

## UNCLASSIFIED

PE NUMBER: 0604256F

PE TITLE: Threat Simulator Development

## Exhibit R-2, RDT&amp;E Budget Item Justification

DATE

February 2006

## BUDGET ACTIVITY

06 RDT&amp;E Management Support

## PE NUMBER AND TITLE

0604256F Threat Simulator Development

Cost (\$ in Millions)	FY 2005 Actual	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total
Total Program Element (PE) Cost	32.975	32.083	38.131	37.915	37.998	38.561	38.921	Continuing	TBD
2907 Electronic Combat Intel Support	1.847	1.810	2.112	2.154	2.186	2.231	2.267	Continuing	TBD
3321 Electronic Warfare Ground Test Resources	23.985	23.002	28.522	28.023	28.040	28.625	28.889	Continuing	TBD
7500 Foreign Materiel Acquisition/Exploitation	7.143	7.271	7.497	7.738	7.772	7.705	7.765	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. 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 so as 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 military action involving the use of electromagnetic and directed energy 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 operation and improvements, hardware in the loop test facilities operation and improvements, installed system test facility improvements, and development and improvement of open air threat simulators for flight testing. 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 test and evaluation (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. This PE provides funding to support the acquisition and exploitation efforts of the Foreign Materiel Program as well as to support 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.

## Exhibit R-2, RDT&amp;E Budget Item Justification

DATE

February 2006

BUDGET ACTIVITY

06 RDT&amp;E Management Support

PE NUMBER AND TITLE

0604256F Threat Simulator Development

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

	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
(U) Previous President's Budget	34.517	32.546	37.551
(U) Current PBR/President's Budget	32.975	32.083	38.131
(U) Total Adjustments	-1.542	-0.463	
(U) Congressional Program Reductions			
Congressional Rescissions	-0.331	-0.463	
Congressional Increases			
Reprogrammings	-0.471		
SBIR/STTR Transfer	-0.740		
(U) <u>Significant Program Changes:</u>			

## UNCLASSIFIED

Exhibit R-2a, RDT&E Project Justification								DATE <b>February 2006</b>	
BUDGET ACTIVITY <b>06 RDT&amp;E Management Support</b>				PE NUMBER AND TITLE <b>0604256F Threat Simulator Development</b>			PROJECT NUMBER AND TITLE <b>2907 Electronic Combat Intel Support</b>		
Cost (\$ in Millions)	FY 2005 Actual	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total
2907 Electronic Combat Intel Support	1.847	1.810	2.112	2.154	2.186	2.231	2.267	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0		
<p>(U) <b><u>A. Mission Description and Budget Item Justification</u></b></p> <p>This project provides funding to support Foreign Materiel Operational Test and Evaluation (FMOT&amp;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; 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).</p> <p>Budget Activity Justification: This Program Element is in Budget Activity 6, Management Support, because it is a Research and Development (R&amp;D) effort for Improvement and Modernization of T&amp;E capabilities at Air Force Test Centers.</p>									
(U) <b><u>B. Accomplishments/Planned Program (\$ in Millions)</u></b>						<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	
(U) Accomplishments/Planned Program:									
(U) Funds fighter and bomber testing for foreign materiel operational exploitation. Extensive evaluations and reporting of blue system effectiveness to be accomplished.						1.099	1.084	1.343	
(U) Funds mobility/special operations transport/helicopter testing for foreign materiel operational exploitation. Extensive evaluations and reporting of blue system effectiveness to be accomplished.						0.723	0.708	0.689	
(U) Funds classified operational assessments for foreign materiel operational exploitation. Extensive evaluations and reporting to be accomplished.						0.025	0.018	0.080	
(U) Total Cost						1.847	1.810	2.112	
(U) <b><u>C. Other Program Funding Summary (\$ in Millions)</u></b>									
	<u>FY 2005</u> <u>Actual</u>	<u>FY 2006</u> <u>Estimate</u>	<u>FY 2007</u> <u>Estimate</u>	<u>FY 2008</u> <u>Estimate</u>	<u>FY 2009</u> <u>Estimate</u>	<u>FY 2010</u> <u>Estimate</u>	<u>FY 2011</u> <u>Estimate</u>	<u>Cost to</u> <u>Complete</u>	<u>Total Cost</u>
(U) Other APPN									
None									
(U) <b><u>D. Acquisition Strategy</u></b>									
Not applicable.									

