and exploitation of infrastructure integration. ***FY 2010 Accomplishments:*** Developed Mission Design Tool kit and experimental hardware for class III (scalable payloads) sensors. Begin to address PnP (Plug and Play) concepts for large satellite systems. ***FY 2011 Plans:*** ***FY 2012 Base Plans:*** ***FY 2012 OCO Plans:***	1.560	-	-	-	-
Accomplishments/Planned Programs Subtotals	26.202	22.996	27.449	-	27.449

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

N/A

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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.

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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
6369DF: *Target Attack and Recognition Technology*	45.498	21.681	25.626	-	25.626	25.419	26.612	27.799	28.256	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project develops and demonstrates advanced technologies for attack management, fire control, and target identification and recognition. This includes developing and demonstrating integrated and cooperative fire control techniques to provide for adverse-weather precision air strikes against multiple targets per pass and at maximum weapon launch ranges. Specific fire control technologies under development include attack management, sensor fusion, automated decision aids, advanced tracking for low radar cross section threats, and targeting using both on-board and off-board sensor information. This project also evaluates targeting techniques to support theater missile defense efforts in surveillance and attack. These fire control technologies will provide force multiplication and reduce warfighter exposure to hostile fire. This project also develops and demonstrates target identification and recognition technologies for positive, high confidence cueing, recognition, and identification of airborne and ground-based, high-value, time-critical targets at longer ranges than are currently possible. The goal is to apply these technologies to tactical air-to-air and air-to-surface weapon systems so they are able to operate in all weather conditions, during day or night, and in high-threat, multiple target environments. Model-based vision algorithms and target signature development techniques are the key to target identification and recognition. This project is maturing these technologies in partnership with the Defense Advanced Research Projects Agency and evaluating the techniques to support theater missile defense efforts in surveillance and attack. Fire control and recognition technologies developed and demonstrated in this project are high leverage efforts, providing for significant advancements in operational capabilities largely through software improvements readily transitionable to new and existing weapon systems.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: Major Thrust 1. ***Description:*** Develop and test an automatic target recognition system for tracking and identifying moving and stationary ground targets for use in strike and reconnaissance platforms. ***FY 2010 Accomplishments:*** Completed the transition of moving target algorithm technology to operational strike and reconnaissance platforms. ***FY 2011 Plans:*** ***FY 2012 Base Plans:*** ***FY 2012 OCO Plans:***	0.096	-	-	-	-
Title: Major Thrust 2.	1.905	3.077	4.721	-	4.721

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Description: Develop and assess multi-sensor automatic target recognition for intelligence, surveillance, reconnaissance, strike, and weapon systems. ***FY 2010 Accomplishments:*** Conducted spiral development and assessment of multi-sensor automatic target recognition fusion algorithms. Conducted assessment of technology supporting intelligence, surveillance, reconnaissance, strike, and weapon systems using the Air Force automatic target recognition test and evaluation facility. Conducted spiral development and validation of synthetic data generation capability critically needed to augment collected research, development, and operational data sets. Developed an automatic target recognition fusion sensor data exploitation capability utilizing analysis and experimentation of data independence and interdependence of features to support development of an optimum data fusion exploitation capability. Enhanced the Air Force automatic target recognition test and evaluation facility and data sets as required to support enhanced automatic target recognition fusion capabilities. Determined technology shortfalls and developed automatic target recognition fusion technologies to overcome these shortfalls. Executed a laboratory demonstration of technology developed to date. ***FY 2011 Plans:*** Continue spiral development and assessment of multi-sensor automatic target recognition fusion algorithms. Continue assessment of technology supporting intelligence, surveillance, reconnaissance, strike, and weapon systems using the Air Force automatic target recognition test and evaluation facility. Continue spiral development and validation of synthetic data generation capability critically needed to augment collected research, development, and operational data sets. Begin development of signature science for automatic target recognition database development. Continue development of an automatic target recognition fusion sensor data exploitation capability utilizing analysis and experimentation of data independence and interdependence of features to support development of an optimum data fusion exploitation capability. Enhance the Air Force automatic target recognition test and evaluation facility and data sets as required to support enhanced automatic target recognition fusion capabilities. Determine technology shortfalls and develop automatic target recognition fusion technologies to overcome these shortfalls. Execute a field demonstration of technology developed to date. ***FY 2012 Base Plans:*** Continue spiral development and assessment of multi-sensor automatic target recognition fusion algorithms. Continue assessment of technology supporting intelligence, surveillance, reconnaissance, strike, and					

