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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Air Force **Date:** February 2016

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>
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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	-	24.318	23.844	21.630	0.000	21.630	22.038	22.426	22.839	23.245	Continuing	Continuing
662907: <i>Electronic Combat Intel Support</i>	-	2.628	3.196	2.481	0.000	2.481	2.540	2.574	2.621	2.668	Continuing	Continuing
663321: <i>Electronic Warfare Ground Test Resources</i>	-	13.091	12.675	12.133	0.000	12.133	12.355	12.560	12.791	13.018	Continuing	Continuing
667500: <i>Foreign Materiel Acquisition/Analysis</i>	-	8.599	7.973	7.016	0.000	7.016	7.143	7.292	7.427	7.559	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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B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	24.418	23.844	21.846	0.000	21.846
Current President's Budget	24.318	23.844	21.630	0.000	21.630
Total Adjustments	-0.100	0.000	-0.216	0.000	-0.216
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	-0.100	0.000	-0.216	0.000	-0.216

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force										Date: February 2016		
Appropriation/Budget Activity 3600 / 6					R-1 Program Element (Number/Name) PE 0604256F / <i>Threat Simulator Development</i>				Project (Number/Name) 662907 / <i>Electronic Combat Intel Support</i>			
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
662907: <i>Electronic Combat Intel Support</i>	-	2.628	3.196	2.481	0.000	2.481	2.540	2.574	2.621	2.668	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 2015	FY 2016	FY 2017
Title: FMOT&E	2.628	3.196	2.481
Description: Supports Foreign Materiel Operational Test and Evaluation (FMOT&E)			
FY 2015 Accomplishments: Conducted 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.			
FY 2017 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	2.628	3.196	2.481

C. Other Program Funding Summary (\$ in Millions)

Line Item	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
• RDTE: BA 06: PE 0604759F: <i>Major T&E Investment</i>	45.985	73.302	66.385	0.000	66.385	65.706	66.001	67.265	68.464	Continuing	Continuing

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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) 662907 / <i>Electronic Combat Intel Support</i>			

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2015	FY 2016	FY 2017	FY 2017	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	Cost To	
			Base	OCO	Total					Complete	Total Cost
• RDTE: BA 06: PE 0605807F: <i>Test and Evaluation Support</i>	691.977	683.308	661.417	0.000	661.417	672.180	680.576	693.772	706.945	Continuing	Continuing
• RDTE: BA 06: PE 0605976F: <i>Facility Restoration and Modernization - T&E</i>	46.955	40.518	134.111	0.000	134.111	135.116	125.388	89.071	69.807	Continuing	Continuing
• RDTE: BA 06: PE 0605978F: <i>Facility Sustainment - T&E Support</i>	32.965	27.895	28.091	0.000	28.091	28.637	29.093	29.633	30.158	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.

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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) 663321 / <i>Electronic Warfare Ground Test Resources</i>			
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
663321: <i>Electronic Warfare Ground Test Resources</i>	-	13.091	12.675	12.133	0.000	12.133	12.355	12.560	12.791	13.018	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 (M&S) 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) semi-active Surface-to-Air Missiles (SAMs), Air-to-Air Missiles (AAMs), IR and Laser countermeasure functions; integration of actual threat hardware and ground clutter into advanced threat 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 2015	FY 2016	FY 2017
Title: I&M	11.606	11.103	10.503
Description: Provides for planning and improvement & modernization (I&M) of test capabilities to conduct and support the AF EW test process, including DE.			
FY 2015 Accomplishments:			
The 96 TW continued 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 completed initial installation of hardware and software into the developmental test lab, including the integration of nine IR threats (software only). DIADS continued software conversion to C++ and design, development, architecture validation and simulation upgrades to simulate evolving threats, including improvements to			

