

UNCLASSIFIED

PE NUMBER: 0604256F
 PE TITLE: Threat Simulator Development

Exhibit R-2, RDT&E Budget Item Justification	DATE February 2008
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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 2007 Actual	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	Cost to Complete	Total
Total Program Element (PE) Cost	37.411	39.639	34.568	38.791	40.839	42.359	42.642	Continuing	TBD
2907 Electronic Combat Intel Support	2.072	2.163	2.198	2.244	2.276	2.321	2.368	Continuing	TBD
3321 Electronic Warfare Ground Test Resources	27.983	29.704	24.558	28.799	30.767	32.091	32.164	Continuing	TBD
7500 Foreign Materiel Acquisition/Exploitation	7.356	7.772	7.812	7.748	7.796	7.947	8.110	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 improvements, hardware-in-the-loop test facilities improvements, and installed system test facility improvements. Test investment activities will also be funded through the Technology Insertion & Risk Reduction (TIRR) program. The TIRR program will provide funds to initiate studies of 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 the cost and risk associated with new technologies and methodologies using short-term (1-3 years) limited-funding projects 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 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&E Budget Item Justification

DATE

February 2008

BUDGET ACTIVITY

06 RDT&E Management Support

PE NUMBER AND TITLE

0604256F Threat Simulator Development

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

	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
(U) Previous President's Budget	37.987	39.892	39.856
(U) Current PBR/President's Budget	37.411	39.639	34.568
(U) Total Adjustments	-0.576	-0.253	
(U) Congressional Program Reductions			
Congressional Rescissions	-0.576	-0.253	
Congressional Increases			
Reprogrammings			
SBIR/STTR Transfer			
(U) <u>Significant Program Changes:</u>			

Exhibit R-2a, RDT&E Project Justification

DATE
February 2008

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 2007 Actual	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	Cost to Complete	Total
2907 Electronic Combat Intel Support	2.072	2.163	2.198	2.244	2.276	2.321	2.368	Continuing	TBD
Quantity of RDT&E Articles	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; 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 2007</u>	<u>FY 2008</u>	<u>FY 2009</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.	1.319	1.330	1.350
(U) Funds mobility/special operations transport/helicopter testing for foreign materiel operational exploitation. Extensive evaluations and reporting of blue system effectiveness to be accomplished.	0.673	0.770	0.765
(U) Funds classified operational assessments for foreign materiel operational exploitation. Extensive evaluations and reporting to be accomplished.	0.080	0.063	0.083
(U) Total Cost	2.072	2.163	2.198

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

	<u>FY 2007</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>Cost to Complete</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>		
(U) Other APPN None.									

(U) D. Acquisition Strategy

Not applicable.

Exhibit R-2a, RDT&E Project Justification

DATE

February 2008

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 2007 Actual	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	Cost to Complete	Total
3321 Electronic Warfare Ground Test Resources	27.983	29.704	24.558	28.799	30.767	32.091	32.164	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 Electronic Warfare Test Analysis Tools & Methodologies (EWTATM) project standardizes test methodologies and provides common tools for data reduction and analysis. The National Radar Cross Section 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 DIADS Upgrades project will provide improvements to the existing DIADS system. The Installed Test Integration Program (ITIP) 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). Test investment activities will also be funded through the Technology Insertion & Risk Reduction (TIRR) program. The TIRR program will provide funds to initiate studies of 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 the cost and risk associated with new technologies and methodologies using short-term (1-3 years) limited-funding projects prior to investing in larger programs.

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.

