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Exhibit R-2, RDT&E Budget Item Justification: PB 2016 Air Force **Date:** February 2015

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 6: RDT&E Management Support</i>					R-1 Program Element (Number/Name) PE 0604256F / <i>Threat Simulator Development</i>							
COST (\$ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
Total Program Element	-	14.786	24.418	23.844	-	23.844	21.846	22.251	22.641	23.045	Continuing	Continuing
662907: <i>Electronic Combat Intel Support</i>	-	1.558	2.631	3.196	-	3.196	2.506	2.564	2.599	2.645	Continuing	Continuing
663321: <i>Electronic Warfare Ground Test Resources</i>	-	9.451	13.188	12.675	-	12.675	12.254	12.475	12.680	12.906	Continuing	Continuing
667500: <i>Foreign Materiel Acquisition/Analysis</i>	-	3.777	8.599	7.973	-	7.973	7.086	7.212	7.362	7.494	Continuing	Continuing

A. Mission Description and Budget Item Justification

This PE provides funding for the elements necessary to support the Air Force Electronic Warfare (EW) Test Process, including Directed Energy (DE). This test process provides a scientific methodology to ensure the effective disciplined and efficient testing of EW and avionics systems. Each capability or facility improvement is pursued in concert with the others to avoid duplicate capabilities while at the same time producing the proper mix of test resources needed to support the AF EW Test Process and testing of EW systems which can be used in any action involving the use of electromagnetic and DE to control the electromagnetic spectrum or to attack the enemy. This PE provides funding for the management and technical oversight of implementation activities, development and improvement of digital EW models, measurement facilities improvements, hardware-in-the-loop test facilities improvements, and installed system test facility improvements. Support includes requirements definition and analysis, project planning, programming and budgeting, technical oversight, and application of T&E facility Improvement & Modernization (I&M). Products include studies, analyses, improved Modeling & Simulation (M&S) of threat sources, improved or new T&E capabilities to support EW testing and related documentation. Additionally, this PE provides funding to support the acquisition and analysis efforts of the Foreign Materiel Program and EW intelligence efforts.

This program is in Budget Activity 6, RDT&E Management Support because this budget activity includes research, development, test and evaluation efforts and funds to sustain and/or modernize the installations or operations required for general research, development, test and evaluation.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2016 Air Force				Date: February 2015	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
3600: Research, Development, Test & Evaluation, Air Force I BA 6: RDT&E Management Support		PE 0604256F I Threat Simulator Development			
B. Program Change Summary (\$ in Millions)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Previous President's Budget	14.841	24.418	24.003	-	24.003
Current President's Budget	14.786	24.418	23.844	-	23.844
Total Adjustments	-0.055	-	-0.159	-	-0.159
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.055	-			
• Other Adjustments	-	-	-0.159	-	-0.159

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2016 Air Force										Date: February 2015		
Appropriation/Budget Activity 3600 / 6					R-1 Program Element (Number/Name) PE 0604256F / Threat Simulator Development				Project (Number/Name) 662907 / Electronic Combat Intel Support			
COST (\$ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
662907: Electronic Combat Intel Support	-	1.558	2.631	3.196	-	3.196	2.506	2.564	2.599	2.645	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
This project provides funding to support Foreign Materiel Operational Test and Evaluation (FMOT&E), which ensures the ability of operational commands to test and develop effective Electronic Attack/Electronic Protection (EA/EP) techniques and tactics. Funds are required for: deployment of systems to test facilities; travel of personnel to the test sites to evaluate and validate test results; range and laboratory costs; test consumables; costs for instrumentation of systems; and contracted engineering support for the conduct of tests and subsequent reporting. Funding for this program is required to prevent future aircraft losses due to improper and inaccurate aircrew tactics (e.g., lack of evasive action or proper tactics training to avoid missile attack).												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2014	FY 2015	FY 2016	
Title: FMOT&E									1.558	2.631	3.196	
Description: Supports Foreign Materiel Operational Test and Evaluation (FMOT&E)												
FY 2014 Accomplishments: Continued to conduct foreign materiel operational analysis (FMOA) for fighter and bomber testing; mobility/special operations transport/helicopter testing; classified operational assessments; and extensive evaluations and reporting of system effectiveness.												
FY 2015 Plans: Continue to conduct foreign material operational analysis (FMOA) for fighter and bomber testing; mobility/special operations transport/helicopter testing; classified operational assessments; and extensive evaluations and reporting of system effectiveness.												
FY 2016 Plans: Continue to conduct foreign material operational analysis (FMOA) for fighter and bomber testing; mobility/special operations transport/helicopter testing; classified operational assessments; and extensive evaluations and reporting of system effectiveness.												
Accomplishments/Planned Programs Subtotals									1.558	2.631	3.196	
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost	
• RDTE: BA 06: PE 0605807F: Test and Evaluation Support	724.958	689.509	673.908	-	673.908	666.993	677.220	684.977	697.626	Continuing	Continuing	