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
weapon systems using the Air Force automatic target recognition test and evaluation facility. Continue spiral development and validation of synthetic data generation capability critically needed to augment collected research, development, and operational data sets. Assess development of signature science for automatic target recognition database and initiate development of techniques addressing those shortfalls. Continue development of an automatic target recognition fusion sensor data exploitation capability utilizing analysis and experimentation of data independence and interdependence of features to support development of an optimum data fusion exploitation capability. Enhance the Air Force automatic target recognition test and evaluation facility and data sets as required to support enhanced automatic target recognition fusion capabilities. Determine technology shortfalls and develop automatic target recognition fusion technologies to overcome these shortfalls. Assess technology performance as deployed at a field demonstration. ***FY 2012 OCO Plans:***					
Title: Major Thrust 3. ***Description:*** Develop and demonstrate a moderate-confidence automatic target recognition (ATR) and advanced cueing capability for stationary and moving targets. ***FY 2010 Accomplishments:*** Developed an electro-optic enhanced automatic target recognition system based on improvements provided by the multi-sensor fusion algorithms, the three-dimensional laser-detection-and-ranging automatic target recognition algorithms that were previously evaluated, the laser vibrometry algorithms and the sensor management suite that were previously evaluated. Enhanced laser sensor exploitation tools as required to support spiral ATR development. Enhanced automatic target recognition evaluation test facility and data sets as necessary to support program requirements. ***FY 2011 Plans:*** ***FY 2012 Base Plans:*** ***FY 2012 OCO Plans:***	2.714	-	-	-	-
Title: Major Thrust 4. ***Description:*** Develop and demonstrate an automatic target recognition capability integrated with advanced geo-registration techniques and innovative change detection algorithms.	1.011	2.193	2.339	-	2.339

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
FY 2010 Accomplishments: Assessed performance of developed technology and developed enhancements to automatic target recognition, automatic target cueing, geo-registration, and change detection technology to meet warfighter needs. Assessed and enhanced technology supporting time-critical targeting systems in the Air Force automatic target recognition test and evaluation facility. Conducted spiral development and validation of synthetic data generation capability critically needed to augment collected research, development, and operational data sets. Enhanced the Air Force automatic target recognition test and evaluation facility and data sets as required to support enhanced time-critical targeting capabilities. Conducted spiral development and assessment development of time-critical targeting and advanced target tracking technologies required to meet warfighter requirements. ***FY 2011 Plans:*** Determine state of the art technology capabilities and spirally develop enhancements to automatic target recognition, automatic target cueing, geo-registration, and change detection technology to meet warfighter needs. Continue assessment and enhancement of technology supporting time-critical targeting systems in the Air Force automatic target recognition test and evaluation facility. Continue spiral development and validation of synthetic data generation capability critically needed to augment collected research, development, and operational data sets. Enhance the Air Force automatic target recognition test and evaluation facility and data sets as required to support enhanced time-critical targeting capabilities. ***FY 2012 Base Plans:*** Determine technology shortfalls in automatic target recognition, automatic target cueing, geo-registration, and change detection technology to meet warfighter needs. Begin technology development addressing identified shortfalls. Continue assessment and enhancement of technology supporting time-critical targeting systems in the Air Force automatic target recognition test and evaluation facility. Continue spiral development and validation of synthetic data generation capability critically needed to augment collected research, development, and operational data sets. Enhance the Air Force automatic target recognition test and evaluation facility and data sets as required to support enhanced time-critical targeting capabilities. ***FY 2012 OCO Plans:***					
Title: Major Thrust 5. ***Description:*** Develop an identify friend, foe, or neutral, air-to-ground capability using cooperative and non-cooperative identification techniques.	1.355	1.018	0.966	-	0.966