UNCLASSIFIED

Exhibit R-2a, RDT&E Project Justification

DATE

February 2008

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		
		FY 2007	FY 2008	FY 2009
(U) <u>B. Accomplishments/Planned Program (\$ in Millions)</u>				
(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.		0.844	1.126	1.147
(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.		2.660	2.790	2.538
(U) AFEWES. Includes upgrades to the IR and RF test capability, development of an IR Missile Warning System Pointer-Tracker evaluation capability, and development of improved IR foreground scene environment. Includes development of RF SAM-E2, RF SAM-F, RF SAM-H, IR SAM-K, IR SAM-M, and IR SAM-N simulators. Includes development of integrated test capability with OAR(s), as well as integrating the AFEWES threat suite with other test capabilities. Includes transition of flyout models to most current DIA or NASIC baseline and Verification and Validation efforts on all threat simulators.		5.843	3.325	3.353
(U) ITIP. Integration of ATIC (Avionics Test and Integration Complex) RF simulators/stimulators to replicate an EW battlespace to support testing of advanced weapons systems such as the F-22A, F-35, UAS, and Compass Call; includes upgrades of RF environment monitoring capabilities, as well as existing simulators/stimulators: Advanced Radar Environment Simulator (ARES), IR Sensor Stimulator (IRSS), RF threat simulators and Communications, Navigation and Identification (CNI) simulator and the integration of those upgrades into the electronic battlespace. Newly integrated capabilities include DIADS, ARES free-space radar target generation, JCS (Joint Communications Simulator), EW RF signal free-space generation; improvements to test control, real-time data displays, scenario development, data reduction and analysis functions.		10.301	8.751	7.323
(U) AWMS. Builds 2 TS/SAR modeling & simulation facilities and 2 reconfigurable/reusable high fidelity manned flight simulators with 360 degree field-of-view visual systems. It adds integrated avionics and EW capability to 4 simulators. Develops full mission level simulation capabilities, internal & external linking, and interoperable tools to run distributed simulations in multi-ship formations for Test & Evaluation of modern aircraft such as the F-35 and F-16. AWMS provides man-in-the-loop capability to other T&E assets.		2.045	1.629	3.755
(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		4.750	4.713	4.162

R-1 Line Item No. 94

Page-5 of 7

Project 3321

Exhibit R-2a (PE 0604256F)

1087

UNCLASSIFIED

Exhibit R-2a, RDT&E Project Justification

DATE

February 2008

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 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
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.			
(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 Measures Of Performance (MOPs). As these tools are developed, the results will be incorporated in the Test Methodology Reference.	1.540	1.989	2.062
(U) Technology Insertion & Risk Reduction (TIRR): will provide funds to initiate studies of new technologies and test methodologies to determine their feasibility for future T&E investment within the scope of this program element. Will reduce the cost and risk associated with new technologies and methodologies using short-term (1-3 years) limited-funding projects prior to investing in larger programs.		5.381	0.218
(U) Total Cost	27.983	29.704	24.558

(U) <u>C. Other Program Funding Summary (\$ in Millions)</u>	<u>FY 2007</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>Cost to Complete</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</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; PE 0605814D, Operational Test Activities and Analysis.									
(U) <u>D. Acquisition Strategy</u>									
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.									

Exhibit R-2a, RDT&E Project Justification

DATE
February 2008

BUDGET ACTIVITY 06 RDT&E Management Support				PE NUMBER AND TITLE 0604256F Threat Simulator Development			PROJECT NUMBER AND TITLE 7500 Foreign Materiel Acquisition/Exploitation		
Cost (\$ in Millions)	FY 2007 Actual	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	Cost to Complete	Total
7500 Foreign Materiel Acquisition/Exploitation	7.356	7.772	7.812	7.748	7.796	7.947	8.110	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 a classified 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 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) <u>B. Accomplishments/Planned Program (\$ in Millions)</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</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.	3.450	3.649	3.666
(U) Funds the exploitation of acquired Foreign Materiel IAW prioritized lists and specific exploitation plans.	3.097	3.288	3.302
(U) Funds the operations and maintenance of the specialized Foreign Materiel assets.	0.809	0.835	0.844
(U) Total Cost	7.356	7.772	7.812

(U) <u>C. Other Program Funding Summary (\$ in Millions)</u>	<u>FY 2007</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>Cost to</u>	<u>Total Cost</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
None.

(U) **D. Acquisition Strategy**
Not applicable.