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Air Force										Date: February 2015		
Appropriation/Budget Activity 3600 / 6				R-1 Program Element (Number/Name) PE 0604256F / Threat Simulator Development				Project (Number/Name) 662907 / Electronic Combat Intel Support				
C. Other Program Funding Summary (\$ in Millions)												
	<u>Line Item</u>	<u>FY 2014</u>	<u>FY 2015</u>	<u>FY 2016</u> <u>Base</u>	<u>FY 2016</u> <u>OCO</u>	<u>FY 2016</u> <u>Total</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
<u>Remarks</u>												
D. Acquisition Strategy												
Not applicable.												
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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Exhibit R-2A, RDT&E Project Justification: PB 2016 Air Force										Date: February 2015		
Appropriation/Budget Activity 3600 / 6					R-1 Program Element (Number/Name) PE 0604256F / Threat Simulator Development				Project (Number/Name) 663321 / Electronic Warfare Ground Test Resources			
COST (\$ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
663321: Electronic Warfare Ground Test Resources	-	9.451	13.188	12.675	-	12.675	12.254	12.475	12.680	12.906	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The AF requires a comprehensive set of test facilities to implement the Air Force Electronic Warfare (EW) Test Process in order to test EW systems, including Directed Energy (DE). To manage program risk effectively throughout the weapons system acquisition process, and conduct T&E effectively and efficiently, a broad multi-spectrum, integrated set of T&E capabilities for modeling and simulation through open-air ranges (OAR) is required. The EW Test Process Support task provides for investment management, coordinated technical oversight, and application of EW T&E facilities, including studies, analyses, and related documentation. The National Radar Cross Section (RCS) Test Facility (NRTF) at Holloman AFB, NM, provides timely, accurate, and secure RCS and antenna measurements for tri-service and joint program offices, DoD laboratories, Defense Advanced Research Projects Agency (DARPA) and industry. The NRTF tests fielded and developmental systems and technologies to meet Low Observable (a.k.a. stealth) and EW customer requirements. The Guided Weapons Evaluation Facility (GWEF), 412 EWG/OL-HN and the Digital Integrated Air Defense System (DIADS) provide the ability to realistically evaluate hardware components and simulated weapon systems against manned hardware threat representations throughout the acquisition process. GWEF and 412 EWG/OL-HN provide simulations of advanced Infrared (IR) & Radio Frequency (RF) semi-active Surface-to-Air Missiles (SAMs), Air-to-Air Missiles (AAMs), RF missile warning, IR and Laser countermeasure functions; integration of actual threat hardware and ground clutter into advanced threat RF and IR missile simulations. DIADS provides algorithm based enemy command and control (C2) capabilities plus early warning radar detection, limited ground control intercept features and also allows man-in-the-loop interaction for the enemy C2 positions. The Advanced Warfare Test and Evaluation Capability (AWTEC) will replace 90's technology with state-of-the-art stimulators to upgrade the Benefield Anechoic Facility (BAF) at Edwards AFB, CA and provides Electromagnetic Interference/Electromagnetic Compatibility (EMI/EMC) capabilities at the BAF. Improvement and modernization efforts within this PE are identified for the EW mission area. EW provides planning, improvements, and modernization needed for test capabilities to conduct and support the AF EW test process, including DE. This test process provides a scientific methodology to ensure the effective disciplined and efficient testing of EW and avionics systems.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2014	FY 2015	FY 2016
Title: I&M	8.707	11.606	11.030
Description: Provides for planning and improvement & modernization (I&M) of test capabilities to conduct and support the AF EW test process, including DE.			
FY 2014 Accomplishments: The 412 EWG/OL-HN continued RF threat simulator reconstitution and completed checkouts for approximately 25% of the delivered RF threat simulator systems. The GWEF at the 96 TW brought the 9-axis Infrared (IR) Flight Motion Simulator (FMS) up to functional status completing development and calibration efforts. The 96 TW began IR simulator software improvements and upgraded system hardware and interfaces to the IR developmental test lab. The Digital Integrated Air Defense System (DIADS)			

