Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Air Force											Date: February 2016	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 2: *Applied Research*					R-1 Program Element (Number/Name) PE 0602204F / *Aerospace Sensors*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	-	118.654	152.175	155.174	0.000	155.174	162.992	164.291	167.682	169.931	Continuing	Continuing
622002: *Electronic Component Technology*	-	27.194	38.234	41.326	0.000	41.326	41.991	42.115	42.927	43.495	Continuing	Continuing
622003: *EO Sensors & Countermeasures Tech*	-	27.387	26.805	21.535	0.000	21.535	26.813	26.979	27.556	27.974	Continuing	Continuing
622005: *Cyber Technology*	-	0.000	0.000	10.200	0.000	10.200	6.520	6.649	6.788	6.855	Continuing	Continuing
626095: *Sensor Fusion Technology*	-	24.037	27.359	35.322	0.000	35.322	35.655	36.262	37.044	37.544	Continuing	Continuing
627622: *RF Sensors and Countermeasures Tech*	-	40.036	59.777	46.791	0.000	46.791	52.013	52.286	53.367	54.063	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program develops the technology base for Air Force aerospace sensors and electronic combat. Advances in aerospace sensors are required to increase combat effectiveness by providing anytime, anywhere surveillance, reconnaissance, precision targeting, and electronic warfare capabilities. To achieve this progress, this program pursues simultaneous advances in: 1) generating, controlling, receiving, and processing electronic and photonic signals for radio frequency (RF) sensor aerospace applications; 2) electro-optical (EO) aerospace sensor technologies for a variety of offensive and defensive uses; 3) RF antennas and associated electronics for airborne and space surveillance, together with active and passive EO sensors; 4) technologies to manage and fuse on-board sensor information for timely, comprehensive situational awareness; and 5) technology for reliable, all-weather surveillance, reconnaissance, and precision strike RF sensors and electronic combat systems. This program has been coordinated through the Department of Defense (DoD) Science and Technology (S&T) Executive Committee process to harmonize efforts and eliminate duplication.

Starting in FY 2017 to improve reporting to Congress, Project 622005, Cyber Technology was created to capture all cyber activity that was previously performed in this program.

This program is in Budget Activity 2, Applied Research because this budget activity includes studies, investigations, and non-system specific technology efforts directed toward general military needs with a view toward developing and evaluating the feasibility and practicality of proposed solutions and determining their parameters.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Air Force		Date: February 2016
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 2: *Applied Research*	**R-1 Program Element (Number/Name)** PE 0602204F / *Aerospace Sensors*	

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	118.321	147.291	173.838	0.000	173.838
Current President's Budget	118.654	152.175	155.174	0.000	155.174
Total Adjustments	0.333	4.884	-18.664	0.000	-18.664
• Congressional General Reductions	0.000	-0.116			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	5.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	1.524	0.000			
• SBIR/STTR Transfer	-1.191	0.000			
• Other Adjustments	0.000	0.000	-18.664	0.000	-18.664

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2015	FY 2016
Project: 627622: *RF Sensors and Countermeasures Tech*		
Congressional Add: *Program Increase*	-	5.000
Congressional Add Subtotals for Project: 627622	-	5.000
Congressional Add Totals for all Projects	-	5.000

Change Summary Explanation

Increase in FY 2015 reflects reprogramming to support Research and Development Projects, 10 U.S.C. Section 2358

Decrease in FY 2017 due to higher DoD priorities.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force			Date: February 2016
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602204F / *Aerospace Sensors*	Project (Number/Name) 622002 / *Electronic Component Technology*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
622002: *Electronic Component Technology*	-	27.194	38.234	41.326	0.000	41.326	41.991	42.115	42.927	43.495	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project focuses on generating, controlling, receiving, and processing electronic signals for RF sensor aerospace applications. The enabling technologies developed under this project will be used for intelligence, surveillance, reconnaissance (ISR), electronic warfare, battlespace access, and precision engagement capabilities. The technologies developed include exploratory device concepts; solid state power devices and amplifiers; low noise and signal control components; photonic components; high-temperature electronics; signal control and distribution; signal processing; multi-function monolithic integrated circuits; high-speed analog-to-digital and digital-to-analog mixed mode integrated circuits; reconfigurable electronics; power distribution; multi-chip modules; and high density packaging and interconnect technologies. This project also designs, develops, fabricates, and evaluates techniques for integrating combinations of these electronic component technologies. The project aims to demonstrate significantly improved military sensors of smaller size, lower weight, lower cost, lower power dissipation, higher reliability, and improved performance. The device and component technology developments under this project are military unique; they are based on Air Force and other Department of Defense weapon systems requirements in the areas of radar, communications, electronic warfare, navigation, and smart weapons.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Title: Multifunction Sensor Subsystems	8.120	9.222	9.961
Description: Develop, analyze, demonstrate, and perform engineering trade studies for technologies for compact, affordable, multi-function subsystems for aerospace sensors. ***FY 2015 Accomplishments:*** Developed, refined and demonstrated advanced trade space and prediction tools for emerging devices. Completed engineering trade analysis for baseline sensing system technologies. Continued development of trade space models for advanced system of systems sensing and electronic warfare simulations. ***FY 2016 Plans:*** Complete baseline trade space models for use in advanced system of systems simulations. Complete advanced trade space tools for emerging technologies. Continue development of advanced prediction tools. Initiate next level of fidelity models for advanced future multifunction subsystem concepts. Initiate prototype multi-function demonstrations of concepts determined through analysis and design tools. ***FY 2017 Plans:*** Complete development of next generation advanced prediction tools. Refine fidelity of models for multifunction subsystem concepts. Continue to develop and optimize multi-function prototypes.			
Title: Microelectronic/Optoelectronic Technologies	9.061	10.145	10.987

Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force		Date: February 2016
Appropriation/Budget Activity 3600 / 2	**R-1 Program Element (Number/Name)** PE 0602204F / *Aerospace Sensors*	**Project (Number/Name)** 622002 / *Electronic Component Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Description: Develop and assess new microelectronic/optoelectronic material, device and fabrication technologies for next generation imaging, precision strike, and battlespace access across all Air Force domains. ***FY 2015 Accomplishments:*** Completed device concept baseline for multi-use (sense environments and counter threat) applications. Continued the identification and evaluation of concepts for compact, high performance devices and components. Demonstrated projected gains through characterization of test articles in relevant environments. Continued development of tools and methods to design and analyze game-changing components. ***FY 2016 Plans:*** Complete identification and evaluation of innovative concepts for generation after next compact, high performance devices and components. Demonstrate prototype of a highly integrated microsystem. Continue to refine tools and methods to design, build and analyze game changing component technologies. Initiate evaluation of emerging component technologies against device concept baseline for multi-use applications. ***FY 2017 Plans:*** Continue to refine tools and methods to design, build, and analyze game changing component technologies. Continue evaluation of emerging component technologies against device concept baseline for multi-use applications. Initiate exploration and identification of next generation device concepts exploiting breakthrough materials discovery.			
Title: Antennas ***Description:*** Design and develop antenna subsystems and components for airborne and space-based surveillance. Develop novel and advanced antennas for lightweight, conformal arrays. ***FY 2015 Accomplishments:*** Continued fabrication and characterization of innovative devices to extend bandwidth, reconfigurability, tunability, and trustworthiness. Continued demonstrations of multi-wavelength, agile and affordable advanced detectors and arrays with emphasis on integrated filtering. Continued the design and fabrication of high-brightness and agile waveform sources to integrate into microsystems and subsystems. ***FY 2016 Plans:*** Continue to explore and evaluate innovative devices for increase bandwidth and tunability. Continue demonstrations of multi-wavelength, agile and affordable advanced detectors and arrays. Complete characterization and evaluation of novel high-brightness and agile waveform source. ***FY 2017 Plans:***	4.763	5.417	5.851

Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force		Date: February 2016
Appropriation/Budget Activity 3600 / 2	**R-1 Program Element (Number/Name)** PE 0602204F / *Aerospace Sensors*	**Project (Number/Name)** 622002 / *Electronic Component Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Continue to explore and evaluate innovative materials and devices for reduced cost, size, weight and power consumption. Initiate identification of novel device concepts exploiting new material discoveries. Complete demonstration of current advanced multi-wavelength, agile and affordable advanced detector and array.			
Title: Trusted Systems for ISR and Avionics Systems ***Description:*** Investigate and develop designs of trusted electronic and optoelectronic systems when integrating commercially available solutions (commercial-off-the-shelf (COTS)) with emerging government-off-the-shelf (GOTS) advanced technologies. Areas of development include: multi-function RF and EO subsystems, advanced electronic and optoelectronic materials, on-board sensor processing, high-frequency power modules, Electro-Optical/Infrared (EO/IR) sources, EO/IR detectors, beam control and waveguides, and trusted and reliable electronics. ***FY 2015 Accomplishments:*** Continued the identification of COTS and GOTS technologies nearly ready or ready for integration into microsystem and subsystem demonstration. Developed, matured and demonstrated solutions utilizing COTS/GOTS technology that enable cyber-hardness, rad-hardness and resistance to tampering. ***FY 2016 Plans:*** Demonstrate trusted sensing and electronic warfare subsystem technologies utilizing the integration of low-cost commercially available electronics with exquisite emerging military electronics. Initiate vulnerability model and simulation capability to assess cost and liability of trust in electronics. ***FY 2017 Plans:*** Demonstrate latest ability to determine trust in design and trust in fabrication of highly integrated microsystems. Continue modeling and simulation architecture development to inform and predict mission assurance for highly integrated microsystems, devices and materials.	5.250	6.190	6.686
Title: Advanced Components for Electronic Warfare ***Description:*** Develop, mature, and demonstrate critical electronic technologies to enable revolutionary electronic warfare subsytems. ***FY 2015 Accomplishments:*** N/A ***FY 2016 Plans:*** For FY 2015, the work for this effort originally was performed in Project 622003, EO Sensors & Countermeasures Tech, under the effort EO/IR Sensors and Threat Countermeasures Technologies.	0.000	7.260	7.841

Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force		Date: February 2016
Appropriation/Budget Activity 3600 / 2	**R-1 Program Element (Number/Name)** PE 0602204F / *Aerospace Sensors*	**Project (Number/Name)** 622002 / *Electronic Component Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Develop, mature and demonstrate critical electronics technologies to enable highly agile, closed loop sense, learn and adapt revolutionary electronic warfare subsystems. Demonstrate advancements in real time hardware configurability and the integration at the microsystem level of electrons and photons. ***FY 2017 Plans:*** Continue to develop, mature and demonstrate technologies critical to advanced cognitive and networked electronic warfare subsystems and components. Identify and exploit advanced devices and microsystems to enable highly miniature and affordable Electronic Warfare (EW) systems. Continue to demonstrate advancements of real time hardware configurability through integration of electrons and photons at the microsystem level.			
Accomplishments/Planned Programs Subtotals	27.194	38.234	41.326