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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) 663321 / <i>Electronic Warfare Ground Test Resources</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2015	FY 2016	FY 2017
<p>command and control models, Electronic Attack/Electronic Protection (EA/EP), and advanced threat tracking capabilities. AWTEC continued development and procurement of advanced threat signal generation capabilities for the BAF to support F-35 and other aircraft platforms. AWTEC completed verification and validation testing of the Advanced Global Navigation System, acceptance testing of a new EMI/EMC test capability, and began design, development, and integration of significant upgrades to the BAF threat signal generation system - Combat Electromagnetic Environment Simulator (CEESIM). NRTF completed upgrades to the machine/supply shops and the insertion of an X and Ku band sensitivity capability. NTRF also completed studies to consolidate and enhance efficiency of operations and accuracy for measuring the RCS of Low Observable platforms and antennas, and has begun initial ground preparation for facility upgrades and the relocation and refurbishment of the 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, as well as the development and the transition of the developmental test lab to operational capability. DIADS will continue software conversion to C++ and develop and validate architecture and simulation upgrades, including improvements to command and control, sensor reactivity, and jamming models. AWTEC will continue development, procurement and integration of new state-of-the-art stimulators, CEESIM enhancements and modifications, instrumentation, and environment monitoring and measuring capabilities for the BAF. NRTF will continue facility upgrades to consolidate and enhance operations efficiency and improve the RCS measurement accuracy of Low Observable platforms and antennas, including completing the construction of the Research Diagnostic and Integration (REDI) range.</p> <p>FY 2017 Plans: The 96 TW will continue development of hardware and software upgrades to 5-axis IR threat simulator capabilities. DIADS will continue to develop and validate architecture and simulation upgrades, including improvements to command and control, sensor reactivity, and jamming models. AWTEC will continue development, procurement and integration of new state-of-the-art stimulators and threat signal generation capabilities for the BAF. NRTF will continue facility upgrades to consolidate and enhance operations efficiency and improve RCS measurement accuracy of Low Observable platforms and antennas, including design studies of next generation radar and RCS metrology requirements.</p>				
<p>Title: EC Test Process Support</p> <p>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.</p> <p>FY 2015 Accomplishments:</p>		1.485	1.572	1.630

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2015	FY 2016	FY 2017
<p>Provided 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.</p> <p>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.</p> <p>FY 2017 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.</p>			
Accomplishments/Planned Programs Subtotals	13.091	12.675	12.133

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u> <u>Base</u>	<u>FY 2017</u> <u>OCO</u>	<u>FY 2017</u> <u>Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• RDTE: BA 06: PE 0604759F: <i>Major T&E Investment</i>	45.985	73.302	66.385	0.000	66.385	65.706	66.001	67.265	68.464	Continuing	Continuing
• RDTE: BA 06: PE 0605807F: <i>Test and Evaluation Support</i>	691.977	683.308	661.417	0.000	661.417	672.180	680.576	693.772	706.945	Continuing	Continuing
• RDTE: BA 06: PE 0605976: <i>Facility Restoration & Modernization - T&E</i>	46.955	40.518	134.111	0.000	134.111	135.116	125.388	89.071	69.807	Continuing	Continuing
• RDTE: BA 06: PE 0605978F: <i>Facilities Sustainment - T&E Support</i>	32.965	27.895	28.091	0.000	28.091	28.637	29.093	29.633	30.158	Continuing	Continuing

Remarks

D. Acquisition Strategy

NA

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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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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>			
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
667500: <i>Foreign Materiel Acquisition/Analysis</i>	-	8.599	7.973	7.016	0.000	7.016	7.143	7.292	7.427	7.559	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)

Title: FMP	FY 2015	FY 2016	FY 2017
Description: Supports USAF Foreign Materiel Program (FMP) Requirements through the acquisition and analysis of foreign materiel.	8.599	7.973	7.016
FY 2015 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 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.			
FY 2017 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	8.599	7.973	7.016

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C. Other Program Funding Summary (\$ in Millions)

Line Item	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
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Remarks

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