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Air Force		Date: February 2015	
Appropriation/Budget Activity 3600 / 6	R-1 Program Element (Number/Name) PE 0604256F / <i>Threat Simulator Development</i>	Project (Number/Name) 663321 / <i>Electronic Warfare Ground Test Resources</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2014	FY 2015
<p>fielded a new software release which improved tracker capability and scenario preparation. DIADS also continued development of advanced jamming capabilities and improved weapon command and control algorithms, and validated architecture and simulation upgrades to advance new capabilities to simulate evolving threats. The Advanced Warfare Test & Evaluation Capability (AWTEC) completed Benefield Anechoic Facility (BAF) upgrades providing Electromagnetic Interference/Electromagnetic Compatibility (EMI/EMC) test capabilities in the high and low frequency bands and integration of new test control and RF monitoring systems. AWTEC continued development of Identify Friend or Foe (IFF) software, Advanced Global Navigation System upgrades for the BAF, and awarded a contract to begin upgrading the BAF advanced threat signal generation capabilities to support F-35 and other aircraft platform testing. AWTEC procured free space carts and continued development and integration of a follow-on Advanced Radar Environment Simulation (ARES) build. The National Radar Cross Section (RCS) Test Facility (NRTF) completed development and procurement of the Radar VHF/UHF Measurement System (RVUMS) Antenna Feed Horn system; initiated development and procurement of a new digital receiver system; procured and implemented a high-power transmitter system; and completed design and construction of a new paint booth facility. NRTF also continued upgrades of the machine/supply shops facilities, and initiated modularity studies to improve system efficiency and accuracy studies to improve system sensitivity and resolution.</p> <p>FY 2015 Plans: The 96 TW will continue development of IR threat simulator capabilities to include hardware and software upgrades to the IR developmental test lab and the 5-axis test areas. The 96 TW will initiate efforts to develop and integrate a new Ultraviolet (UV) projection capability into the 5-axis test areas. DIADS will continue software conversion to C++ and design, development, architecture validation and simulation upgrades to advance new capabilities to simulate evolving threats, including improvements to command and control models, Electronic Attack/Electronic Protection (EA/EP), and advanced threat tracking capabilities. AWTEC will continue development and procurement of BAF advanced threat signal generation capabilities to support F-35 and other aircraft platform testing. AWTEC will also continue development and integration of Identify Friend or Foe (IFF) software, an Advanced Global Navigation System upgrade, and complete the follow-on ARES build for the BAF. NRTF will complete upgrades to the machine/supply shops and take delivery of a new digital receiver system. NTRF will also complete studies to consolidate and enhance efficiency of operations and accuracy for measuring RCS of Low Observable platforms and antennas, and continue facility upgrades including relocation and refurbishment of a 40-foot in-ground turntable used to support full size fighter class platform testing.</p> <p>FY 2016 Plans: The 96 TW will continue development of hardware and software upgrades to 5-axis IR threat simulator capabilities. DIADS will continue software conversion to C++ and develop and validate architecture and simulation upgrades supporting advanced threat simulation capabilities, including improvements to command and control, sensor reactivity, and jamming models. AWTEC will continue development, procurement and integration of new state-of-the-art BAF stimulators and threat signal generation capabilities. NRTF will continue facility upgrades to consolidate and enhance operations efficiency and improve RCS</p>			