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

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.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force			Date: February 2016
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602204F / *Aerospace Sensors*	Project (Number/Name) 622003 / *EO Sensors & Countermeasures Tech*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
622003: *EO Sensors & Countermeasures Tech*	-	27.387	26.805	21.535	0.000	21.535	26.813	26.979	27.556	27.974	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project determines the technical feasibility of advanced electro-optical aerospace sensor technologies for a variety of offensive and defensive uses. The sensor technologies under development range from the ultraviolet through the infrared portion of the spectrum. Related efforts include improvements in avionics integration, digital processing, analysis tools, and sensor architectures. One of the project's main goals is to improve electro-optical and related technologies for the detection, tracking, and identification of non-cooperative and difficult targets, such as those obscured by camouflage. This project also develops the passive and active imaging sensors and algorithms needed to enable precision targeting in severe weather. These technologies are critical to future aerospace surveillance and targeting. Other project goals include advanced electro-optical threat warning and countermeasures.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Title: Non-cooperative Detection and Identification Technologies	11.864	0.000	0.000
Description: Develop innovative optical sensing technology for non-cooperative detection and identification of airborne and ground-based targets. ***FY 2015 Accomplishments:*** Evaluated, via modeling and simulation, innovative sensor concepts to increase long range image quality for passive electro-optical and infrared reconnaissance sensors for high altitude platforms. Advanced longwave infrared hyperspectral imaging and determined operationally useful radiometric sensitivity and area coverage rate for a sensor system that is practical and affordable. ***FY 2016 Plans:*** In FY 2016 and beyond, work accomplished under this effort will be reported under the effort Passive EO/IR Sensing in Contested Environments. ***FY 2017 Plans:*** N/A			
Title: EO/IR Sensors and Threat Countermeasure Technologies	7.791	0.000	0.000
Description: Develop optical and infrared sensors for airborne and space situational awareness and threat warning. Develop countermeasure technologies for use against infrared and electro-optical guided missile threats. ***FY 2015 Accomplishments:***			

Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force		Date: February 2016
Appropriation/Budget Activity 3600 / 2	**R-1 Program Element (Number/Name)** PE 0602204F / *Aerospace Sensors*	**Project (Number/Name)** 622003 / *EO Sensors & Countermeasures Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Initiated synthetic aperture ladar (SAL) techniques based on modeling and simulation previously conducted to enhance spatial resolution beyond the diffraction limit of conventional optics through the coherent collection and processing of laser illuminated scene radiance. Advanced research to improve system capabilities and provide high confidence target identification at standoff ranges for both reconnaissance and targeting platforms. ***FY 2016 Plans:*** In FY 2016 and beyond, work accomplished under this effort will be reported under the effort Laser Radar Sensing in Contested Environments and in project 622002, Electronic Component Technology, under the effort Advanced Components for Electronic Warfare. ***FY 2017 Plans:*** N/A			
Title: Optical Technologies ***Description:*** Develop optical spectrum transmitter, detector and agile aperture technologies capable of sensing multiple target characteristics for robust non-cooperative target identification and future infrared countermeasure systems. ***FY 2015 Accomplishments:*** Initiated research in the use of vibrometry and range-Doppler sensing technology to aid in target identification and decoy discrimination at ranges at which the imaging performance is insufficient. Supported phenomenology understanding, signature collection, sensor product visualization, and automatic target recognition in collaboration with other Air Force Research Laboratory directorates. Continued prototyping of a flexible, next generation long wave infrared hyperspectral imaging spectrometer. ***FY 2016 Plans:*** In FY 2016 and beyond, work accomplished under this effort will be reported under the effort Passive EO/IR Sensing in Contested Environments. ***FY 2017 Plans:*** N/A	7.732	0.000	0.000
Title: Passive EO/IR Sensing in Contested Environments ***Description:*** Develop innovative passive optical sensing technology to support surveillance and reconnaissance in contested environments. Develop high performance focal planes, aperture technologies and imaging techniques capable of long range target detection and characterization for ISR. ***FY 2015 Accomplishments:***	0.000	8.917	7.178

Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force		Date: February 2016
Appropriation/Budget Activity 3600 / 2	**R-1 Program Element (Number/Name)** PE 0602204F / *Aerospace Sensors*	**Project (Number/Name)** 622003 / *EO Sensors & Countermeasures Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
N/A ***FY 2016 Plans:*** For FY 2015, the work for this effort originally was performed under the effort Optical Technologies. Evaluate, via modeling and simulation, innovative sensor concepts to increase long range image quality for high altitude passive electro-optical and infrared reconnaissance sensors at twice the current operational range. Conduct initial demonstrations of the effectiveness of computational image restoration and noise reduction. Refine and demonstrate candidate component technologies for jitter mitigation and restoration in the presence of deep turbulence. Investigate system-level impacts of image restoration technology using a commercial reconnaissance sensor and platform. Determine the utility of non-traditional sensor architectures in improving image quality and the operational range of passive imagers. Mature longwave infrared hyperspectral imaging to achieve operationally useful radiometric sensitivity, detection performance, and area coverage rates at far off nadir viewing geometries. Continue prototyping of a flexible, next generation long wave infrared hyperspectral imaging spectrometer. Complete evaluations of prototype Silicon-Gallium (SiGa) long wave infrared detectors at high operating temperatures. Continue investigation of high performance long wave infrared detectors for hyperspectral imaging. Initiate technology developments for next generation infrared search and track (IRST) components and systems focused on performance in clutter using staring focal planes and reduced complexity implementations. Adapt passive sensing models to support IRST technology trade analyses. ***FY 2017 Plans:*** Evaluate, via modeling and simulation, innovative sensor concepts to increase long range image quality for high altitude passive electro-optical and infrared reconnaissance sensors at twice the current operational range. Test prototype systems and subsystems as appropriate to assess progress towards goals. Continue and advance demonstrations of the effectiveness of computational image restoration and noise reduction. Refine and demonstrate candidate component (hardware and software) technologies for jitter mitigation and restoration in the presence of deep turbulence. Demonstrate and test system-level impacts of image restoration technology using a relevant reconnaissance sensor and commercial platform. Continue the examination of non-traditional sensor architectures in improving image quality and the operational range of passive imagers. Demonstrate technologies and components supporting longwave infrared hyperspectral imaging at operationally useful radiometric sensitivity, detection performance, and area coverage rates at far off nadir viewing geometries. Continue prototyping of a flexible, next generation long wave infrared hyperspectral imaging spectrometer. Continue investigation of high performance long wave infrared detectors for hyperspectral imaging. Continue technology and architecture developments for next generation IRST components and systems focused on performance in clutter using novel optical concepts, staring focal planes, and reduced complexity implementations. Adapt passive sensing models to support IRST technology trade analyses. Explore concepts for merging IRST sensing with other sensing modalities.			
Title: Laser Radar Sensing in Contested Environments	0.000	17.888	14.357

Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force		Date: February 2016
Appropriation/Budget Activity 3600 / 2	**R-1 Program Element (Number/Name)** PE 0602204F / *Aerospace Sensors*	**Project (Number/Name)** 622003 / *EO Sensors & Countermeasures Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017

Description: Develop innovative laser sensing technology for non-cooperative detection and identification of airborne and ground-based targets in contested environments. Develop optical spectrum transmitters, detectors and agile aperture technologies capable of sensing multiple target characteristics for robust non-cooperative target identification and future infrared countermeasure systems.

FY 2015 Accomplishments:
N/A

FY 2016 Plans:
For FY 2015, the work for this effort originally was performed under the effort EO/IR Sensors and Threat Countermeasure Technologies.

Develop synthetic aperture ladar (SAL) techniques based on modeling and simulation previously conducted to enhance spatial resolution beyond the diffraction limit of conventional optics. Research the problem of improving system capabilities to provide high confidence target identification at standoff ranges for both reconnaissance and targeting platforms. Continue fabrication and characterization of critical components for a long range SAL demonstration system. Design and fabricate next generation long range holographic aperture ladar imaging testbed focused on progression to platform compatible configurations. Continue research in the use of remote laser vibrometry and range-Doppler sensing technology to aid in target identification and decoy discrimination at ranges at which the imaging performance is insufficient. Research will also support phenomenology understanding, signature collection, sensor product visualization, and automatic target recognition in collaboration with other Air Force Research Laboratory Technology Directorates. Conduct laboratory testing of initial foundry runs of focal planes optimized for three dimensional and holographic imaging. Increase emphasis on applications for long range air-to-air ladar updating modeling and simulation, phenomenology measurement capabilities and to support utility analysis and system design and evaluations.

FY 2017 Plans:
Advance developing SAL techniques to enhance spatial resolution beyond the diffraction limit of conventional optics. Continue research on technologies, architectures and components needed for improving system capabilities to provide high confidence target identification at standoff ranges for both reconnaissance and targeting platforms. Complete fabrication and characterization of critical components for a long range SAL demonstration system. Design, fabricate, test, and explore limitations of next generation long range holographic aperture ladar imaging testbed focused on progression to platform compatible configurations. Continue research in the use of remote laser vibrometry and range-Doppler sensing technology to aid in target identification and decoy discrimination at ranges at which the imaging performance is insufficient. Research will also support Phenomenology understanding, signature collection, sensor product visualization, and automatic target recognition in collaboration with other

Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force		Date: February 2016
Appropriation/Budget Activity 3600 / 2	**R-1 Program Element (Number/Name)** PE 0602204F / *Aerospace Sensors*	**Project (Number/Name)** 622003 / *EO Sensors & Countermeasures Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
AFRL Directorates. Complete laboratory testing of initial foundry runs of focal planes optimized for three dimensional and holographic imaging. Increase emphasis on applications for long range air-to-air ladar updating modeling and simulation, phenomenology measurement capabilities and to support utility analysis and system design and evaluations. Explore concepts for merging air-to-air sensing with other sensing modalities.			
Accomplishments/Planned Programs Subtotals	27.387	26.805	21.535

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

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.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force			Date: February 2016
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602204F / *Aerospace Sensors*	Project (Number/Name) 622005 / *Cyber Technology*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
622005: *Cyber Technology*	-	0.000	0.000	10.200	0.000	10.200	6.520	6.649	6.788	6.855	Continuing	Continuing

A. Mission Description and Budget Item Justification

Project 622005, Cyber Technology is new for FY 2017. Work from this effort was previously performed under Project 627622, RF Sensors and Countermeasures Tech, in this program.