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
FY 2010 Accomplishments: Integrated, demonstrated, and assessed, in an operational environment, the improved ground target identification capabilities through enhanced target databases, identification algorithm advancements, and radio-frequency tags. Determined enhancements required to attain the required performance of these technologies to support warfighter needs. Refined identification algorithms, target databases, and exploitation tools as necessary to support transition of technology. ***FY 2011 Plans:*** Begin development of physics-based signature exploitation, modeling methods, and signal processing for feature-based recognition and fusion and apply these methods to sensor design to enable performance-based sensing. Begin development of an integrated radar sensor signature exploitation and signal processing analysis capability for recognition applications including staring radar, Combat Identification (CID), Space Situational Awareness, Measurement and Signatures Intelligence (MASINT), and intelligence, surveillance, and reconnaissance (ISR) applications. Develop efficient methods for collecting and processing radar sensor data for recognition. Begin development of methods to analyze salient features to aid in the prediction, analysis, and processing capability as a function of sensor design parameters for performance-driven sensing. ***FY 2012 Base Plans:*** Assess the state of the art of physics-based signature exploitation, modeling methods, and signal processing for feature-based recognition and fusion. Develop techniques addressing these shortfalls. Continue development of an integrated radar sensor signature exploitation and signal processing analysis capability for recognition applications including staring radar, Combat Identification (CID), Space Situational Awareness, MASINT, and ISR applications. Develop efficient methods for collecting and processing radar sensor data for recognition. Continue development of methods to analyze salient features to aid in the prediction, analysis, and processing capability as a function of sensor design parameters for performance-driven sensing. Develop a loosely coupled capability for multi-sensor measurement, processing, modeling and analysis methods to support target recognition database development efforts and MASINT applications. ***FY 2012 OCO Plans:***					
Title: Major Thrust 6. ***Description:*** Develop wide angle, persistent, multi-sensor/wavelength sensing and automated exploitation technology to detect, track, and identify targets over large areas at low sensor update rates.	10.885	9.241	8.841	-	8.841

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
FY 2010 Accomplishments: Developed, integrated, and tested the next spiral engineering model of the multi-sensor, multi-wavelength wide-angle, continuously-staring capability building upon the technologies developed during the individual component stage. Integrated, demonstrated, and tested the enhanced, spiral two, wide angle, continuously-staring component technologies via a combination of exercises and scientific analyses in the Air Force automatic target recognition test and evaluation facility. Conducted spiral development of wide angle, continuous staring exploitation algorithms, phenomenological modeling, target and scenario databases necessary to support transition to the warfighter. Identifed emerging technologies for a sense and avoid capability for Reaper-class remotely piloted aircraft. ***FY 2011 Plans:*** Develop, integrate and test to technology readiness level (TRL) 5, the next spiral engineering model of the multi-sensor, multi-wavelength wide-angle, continuously-staring capability building upon the technologies developed during the previous demonstration. Integrate, demonstrate and test the enhanced, TRL 5, wide angle, continuously-staring component technologies via a combination of exercises and scientific analyses in the Air Force automatic target recognition test and evaluation facility. Continue spiral development of wide angle, continuous staring exploitation algorithms, phenomenological modeling, target and scenario databases necessary to support transition to the warfighter. Increase TRL to 5 and demonstrate in a militarily significant scenario, evaluate results and begin transition. Demonstrate open and closed-loop autonomous sense and avoid capability on a surrogate aircraft. ***FY 2012 Base Plans:*** Assess wide angle, continuous staring exploitation algorithms, phenomenological modeling, target and scenario databases for sufficiency in supporting mission requirements. Based on identified shortfalls, continue spiral development of wide angle, continuous staring exploitation algorithms, phenomenological modeling, target and scenario databases necessary to support transition to the warfighter. ***FY 2012 OCO Plans:***					
Title: Major Thrust 7. ***Description:*** Develop an advanced suite of sensors with automatic target recognition, fusion, and target tracking, all working in concert to provide a high-confidence identification capability. ***FY 2010 Accomplishments:***	9.627	6.048	8.671	-	8.671