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Appropriation/Budget Activity 3600 / 6				R-1 Program Element (Number/Name) PE 0604256F / Threat Simulator Development				Project (Number/Name) 663321 / Electronic Warfare Ground Test Resources			
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2014	FY 2015	FY 2016
measurement accuracy of Low Observable platforms and antennas, including design studies of next generation radar and RCS metrology requirements.											
Title: EC Test Process Support									0.744	1.582	1.645
Description: Electronic Combat (EC) Test Process Support. Conduct requirements analyses and other studies in support of Air Force T&E investments in test infrastructure and capabilities.											
FY 2014 Accomplishments: Continued to provide SETA support needed to implement planned Air Force test processes and infrastructure I&M capabilities. Team members continued support to tri-service monitoring and analysis teams established to identify emerging joint investment needs and requirements development. Team members helped manage and monitor I&M program elements and activities.											
FY 2015 Plans: Continue to provide SETA support needed to implement planned Air Force test processes and infrastructure I&M capabilities. Team members will continue support to tri-service monitoring and analysis teams established to identify emerging joint investment needs and requirements development. Team members will help manage and monitor I&M program elements and activities.											
FY 2016 Plans: Continue to provide SETA support needed to implement planned Air Force test processes and infrastructure I&M capabilities. Team members will continue support to tri-service monitoring and analysis teams established to identify emerging joint investment needs and requirements development. Team members will help manage and monitor I&M program elements and activities.											
Accomplishments/Planned Programs Subtotals									9.451	13.188	12.675
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
• RDTE: BA 06: PE 0604759F: Major T&E Investment	31.423	47.232	68.302	-	68.302	66.845	66.142	66.436	67.679	Continuing	Continuing
• RDTE: BA 06: PE 0605807F: Test and Evaluation Support	724.958	689.509	673.908	-	673.908	666.993	677.220	684.977	697.626	Continuing	Continuing
• RDTE: BA 06: PE 0605976: Facility Restoration & Modernization - T&E	44.160	46.955	40.518	-	40.518	42.978	43.795	44.349	45.142	Continuing	Continuing

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C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
• RDTE: BA 06: PE 0605978F: <i>Facilities Sustainment - T&E Support</i>	29.743	32.965	27.895	-	27.895	28.372	28.914	29.374	29.900	Continuing	Continuing
Remarks											
D. Acquisition Strategy											
NA											
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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Appropriation/Budget Activity 3600 / 6					R-1 Program Element (Number/Name) PE 0604256F / Threat Simulator Development				Project (Number/Name) 667500 / Foreign Materiel Acquisition/ Analysis			
COST (\$ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
667500: Foreign Materiel Acquisition/Analysis	-	3.777	8.599	7.973	-	7.973	7.086	7.212	7.362	7.494	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
This project's specific purpose is to support USAF Foreign Materiel Program requirements through the acquisition and analysis of foreign materiel. Items considered for these Foreign Materiel Acquisition (FMA) funds are included in the prioritized Air Force FMA Top 20 list established each year. Each Major Command (MAJCOM) prepares and approves a Foreign Materiel - Mission Requirements Statement for each requirement. Annually, the MAJCOM commanders establish a list of their top 20 requirements. The MAJCOMs' requirements lists are integrated and prioritized into a classified Air Force requirement list. Each MAJCOM then approves the FMA Top 20 List and final validation comes from the Air Force Vice Chief of Staff. System analyses are based on and driven by acquisitions. The USAF provides assessments and data for threat systems to all DoD components.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2014	FY 2015	FY 2016	
Title: FMP									3.777	8.599	7.973	
Description: Supports USAF Foreign Materiel Program (FMP) Requirements through the acquisition and analysis of foreign materiel.												
FY 2014 Accomplishments: Continued to fund acquisition of available Foreign Materiel in accordance with the prioritized Air Force Foreign Materiel List; analysis of acquired Foreign Materiel; and operations and maintenance of the specialized Foreign Materiel assets.												
FY 2015 Plans: Continue to fund acquisition of available Foreign Materiel in accordance with the prioritized Air Force Foreign Materiel List; analysis of acquired Foreign Materiel; and operations and maintenance of the specialized Foreign Materiel assets.												
FY 2016 Plans: Continue to fund acquisition of available Foreign Materiel in accordance with the prioritized Air Force Foreign Materiel List; analysis of acquired Foreign Materiel; and operations and maintenance of the specialized Foreign Materiel assets.												
Accomplishments/Planned Programs Subtotals									3.777	8.599	7.973	

UNCLASSIFIED

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Appropriation/Budget Activity 3600 / 6				R-1 Program Element (Number/Name) PE 0604256F / <i>Threat Simulator Development</i>				Project (Number/Name) 667500 / <i>Foreign Materiel Acquisition/ Analysis</i>			
C. Other Program Funding Summary (\$ in Millions)											
			<u>FY 2016</u>	<u>FY 2016</u>	<u>FY 2016</u>					<u>Cost To</u>	
<u>Line Item</u>	<u>FY 2014</u>	<u>FY 2015</u>	<u>Base</u>	<u>OCO</u>	<u>Total</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>Complete</u>	<u>Total Cost</u>
• RDTE: BA 06: PE 0605807F: <i>Test and Evaluation Support</i>	724.958	689.509	673.908	-	673.908	666.993	677.220	684.977	697.626	Continuing	Continuing
Remarks											
D. Acquisition Strategy											
Not applicable.											
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.											