The goal of this activity is to develop adaptable and resilient hardware for real-time avionics cyber-attack pattern recognition and develop a protection system with the capability for autonomous learning, adaptation, and self-protection.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Title: Malware Detection	0.000	0.000	4.453
Description: Develop tools and capabilities to detect and classify malware in avionics software and firmware to preclude their introduction into avionics systems and, in the event of a system breech, develop capabilities to operate in the presence of the threat. Activities in this area are focused on developing a feature set indicative of deceptive or malicious behavior that will be used in conjunction with machine learning algorithms to detect zero-day attacks on avionics systems. ***FY 2015 Accomplishments:*** N/A ***FY 2016 Plans:*** N/A ***FY 2017 Plans:*** For FY 2015 and FY 2016, the work for this effort was performed in Project 627622, RF Sensors and Countermeasures Tech, under the effort RF Sensor Technologies. Develop deception/malware detection tools for x86-based hardware malware, and expand capability by using file size and instruction frequency to include additional feature sets. The selected feature set will be used in conjunction with existing machine learning algorithms to determine the detection rate and classification accuracy of these algorithms using known malware samples.			
Title: Adaptive Cyber Protections	0.000	0.000	5.747
Description: Develop adaptable and resilient hardware for real-time avionics cyber-attack pattern recognition and mitigation. This activity will take a two-pronged approach to developing adaptable hardware required to support rapid avionics cyber-attack pattern recognition and build self-protecting avionics systems.			

Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force		Date: February 2016
Appropriation/Budget Activity 3600 / 2	**R-1 Program Element (Number/Name)** PE 0602204F / *Aerospace Sensors*	**Project (Number/Name)** 622005 / *Cyber Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
FY 2015 Accomplishments: N/A ***FY 2016 Plans:*** N/A ***FY 2017 Plans:*** For FY 2015 and FY 2016, the work for this effort was performed in Project 627622, RF Sensors and Countermeasures Tech, under the effort RF Sensor Technologies. This will investigate the use of evolvable hardware to perform pattern recognition. Demonstrate whether evolvable hardware in conjunction with evolvable mathematical algorithms can achieve advantage over existing pattern recognition algorithms and are applicable to avionics cyber protections.			
Accomplishments/Planned Programs Subtotals	0.000	0.000	10.200

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

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.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force			Date: February 2016
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602204F / *Aerospace Sensors*	Project (Number/Name) 626095 / *Sensor Fusion Technology*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
626095: *Sensor Fusion Technology*	-	24.037	27.359	35.322	0.000	35.322	35.655	36.262	37.044	37.544	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project develops the technologies required to perform management and fusion of sensor information for timely, comprehensive situational awareness, automatic target recognition, integrated fire control, and bomb damage assessment. This project determines the feasibility of technologies and concepts for fire control that help to precisely locate, identify, and target airborne and surface targets. The project emphasizes finding reduced signature targets and targets of opportunity. It will enable new covert tactics for successful air-to-air and air-to-surface strikes. This project also develops the technologies required to create trusted autonomic, distributed, collaborative, and self-organizing sensor systems that provide anticipatory and ISR, situational awareness, and decision support for multi-layered sensing. This program provides the technologies for: 1) trusted sensors and trusted sensor systems that will deter reverse engineering and exploitation of our critical hardware and software technology and impede unwanted technology transfer, alteration of system capability, and prevent the development of countermeasures to U.S. systems; 2) collaborative tasking of our own distributed heterogeneous sensor networks across a region and co-opted tasking of both traditional and non-traditional adversary sensors; 3) secure sensor web backbone technologies, sensor web physical topologies, and related protocols to assure reliable trusted sensor interactions; and 4) defining architectures for distributed trusted collaborative heterogeneous sensor systems and semantic sensor networks, developing new methodologies for system of systems sensor engineering and analysis, and new techniques for sensor network situation awareness and predictive analytics.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Title: Automatic Target Recognition Technologies	10.051	0.000	0.000
Description: Develop automatic target recognition (ATR), sensor management, and sensor fusion technologies for target detection, tracking, and identification in ISR, and combat identification applications. ***FY 2015 Accomplishments:*** Developed advanced object recognition methods which correlate data from multiple sensors from air, space and cyber domains. Continued to assess and enhance physics-based techniques to meet the autonomous target detection and identification, sensor management, and sensor fusion requirements for intelligence, surveillance, and reconnaissance applications, combat identification applications, and Planning and Direction, Collection, Processing and Exploitation, Analysis and Production, and Dissemination - Experimentation (PCPAD-X) applications in contested and uncontested environments. Continued to assess and develop capabilities to represent and utilize sensor parameters and errors to improved fused geo-location accuracy. ***FY 2016 Plans:*** In FY 2016 and beyond, work accomplished under this effort will be reported under the effort Distributed Sensing for ATR. ***FY 2017 Plans:*** N/A			
Title: Target Signature Modeling	4.080	3.814	4.919

Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force		Date: February 2016
Appropriation/Budget Activity 3600 / 2	**R-1 Program Element (Number/Name)** PE 0602204F / *Aerospace Sensors*	**Project (Number/Name)** 626095 / *Sensor Fusion Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Description: Develop, evaluate, and demonstrate target signature models to support sensor exploitation algorithm development and testing for reconnaissance and strike mission applications. ***FY 2015 Accomplishments:*** Continued development of all-source target models for emerging threat systems in contested environments. Created and assessed methods for validating all-source signature models. Continued to mature target signature models for signature exploitation of multi-spectral systems and signals intelligence sensors. Matured promising approaches to develop a single target model for application to all parts of the spectrum. ***FY 2016 Plans:*** Continue development of all-source target models for emerging threat systems in contested environments. Demonstrate maturing methods for validating all-source signature models. Continue maturing promising approaches to develop a single target model for application to all parts of the spectrum. Develop ground clutter modeling and reduced feature-set target signature prediction techniques for radio frequency sensors. Initiate controlled data collections and high resolution feature database for emerging sensors. Initiate implementation of advanced theoretical approaches to salient feature extraction from limited sensor data. ***FY 2017 Plans:*** Continue development of all-source target models for emerging threat systems in contested environments. Demonstrate maturing methods for validating all-source signature models. Improve efficient target modeling representation to enable more rapid model development and reduce database storage requirements. Demonstrate ground clutter modeling and reduced feature-set target signature prediction techniques for radio frequency sensors. Continue controlled data collections and high resolution feature database for emerging sensors. Continue advanced theoretical approaches to salient feature extraction from limited sensor data.			
Title: Sensor Exploitation Technologies ***Description:*** Develop technical methods required for algorithm performance models, performance driven sensing, layered sensing and other sensing and exploitation technologies impacted by automated exploitation capabilities. ***FY 2015 Accomplishments:*** Developed novel techniques for analysis of large sensor data sets to discover, characterize, and identify threatening activities in contested environments. Continued development of sensor resource optimization enablers for autonomous sensor employment. Continued development and validation of performance models for sensor exploitation technologies. Demonstrate application of sensor and algorithm performance models in the PCPAD-X integrative and virtual environments. Continued to enhance development of an integrated, unified ATR methodology through industry and university outreach. ***FY 2016 Plans:***	6.500	5.817	7.504

Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force		Date: February 2016
Appropriation/Budget Activity 3600 / 2	**R-1 Program Element (Number/Name)** PE 0602204F / *Aerospace Sensors*	**Project (Number/Name)** 626095 / *Sensor Fusion Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Initiate analysis of sensor data where the transmitter and receiver are from distinct platforms or sensing devices. Develop and assess techniques for near real time extraction, representation, and analysis of multi-dimensional information from image sequences. Continue development of novel techniques for analysis of large sensor data sets to discover, characterize, and identify threatening activities in contested environments. Continue to demonstrate application of sensor and algorithm performance models in PCPAD-X. Continue to enhance development of an integrated, unified ATR methodology through industry and university outreach. ***FY 2017 Plans:*** Continue analysis of sensor data where the transmitter and receiver are from distinct platforms or sensing devices. Develop and assess techniques for near real time extraction, representation, and analysis of multi-dimensional information from image sequences. Continue development of novel techniques for analysis of large sensor data sets to discover, characterize, and identify threatening activities in contested environments. Develop target classification techniques through deep learning methods and state of the art neural network methods.			
Title: Trusted Sensing Technologies ***Description:*** Develop, evaluate, and demonstrate methodologies, techniques, and strategies to instill trust in distributed, heterogeneous sensing systems within air, space, and cyber domains. ***FY 2015 Accomplishments:*** Initiated research in trusted exploitation algorithms and tools for PC-PAD, defining and quantifying metrics. Built upon previous work in PCPAD-X to research application of trust metrics in the evaluation of COTS, GOTS, and contractor owned exploitation algorithms and tools to assure the mission. ***FY 2016 Plans:*** In FY 2016 and beyond, work accomplished under this effort will be reported under the effort Sensor Management for ATR. ***FY 2017 Plans:*** N/A	3.406	0.000	0.000
Title: Sensor Management for ATR ***Description:*** Develop multi-platform and multi-sensor control strategies to create advantages for survival, autonomous sensing, and autonomous exploitation in contested environments. Incorporate sensing platform kinematics and external operating conditions into analyses of effective multi-sensor control and multiple intelligence (multi-INT) data fusion capabilities. Assess advantages of multi-sensor closed loop control techniques for platform survival, command and control, ISR, and strike missions. Enhance existing ATR sensor management, and sensor fusion technologies by application of multi-sensor data and distributed data processing.	0.000	13.861	17.910

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
FY 2015 Accomplishments: N/A ***FY 2016 Plans:*** For FY15, the work for this effort was performed under the effort Trusted Sensing Technologies. Develop exploration of multi-sensor inference and control approaches for autonomous operations. Develop metrics for assessing multi-sensor control techniques with regard to assured threat avoidance and optimal sensor positioning. Initiate size-weight-power-constrained processing assessment approaches for future platform on-board processing of multi-sensor data. Define and develop multi-sensor performance assessment approaches for inclusion in PCPAD-X. ***FY 2017 Plans:*** Develop exploration of multisensory inference and control approaches for autonomous operations. Develop metrics for assessing multi-sensor control techniques with regard to assured threat avoidance and optimal sensor positioning. Initiate size-weight-power constrained processing assessment approaches for future platform on-board processing of multi-sensor data. Develop joint inference and control methods for challenging autonomous sensor operations management.			
Title: Distributed Sensing for ATR ***Description:*** Develop techniques and metrics for adaptive, penetrating, distributed RF exploitation in contested environments. ***FY 2015 Accomplishments:*** N/A ***FY 2016 Plans:*** For FY15, the work for this effort was performed under the effort Automatic Target Recognition Technologies. Develop bi-static phenomenology models. Design new waveforms to exploit bi-static RF phenomenology. Develop a systems theory for incorporating identification (ID) uncertainty in ATR algorithms. Develop distributed exploitation algorithms. Design a closed loop sensor mode controller for adaptive transmit and receive. ***FY 2017 Plans:*** Develop bi-static phenomenology models. Design new waveforms to exploit bi-static RF phenomenology. Develop a systems theory for incorporating ID uncertainty in ATR algorithms. Develop distributed exploitation algorithms. Design a closed -loop sensor mode controller for adaptive transmit and receive.	0.000	3.867	4.989
Accomplishments/Planned Programs Subtotals	24.037	27.359	35.322

Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force		Date: February 2016
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C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

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.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force			Date: February 2016
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602204F / *Aerospace Sensors*	Project (Number/Name) 627622 / *RF Sensors and Countermeasures Tech*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
627622: *RF Sensors and Countermeasures Tech*	-	40.036	59.777	46.791	0.000	46.791	52.013	52.286	53.367	54.063	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project develops and assesses affordable, reliable all weather RF sensing and countermeasure concepts for aerospace applications covering the range of RF sensors including communications, navigation, ISR, and radar, both active and passive, across the air, land, sea, space and cyber domains. This project also develops and evaluates technology for ISR sensors, fire control radars, electronic warfare, integrated radar and electronic warfare systems, and offensive information operations systems. It emphasizes the detection and tracking of surface and airborne targets with RF signatures that are difficult to detect due to reduced radar cross sections, concealment and camouflage measures, severe clutter, or heavy jamming. Techniques exploited include the use of multiple RF phenomenologies, multi-dimensional adaptive processing, advanced waveforms and knowledge-aided processing techniques. This project also develops the RF warning and countermeasure technology for advanced electronic warfare and information operations applications. Specifically, it develops techniques and technologies to detect and counter the communications links and sensors of threat air defense systems and hostile command and control networks. The project also exploits emerging technologies and components to provide increased capability for offensive and defensive RF sensors, including radar warning, RF electronic warfare, and electronic intelligence applications.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Title: Hybrid Sensor Technologies	7.939	12.082	10.329
Description: Develop hybrid sensor solutions to be responsive to needs and detect difficult targets. Develop jam-resistant time, position, and velocity sensors.			
FY 2015 Accomplishments: Matured GPS augmentation technologies that take advantage of distributed platforms relaying Global Navigation Satellite Systems (GNSS) signals and georeferenced real-time imaging to improve GPS accuracy in GPS sparse or denied environments. Developed technologies that expand the ability to incorporate GNSS signals into the Global Positioning System (GPS) user equipment as a means to improve navigation signal reliability and availability.			
FY 2016 Plans: Develop technologies to ensure robust and accurate navigation in GPS contested and denied environments. Mature navigation augmentation and GPS resilience technologies, such as taking advantage of signals of opportunity, as well as environmental sensing, such as vision or magnetic sensors, to improve inertial measurement unit aided navigation accuracy in GPS sparse or denied environments.			
FY 2017 Plans: Provide a robust simulation environment to validate GPS receiver operation in sparse and denied environments to ascertain areas which require additional research to maintain accurate geolocation reporting. Continue to work with allied nations (Australia,			

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Appropriation/Budget Activity 3600 / 2	**R-1 Program Element (Number/Name)** PE 0602204F / *Aerospace Sensors*	**Project (Number/Name)** 627622 / *RF Sensors and Countermeasures Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Canada, and the United Kingdom) to augment GPS capability through the use of GNSS for precise positioning, navigation, and timing information.			
Title: RF Sensor Technologies	11.942	16.016	13.655
Description: Conduct applied research and development for the advancement of passive and active RF sensors; including phenomenology, modeling and simulation, algorithm development, and experimentation. Plan, execute, and maintain state-of-the-art RF sensor research and development facilities. ***FY 2015 Accomplishments:*** Continued research and development of agile waveforms, adaptive spectrum utilization techniques, and electromagnetic forensics sensing of the signal environment for robust adaptive RF sensing in contested spectrums and persistent stand-in RF sensing in denied environments. Continued research and development of RF sensor technology, including: signals intelligence (SIGINT) hardware, algorithms, and techniques, passive radar techniques, and advanced receive array antenna technology with wideband and high dynamic range, for passive multimode radars and efficient combat identification capabilities. ***FY 2016 Plans:*** Initiate research on fully polarimetric bistatic RF ground target and clutter phenomenology and relevant ground vehicle dynamics for RF sensing. Continue research and development of RF sensor technologies, including antennas, electromagnetic structures, propagation in plasma medium, electromagnetic modeling & simulation, and prototype experimentation for efficient combat identification capabilities. Develop agile, spectrally efficient, radar waveforms and robust distributed sensing techniques for dominance in non-traditional RF environments. Initiate development of electromagnetics forensics techniques for passive RF sensing and EW applications. ***FY 2017 Plans:*** For FY17 and beyond, advanced cyber technology development research under this effort will be reported in Project 622005, Cyber Technology, under efforts Malware Detection and Adaptive Cyber Protections. Continue research and development of fully polarimetric persistent representation of critical mobile targets and bistatic phenomenology with realistic low grazing angle. Develop electromagnetics based modelling, simulation, and measurement tools for propagation, scattering, and radiation application to improve RF sensors capabilities. Continue development of agile, spectrally efficient, radar waveforms and robust distributed sensing techniques for dominance in non-traditional RF environments. Continue development of advanced electromagnetic forensics techniques for passive RF and EW applications.			

Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Continue to explore novel and advanced sensing technologies for use in demanding environments for future platform capability. Develop methods to electronically attack passive sensing systems used by red forces to degrade this capability.			
Title: Optimize RF Sensing Technology ***Description:*** Develop technology to reduce size, weight, and power of RF sensors. Develop technology to enable affordable upgrades and optimally control RF and multi-intelligence sensors. ***FY 2015 Accomplishments:*** Conducted Electro-Magnetic/Electronic Warfare Battle Management (EM/EWBM) research to optimize use of EW assets against current and future integrated air defense systems and RF threats. Identified, developed and integrated improved electronics that reduce cost, size, weight and power of current EW systems to facilitate development of distributed EW jammers/sensor systems. Developed new approaches to protection of aircraft avionics systems and on-board data networks. ***FY 2016 Plans:*** In FY 2016 and beyond, work accomplished under this effort will be reported under the effort Sensor Resource Management. ***FY 2017 Plans:*** N/A	5.195	0.000	0.000
Title: Multi-Band/Multi-Beam Technologies ***Description:*** Develop multi-band and multi-beam forming technologies. Address technologies for antenna array operations in dynamic sensor networks. ***FY 2015 Accomplishments:*** Identified advanced RF/EO subsystem concepts to refine and update trade space capability. Completed the Multiple-Input Multiple-Output (MIMO) and waveform-diverse models for system and system of systems analysis. Initiated concept exploration for highly integrated, mostly digital microsystems for reconfigurable and tunable capabilities. ***FY 2016 Plans:*** Continue research in advanced RF/EO subsystem concepts to support expendable RF systems configurations. Develop and demonstrate concepts to support expendable RF ISR sensors (Radar, SIGINT, Electronic Support, and Combat ID). Develop conformal RF antenna concepts from C Band to Ka-Band. Develop advanced geo-location algorithms for single and multiple platform operations. Continue research in highly integrated digital microsystems for reconfigurable and tunable capabilities. ***FY 2017 Plans:*** Develop test-bed vehicle for static and dynamic testing of RF/EO sensors and algorithms. Continue research and development of conformal RF antenna concepts from C-Band to Ka-Band. Expand concepts to support expendable RF ISR sensors (Radar,	5.616	10.928	9.342

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
SIGINT, Electronic Support, and Combat ID), demonstrate these capabilities for next-generation attritable platforms, and continue development of advanced geo-location algorithms for single and multiple platform operations. Continue research in highly integrated digital microsystems for reconfigurable and tunable capabilities. In conjunction with development of multi-band, multi-beam technology for sensing capability, develop methods to detect use of this technique and countermeasures to mitigate its use for sensing blue force platforms.			
Title: Counter RF Threat Technologies ***Description:*** Develop aerospace platform jamming technologies and techniques to counter advanced radio-frequency (RF) threats associated with current and future aerospace weapons systems. ***FY 2015 Accomplishments:*** Developed multi-faceted approaches to countering RF threats. Efforts included development of machine learning, autonomous systems to identify frequency agile and changing waveforms. Developed counter-countermeasures to digital radio frequency memory (DRFM) based jammers. Developed EM/EWBM tools,and distributed EW techniques to counter state-of-the-art integrated air defense systems. Developed novel disruptive technologies that leverage cyber, directed energy, and machine learning to counter RF, EO/IR threats. ***FY 2016 Plans:*** For FY 2016 and beyond, work accomplished under this effort will be reported under the effort Sensor Resource Management. ***FY 2017 Plans:*** N/A	9.344	0.000	0.000
Title: Sensor Resource Management ***Description:*** Develop technology to enable optimization of sensor resources in contested environments on own-ship and multi-ship in manned, unmanned and manned/unmanned teaming concepts. ***FY 2015 Accomplishments:*** N/A ***FY 2016 Plans:*** For FY 2015, the work for this effort originally was performed under the efforts, Optimize RF Sensing Technology and Counter RF Threat Technologies.	0.000	15.751	13.465

Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force		Date: February 2016
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Develop distributed sensor management techniques utilizing an Open Mission Systems (OMS) context and Service Oriented Architecture (SOA) common set of messages and data models. Use Electronic Warfare and Communications as first functional disciplines to initiate SOA constructs. Initiate layered effects analyses on next generation RF based threats, counters and perform vulnerability assessments. Initiate operational architecture and mission services through common mission control center constructs. Continue research of advanced Electronic Support (ES) concepts and exploration of adaptable Electronic Attack (EA) EA/ES capabilities. ***FY 2017 Plans:*** Initiate development of additional functional disciplines (radar, EO/IR, High Energy Laser) in the SOA and sensor resource optimization. Initiate bandwidth efficient communication protocol research to support collaborative state estimation techniques to enable common model referencing for positioning navigation and timing (PNT) in GPS denied environments. Conduct electro-magnetic/electronic warfare (EW) battle management optimization service research on electronic attack (EA) and electronic support (ES) and asses against current and future integrated air defense systems and RF threats. Develop robust modeling and simulation capability to study the efficiency versus effectiveness of distributed electronic warfare assets. Continue research into effective management of electronic warfare assets in operational environments focusing on a multi-ship strike package employment. Refine and augment open mission standards (OMS) to facilitate electronic warfare capability. Solidify protocol messaging to enable introduction of new technologies into avionics systems without encroaching on platform flight certification.			
Accomplishments/Planned Programs Subtotals	40.036	54.777	46.791

	FY 2015	FY 2016
Congressional Add: Program Increase	-	5.000
FY 2016 Plans: Conduct Congressionally directed effort		
Congressional Adds Subtotals	-	5.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force		Date: February 2016
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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.