## Exhibit R-2a, RDT&amp;E Project Justification

DATE

February 2006

BUDGET ACTIVITY

06 RDT&amp;E Management Support

PE NUMBER AND TITLE

0604256F Threat Simulator  
Development

PROJECT NUMBER AND TITLE

3321 Electronic Warfare Ground Test  
Resources

Cost (\$ in Millions)	FY 2005 Actual	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total
3321 Electronic Warfare Ground Test Resources	23.985	23.002	28.522	28.023	28.040	28.625	28.889	Continuing	TBD
Quantity of RDT&E Articles	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. 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 (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 EW T&E M&S program leads correlation, verification and validation (V&V) activities of integrated simulations of validated models across the EW test facilities using the Silver Bullet measurement capability. The Electronic Warfare Test Analysis Tools & Methodologies (EWTATM) project will leverage advances made by EW T&E M&S to standardize test methodologies and provide common tools for data reduction and analysis. The National Radar Cross Section (RCS) Test Facility - NRTF (formerly Radar Target Scatter (RATSCAT)) upgrades provide improvements to the NRTF at Holloman AFB, NM, to support RCS measurement requirements of DoD and commercial customers, with either conventional or stealth systems. 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-automatic 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 DIADS Upgrades project will provide improvements to the existing DIADS system. The Installed Test Integration Program (ITIP) capitalizes on the capabilities developed by Electronic Combat Integrated Test (ECIT) and develops a multi-spectral synthetic battlespace with virtual and constructive modeling and simulation test and evaluation 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).

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)**FY 2005FY 2006FY 2007

(U) Accomplishments/Planned Program:

(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.

1.064

1.084

1.070

(U) EW T&E M&S. Develop and deploy the V&V process for scalable integration with simulations to support

2.496

## UNCLASSIFIED

Exhibit R-2a, RDT&E Project Justification			DATE February 2006		
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		
(U) <b>B. Accomplishments/Planned Program (\$ in Millions)</b>			<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
developmental and operational testing and training. Develop simulation based EW T&E tools and methodologies in support of EW test engineer's implementation of the EW Test Process. Integrate and correlate the process between EW T&E and training facilities supported by Silver Bullet.					
(U)	NRTF Upgrades. Enhance efficiency of operations and accuracy of low observable measurements. Assess and develop initial studies and concept design for advanced target suspension systems. Improve secure test program capability.		2.281	1.578	2.660
(U)	AFEWES. Operation in support of DoD and non-DoD test customers to include upgrades to the IR and RF test capability, development of an IR Missile Warning System Pointer-Tracker evaluation capability, and V&V effort on all threat simulators. Integration of RF SAM-E2, RF SAM-F, RF SAM-H, IR SAM-M and IR SAM-N. Continue development of integrated test capability with OAR(s). Transition of flyout models to most current DIA baseline. Integration of Joint Research and Assessment Center (JRAAC) semi-active radar simulation and other test facilities with AFEWES threat suite. Development of IR background scene environment.		4.672	6.242	8.157
(U)	DIADS. Providing mission level simulation for evaluating the survivability of aircraft penetrating an enemy air defense system by updating the Integrated Air Defense System scenario and C2 player library with current intelligence data. Continue integrating DIADS with other Avionics Test & Integration Complex (ATIC) components, including Joint Communication Simulator (JCS), Combat Electromagnetic Environment Simulator (CEESIM), Advanced Radar Environment Simulator (ARES), and AWMS. Perform parametric validation comparisons and OAR side-by-side correlation with DIADS C2 player library. Upgrade model to match new & improved air defense functions of potential threat systems and maintain model currency. Maintain external interfaces using high level architecture (HLA) and Distributed Interactive Simulation (DIS) capability to support exercises and current and future users: F-22A, F-35, Virtual Strike Warfare Environment, Simulation and Analysis Facility (SIMAF), F-117, UCAV/UCAS, and others. Complete initial development of interfaces to Blue C4ISR models such as Distributed Mission Operations Center (DMOC) Rivet Joint, AWACS, and Joint STARS simulations.		2.948		
(U)	ITIP. Integration of ATIC RF and IR stimulators to replicate an EW battlespace to support testing of advanced weapon systems such as the F-22A, F-35, JUCAS, and Compass Call. Includes upgrades of existing stimulators: Advanced Radar Environment Simulator (ARES), IR Sensor Stimulator (IRSS), RF Threat Simulators, and Communication, Navigation, Intelligence (CNI) simulator and integration of those upgrades into the electronic battlespace. Newly integrated capabilities are ARES free space and direct injection radar target generation, EW simulator direct injection, IR/UV missile warning stimulators, and improvements to test control, real-time data displays, scenario development, data reduction, and analysis functions. Integration with DIADS.		7.257	7.340	8.300
(U)	AWMS. Integrating EW capabilities into flight simulator modernization reconfigurable cockpits 1 and 2. Requirements study and site preparation of phase 2 of site preparation for high fidelity simulators 3 and 4.		3.267	1.437	2.045
Project 3321		R-1 Shopping List - Item No. 104-5 of 104-7	Exhibit R-2a (PE 0604256F)		

