

UNCLASSIFIED

PE NUMBER: 0604256F
 PE TITLE: Threat Simulator Development

Exhibit R-2, RDT&E Budget Item Justification	DATE May 2009
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BUDGET ACTIVITY 06 RDT&E Management Support	PE NUMBER AND TITLE 0604256F Threat Simulator Development
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Cost (\$ in Millions)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost to Complete	Total
Total Program Element (PE) Cost	35.903	34.474	27.789	0.000	0.000	0.000	0.000	0.000	Continuing	TBD
2907 Electronic Combat Intel Support	2.645	2.192	2.206	0.000	0.000	0.000	0.000	0.000	Continuing	TBD
3321 Electronic Warfare Ground Test Resources	26.287	24.491	17.966	0.000	0.000	0.000	0.000	0.000	Continuing	TBD
7500 Foreign Materiel Acquisition/Analysis	6.971	7.791	7.617	0.000	0.000	0.000	0.000	0.000	Continuing	TBD

(U) 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. Test investment activities are also funded through the Technology Insertion & Risk Reduction (TIRR) program. The TIRR program provides funds to study new technologies and test methodologies to determine their feasibility for future test and evaluation (T&E) investment within the scope of this program element. The intent is to reduce risk associated with new technologies and methodologies prior to investing in larger programs. This PE also provides funding for planning, budgetary management, and technical support of the Air Force for corporate-level implementation of the EW Test Process, improvement and modernization (I&M) activities and application of the T&E infrastructure. Support includes requirements definition and analysis, project planning, programming and budgeting, technical oversight, and application of T&E facility I&M. Products include studies, analyses, and related documentation. Additionally, this PE provides funding to support the acquisition and exploitation efforts of the Foreign Materiel Program and EW intelligence efforts.

This PE is in Budget Activity 6, Management Support, because it is a Research and Development (R&D) effort for I&M of T&E capabilities at AF Test Centers.

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(U) **B. Program Change Summary (\$ in Millions)**

	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>
(U) Previous President's Budget	39.639	34.568	38.791
(U) Current PBR/President's Budget	35.903	34.474	27.789
(U) Total Adjustments	-3.736	-0.094	
(U) Congressional Program Reductions			
Congressional Rescissions		-0.094	
Congressional Increases			
Reprogrammings	-3.135		
SBIR/STTR Transfer	-0.601		

(U) **Significant Program Changes:**

FY08 Reprogrammings to Aerospace Vehicle Technologies Program (PE 0602201F) \$.200, Integrated C2 Systems (PE 0604740F) \$1.7, F-22 Program (PE 0207138F), \$1.235

Exhibit R-2a, RDT&E Project Justification

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BUDGET ACTIVITY 06 RDT&E Management Support							PE NUMBER AND TITLE 0604256F Threat Simulator Development		PROJECT NUMBER AND TITLE 2907 Electronic Combat Intel Support	
Cost (\$ in Millions)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost to Complete	Total
2907 Electronic Combat Intel Support	2.645	2.192	2.206	0.000	0.000	0.000	0.000	0.000	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0		

(U) 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 blue 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 blue 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).

Budget Activity Justification: This Program Element is in Budget Activity 6, Management Support, because it is a Research and Development (R&D) effort for Improvement and Modernization of T&E capabilities at Air Force Test Centers.

(U) B. Accomplishments/Planned Program (\$ in Millions)

	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>
(U) Accomplishments/Planned Program:			
(U) Funds fighter and bomber testing for foreign materiel operational analysis. Extensive evaluations and reporting of blue system effectiveness to be accomplished.	1.635	1.346	1.355
(U) Funds mobility/special operations transport/helicopter testing for foreign materiel operational analysis. Extensive evaluations and reporting of blue system effectiveness to be accomplished.	0.947	0.763	0.768
(U) Funds classified operational assessments for foreign materiel operational analysis. Extensive evaluations and reporting to be accomplished.	0.063	0.083	0.083
(U) Total Cost	2.645	2.192	2.206

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

	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Complete</u>							
(U) Other APPN None.										

(U) D. Acquisition Strategy

Not applicable.