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Integrated the advanced aimpoint tracking, electro-optical automatic target recognition, synthetic aperture radar automatic target recognition and the multi-sensor fusion algorithms. Tested the integrated system and develop the second spiral requirements. Enhanced phenomenological modeling, target and scenario databases and exploitation tools necessary to support spiral two technology development. Assessed maturity of technology during the spiral process via the Air Force automatic target recognition test and evaluation facility and other sensor test facilities. ***FY 2011 Plans:*** Identify candidate technologies to improve aimpoint tracking, electro-optical automatic target recognition, synthetic aperture radar automatic target recognition and the multi-sensor fusion algorithms. Predict performance of the integrated technologies and system. Enhance phenomenological modeling, target and scenario databases and exploitation tools necessary to support technology development. Assess maturity of applicable technology during the Air Force automatic target recognition test and evaluation facility and other sensor test facilities. ***FY 2012 Base Plans:*** Continue development of technologies to address deficiencies to improve aimpoint tracking, electro-optical automatic target recognition, synthetic aperture radar automatic target recognition and the multi-sensor fusion algorithms. Validate prediction performance of the integrated technologies and system and determine technology shortfalls. Continue enhancement of phenomenological modeling, target and scenario databases and exploitation tools necessary to support technology development. Continue assessment of applicable technology during the via the Air Force automatic target recognition test and evaluation facility and other sensor test facilities. Improve and enhance capabilities in spiral fashion. ***FY 2012 OCO Plans:***					
Title: Major Thrust 8. ***Description:*** Investigate airborne techniques and algorithms for space object identification and characterization, and airborne technology for multi-sensor data fusion for better characterization. ***FY 2010 Accomplishments:***	0.312	0.104	0.088	-	0.088

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APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603203F: *Advanced Aerospace Sensors*	PROJECT 6369DF: *Target Attack and Recognition Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Initiated an effort to process multiple sources of ground based space situational awareness data on various space objects using upgraded space object ID algorithms for validation, along with upgrades to a space object ID database. ***FY 2011 Plans:*** Begin spiral development and assessment of multi-sensor, space object focused, automatic target recognition fusion algorithms. Assess technology supporting space object recognition in the Air Force automatic target recognition test and evaluation facility. Continue spiral development and validation of synthetic data generation capability critically needed to augment collected research, development, and operational data sets. Critically examine target and scenario data to determine independence and interdependence of features to support development of an optimum data fusion exploitation capability. Incorporate enhanced Space Object Identification models into advanced space situational awareness experiments. Continue enhancement of the Air Force automatic target recognition test and evaluation facility and data sets as required to support enhanced space situational awareness automatic target recognition fusion capabilities. ***FY 2012 Base Plans:*** Continue spiral development and assessment of multi-sensor, space object focused, automatic target recognition fusion algorithms. Assess technology supporting space object recognition in the Air Force automatic target recognition test and evaluation facility. Validate synthetic data generation capability critically needed to augment collected research, development, and operational data sets. Initiate research into techniques to address discovered shortfalls. Critically examine target and scenario data to determine independence and interdependence of features to support development of an optimum data fusion exploitation capability. Continue to incorporate enhanced Space Object Identification (SOI) models into advanced space situational awareness experiments. Continue enhancement of the Air Force automatic target recognition test and evaluation facility and data sets as required to support enhanced space situational awareness automatic target recognition fusion capabilities. ***FY 2012 OCO Plans:***					
Title: Major Thrust 9. ***Description:*** Develop an airship for the Blue Devil 2 demonstration. Note: This funding was added by Congress in the FY10 Overseas Contingency Operations bill.	16.000	-	-	-	-

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 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603203F: *Advanced Aerospace Sensors*	PROJECT 6369DF: *Target Attack and Recognition Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
FY 2010 Accomplishments: Develop an airship for the Blue Devil Block 2 demonstration. A portion of development funding was provided by the Army using funds added by Congress in the FY10 Overseas Contingency Operations bill. ***FY 2011 Plans:*** ***FY 2012 Base Plans:*** ***FY 2012 OCO Plans:***					
Accomplishments/Planned Programs Subtotals	43.905	21.681	25.626	-	25.626

	FY 2010	FY 2011
Congressional Add: Reconfigurable Secure Computing Technologies	1.593	-
FY 2010 Accomplishments: Conducted Congressionally-directed effort.		
FY 2011 Plans:		
Congressional Adds Subtotals	1.593	-

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

N/A

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.