## UNCLASSIFIED

Exhibit R-2a, RDT&E Project Justification							DATE <b>February 2006</b>	
BUDGET ACTIVITY <b>06 RDT&amp;E Management Support</b>				PE NUMBER AND TITLE <b>0604256F Threat Simulator Development</b>		PROJECT NUMBER AND TITLE <b>3321 Electronic Warfare Ground Test Resources</b>		
(U)	<b><u>B. Accomplishments/Planned Program (\$ in Millions)</u></b>					<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
	Construction and integration of second helmet mounted display. Design aircraft specific cockpit console set.							
(U)	DIADS UPGRADES improve fidelity of the DIADS model by maintaining currency with the Threat Modeling and Analysis Program (TMAP) modeling architecture for threat models and upgrading individual integrated air defense system elements such as the radar model and surface to air missile model. DIADS will also be improved by incorporating changes in the threat as evidenced by updates to intelligence databases. Develop distributed interfaces between DIADS and Blue (e.g. friendly) C4ISR simulations to develop a coherent synthetic battlespace for the test and training of multi-platform sensor integration programs. An architecture update will be incorporated to move from large proprietary computers to a non-proprietary personal computer based system as well as other technical refresh updates to the system. Improve man-in-the-loop functionality by upgrading DIADS operator displays and adding new operator positions. Continue the parametric validation effort of various DIADS components.						3.855	4.750
(U)	EWTATM establishes methodologies and provides tools to standardize data reduction across the Test Facilities. These tools will be interfaced with the Measure of Performance Analysis Tool (MOPAT) developed under an earlier program. EWTATM will also expand the MOPAT with the addition of new MOPs. As these tools are developed, the results will be incorporated in the Test Methodology Reference.						1.466	1.540
(U)	Total Cost					23.985	23.002	28.522
(U)	<b><u>C. Other Program Funding Summary (\$ in Millions)</u></b>							
	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>Cost to</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</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 0605804D, Development Test and Evaluation.							
(U)	<b><u>D. Acquisition Strategy</u></b> Contracts funded from this program are predominately awarded on the basis of full and open competition.							

## UNCLASSIFIED

## Exhibit R-2a, RDT&amp;E Project Justification

DATE

February 2006

BUDGET ACTIVITY

06 RDT&amp;E Management Support

PE NUMBER AND TITLE

0604256F Threat Simulator  
Development

PROJECT NUMBER AND TITLE

7500 Foreign Materiel  
Acquisition/Exploitation

Cost (\$ in Millions)	FY 2005 Actual	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total
7500 Foreign Materiel Acquisition/Exploitation	7.143	7.271	7.497	7.738	7.772	7.705	7.765	Continuing	TBD
Quantity of RDT&E Articles	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 exploitation of foreign materiel. Items considered for these Foreign Materiel Acquisition and Exploitation (FMA&E) funds are included in the prioritized Air Force FMA list established each year. Each MAJCOM prepares and approves a Foreign Materiel - Mission Need Statement for each requirement. Annually, the MAJCOM commanders establish a list of their top 20 requirements. The MAJCOM's requirements lists are then integrated into an Air Force requirement list. Each MAJCOM then approves the AF list and requirements, and final validation comes from the Air Force Vice Chief of Staff. Exploitations are based on and driven by acquisitions. The list is classified secret. The USAF is tasked by OSD to be the DoD Executive Agent for all threat aircraft, air-to-air missiles, air-to-ground bomb/missiles, satellites, early warning radars, and Intercontinental Ballistic Missiles. As the Executive Agent, the AF is tasked to acquire, exploit 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)**FY 2005FY 2006FY 2007

(U) Accomplishments/Planned Program:

(U) Funds the acquisition of Foreign Materiel IAW the prioritized Air Force Foreign Materiel Acquisition list; subject to assets availability.

4.226

3.318

3.519

(U) Funds the exploitation of acquired Foreign Materiel IAW prioritized lists and specific exploitation plans.

1.827

3.047

3.169

(U) Funds the operations and maintenance of the specialized Foreign Materiel assets.

1.090

0.906

0.809

(U) Total Cost

7.143

7.271

7.497

(U) **C. Other Program Funding Summary (\$ in Millions)**FY 2005FY 2006FY 2007FY 2008FY 2009FY 2010FY 2011Cost toTotal CostActualEstimateEstimateEstimateEstimateEstimateEstimateComplete

(U) Other APPN

None.

(U) **D. Acquisition Strategy**

Not applicable.