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BUDGET ACTIVITY		PE NUMBER AND TITLE						PROJECT NUMBER AND TITLE		
06 RDT&E Management Support		0604256F Threat Simulator Development						3321 Electronic Warfare Ground Test Resources		
Cost (\$ in Millions)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost to Complete	Total
3321 Electronic Warfare Ground Test Resources	26.287	24.491	17.966	0.000	0.000	0.000	0.000	0.000	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0		

(U) 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 test and evaluation (T&E) effectively and efficiently, a broad multi-spectrum, integrated set of T&E capabilities for modeling and simulation through open-air ranges (OAR) are 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, DARPA and industry. The NRTF tests fielded and developmental systems and technology to meet Low Observable (a.k.a. stealth) and EW customer requirements. The Air Force Electronic Warfare Evaluation Simulator (AFEWES) 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. AFEWES provides 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 Installed Test Integration Program (ITIP) develops a multi-spectral synthetic battlespace with virtual and constructive modeling and simulation T&E capabilities at Edwards AFB, CA. The Air Warfare Mission Simulator (AWMS) program develops an electronic warfare capability with high fidelity reconfigurable cockpits. This program will also provide the capability to link high fidelity cockpits to the information battlespace via High Level Architecture (HLA). Test investment activities are also funded through the Technology Insertion & Risk Reduction (TIRR) program. The TIRR program provides funds to study new technologies and test methodologies to determine their feasibility for future T&E investment within the scope of this program element. The intent is to reduce risk associated with new technologies and methodologies prior to investing in larger programs.

Improvement and modernization efforts within this PE are identified in one mission area category: EW. 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.

Budget Activity Justification: This Program Element is in Budget Activity 6, Management Support, because it is a Research and Development (R&D) effort for Improvement and Modernization of T&E capabilities at Air Force Test Centers.

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BUDGET ACTIVITY 06 RDT&E Management Support	PE NUMBER AND TITLE 0604256F Threat Simulator Development	PROJECT NUMBER AND TITLE 3321 Electronic Warfare Ground Test Resources
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(U) <u>B. Accomplishments/Planned Program (\$ in Millions)</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>
<p>(U) CATEGORY: Electronic Warfare (EW): provides planning, improvements, and modernization needed for test capabilities to conduct and support the Air Force (AF) 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.</p> <p>(U) Air Force Electronic Warfare Evaluation Simulator (AFEWES): This project provides a secure (TS/SAR), Hardware-in-the-Loop (HITL) test capability consisting of high-fidelity Radio Frequency (RF) and Infrared (IR) threat simulators to evaluate the effectiveness of DoD and Allied Electronic Combat (EC) systems in a controlled, ground-based laboratory environment. This project provides simulations of advanced IR and RF semi-active Surface-to-Air Missiles, Air-to-Air Missiles, RF missile warning, IR and Laser countermeasure functions to include the integration of actual threat hardware and ground clutter into advanced threat RF and IR simulations.</p> <p>(U) Digital Integrated Air Defense System (DIADS) Upgrade: This project provides a digital, mission-level threat Integrated Air Defense System (IADS) simulation. The project will upgrade the architecture and add new players to maintain currency with evolving threats, enhancing existing IADS command and control players based on the latest intelligence. The project will incorporate standard, validated DoD radar and surface-to-air missile models. Distributed interfaces will be developed between DIADS and Blue (i.e., friendly) C4ISR simulations to develop a coherent synthetic battlespace for the test and training of multi-platform sensor fusion and net-centric systems programs.</p> <p>(U) Installed Test Integration Program (ITIP): This project will integrate the Avionics Test and Integration Complex (ATIC) Electronic Warfare (EW) test and evaluation resources into a common test environment or synthetic battlespace. The objective is to integrate stand-alone stimulators developed under the Electronic Combat Integrated Test (ECIT) program, the Central Test & Evaluation Investment Program (CTEIP), and the Digital Integrated Air Defense System (DIADS). The project enhances test repeatability, and improves the efficiency for developing and rendering complex, integrated scenarios.</p> <p>(U) Electronic Warfare Test Analysis Tools & Methodology (EWTATM): This project provides for the development, deployment, and advancement of data analysis tools and methodologies to improve efficiency and effectiveness of the Electronic Warfare (EW) Test Process. The project establishes test methodologies and provides tools to standardize data reduction across multiple Test Facilities.</p> <p>(U) Air Warfare Mission Simulator (AWMS): This project provides two TS/SAR modeling & simulation facilities including two reconfigurable high fidelity manned flight simulators with full mission level simulation. It adds EW, sensor, and weapons capability to the simulators, provides for internal and external linking, and interoperable tools to run distributed simulations in multi-ship formations for test & evaluation of aircraft such as the F-35 and F-16.</p>	25.176	23.126	16.819

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(U) <u>B. Accomplishments/Planned Program (\$ in Millions)</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>
(U) Advanced Warfare Test and Evaluation Capability (AWTEC): This project will provide the Avionics Test & Integration Complex (ATIC) with a suite of stimulators designed to replace 90's technology with state of the art equipment. Increased memory and processing speeds, along with external interface upgrades will allow significant improvement in RF signal fidelity and IR/UV scene generation. This project will provide a robust linking capability for joint warfighting and interoperability testing, and additional Blue C4ISR signals and links. This project will also integrate the test capabilities developed under on-going CTEIP programs such as the Advanced Communications Environment, and Next Generation Electronic Warfare Environment Generator.			
(U) NRTF Upgrades: Enhance efficiency of operations and accuracy of Low Observable and antenna measurements. Continue investments to incentivize RCS test ranges to consolidate their workload to the NRTF. Continue RCS measurement enhancements to advance radar, range and target positioning capabilities; provide greater measurement sensitivity and dynamic range, increase bandwidth to address emerging radar and EW threats; increase data product quality and throughput.			
(U) Technology Insertion & Risk Reduction (TIRR) program: The TIRR program provides funds to study new technologies and test methodologies to determine their feasibility for future T&E investment within the scope of this program element. The intent is to reduce risk associated with new technologies and methodologies prior to investing in larger programs. TIRR activities will be incorporated into future programs beginning FY 2012 and will not be a separate line item.	0.000	0.218	
(U) Electronic Combat (EC) Test Process Support. Conduct requirements analyses and other studies in support of Air Force investments in EW test infrastructure. Provide Systems Engineering / Technical Assistance (SETA) support for Air Force implementation of the EW Test Process, including I&M of the EW test infrastructure.	1.111	1.147	1.147
(U) Total Cost	26.287	24.491	17.966

(U) <u>C. Other Program Funding Summary (\$ in Millions)</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Complete</u>							
(U) Other APPN										
(U) Related RDT&E PE 0604759F, Major T&E Investment; PE 0604940D, Central T&E Investment Program; PE 0603941D, Test and Evaluation Science and Technology; PE 0605807F, T&E Support; PE 0605978F, Facilities Sustainment - T&E Support; PE 0605976F, Facility Restoration and Modernization; PE 0605814OTE, Operational Test Activities and Analysis.										

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Development

PROJECT NUMBER AND TITLE

3321 Electronic Warfare Ground Test
Resources

(U) D. Acquisition Strategy

This program element uses several different contracting strategies to provide the most cost effective T&E investment solutions. The main acquisition strategy is to use full and open competition wherever possible to improve and modernize existing test capabilities.

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Cost (\$ in Millions)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost to Complete	Total
7500 Foreign Materiel Acquisition/Analysis	6.971	7.791	7.617	0.000	0.000	0.000	0.000	0.000	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0		

(U) 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 for all threat aircraft, air-to-air missiles, air-to-ground bomb/missiles, satellites, early warning radars, Intercontinental Ballistic Missiles, and provide data to all DoD components.

Budget Activity Justification: This Program Element is in Budget Activity 6, Management Support, because it is a Research and Development (R&D) effort for Improvement and Modernization of T&E capabilities at Air Force Test Centers.

(U) B. Accomplishments/Planned Program (\$ in Millions)

	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>
(U) Accomplishments/Planned Program:			
(U) Funds the acquisition of Foreign Materiel IAW the prioritized Air Force Foreign Materiel Acquisition list; subject to assets availability.	3.228	3.655	3.573
(U) Funds the analysis of acquired Foreign Materiel IAW prioritized lists and specific analysis plans.	2.908	3.292	3.221
(U) Funds the operations and maintenance of the specialized Foreign Materiel assets.	0.835	0.844	0.823
(U) Total Cost	6.971	7.791	7.617

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

	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Complete</u>							
(U) Other APPN None.										

(U) D. Acquisition Strategy

Not applicable.