

UNCLASSIFIED

PE NUMBER: 0605024F

PE TITLE: Anti-Tamper Technology Executive Agent

Exhibit R-2, RDT&E Budget Item Justification								DATE February 2006	
BUDGET ACTIVITY 07 Operational System Development				PE NUMBER AND TITLE 0605024F Anti-Tamper Technology Executive Agent					
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	7.345	7.715	8.014	8.013	8.014	8.199	8.339	Continuing	TBD
5066 Anti-Tamper Technology Executive Agent	7.345	7.715	8.014	8.013	8.014	8.199	8.339	Continuing	TBD
<p>(U) <u>A. Mission Description and Budget Item Justification</u></p> <p>The Air Force is the DoD Executive Agent for implementing Anti-Tamper (AT) policy, developing AT technology, establishing and maintaining a data bank/library, providing proper security mechanisms, and conducting effective validation . The purpose of developing AT measures is to protect critical technologies in U.S. weapon systems that may be sold to foreign governments or that could possibly fall into enemy hands. AT technology will permit the U.S. to preserve its critical weapons systems lead while also satisfying customer needs. Furthermore, AT will add longevity to critical technologies by deterring efforts to reverse engineer, or develop weapon countermeasures against a system or system component.</p> <p>As Executive Agent, the Air Force will coordinate the technology development among the Services, DoD Agencies and laboratories, and with industry. The Anti-Tamper technology development will occur in the following areas: advanced sensor hardware, generic electronic hardware, signature control, access detection & denial, software, and effectiveness. In the advanced sensor hardware area, antenna arrays, focal plane arrays, & T/R modules are areas of importance for AT technology development. AT technology for other advanced sensor hardware will also be developed as required. In the general electronic hardware area, AT technology development will be evaluated first for memory circuits and processors, followed by other electronic hardware. In the signature control area, AT technology development will be evaluated for radar absorbing materials and other low observable techniques. AT technology development for other signature control areas will be evaluated on a case-by-case basis. Measures of Effectiveness (MOEs) and the verification and validation of Anti-Tamper are also areas required further development. The program management activities will coordinate the technology development and establish the Anti-Tamper data bank/library.</p> <p>Anti-Tamper validation is a significant responsibility assigned to the Air Force from OSD. All DoD acquisition programs, Foreign Military Sales, and Direct Commercial Sales with critical technology/critical information are required to have an Anti-Tamper plan with appropriate validation. The resources required to review Anti-Tamper plans and conduct Anti-Tamper validation began to ramp-up in late FY03. Currently, there are approximately eight recognized Anti-Tamper experts throughout DoD. Based on Anti-Tamper validation requirement projections, this number needs to expand to approximately 40 DoD experts by FY07.</p>									

R-1 Shopping List - Item No. 119-1 of 119-8

Exhibit R-2 (PE 0605024F)

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0605024F Anti-Tamper Technology Executive Agent(U) **B. Program Change Summary (\$ in Millions)**

	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
(U) Previous President's Budget	7.789	7.715	8.014
(U) Current PBR/President's Budget	7.345	7.715	8.014
(U) Total Adjustments	-0.444	0.000	
(U) Congressional Program Reductions			
Congressional Rescissions	-0.006		
Congressional Increases			
Reprogrammings	-0.344		
SBIR/STTR Transfer	-0.094		
(U) <u>Significant Program Changes:</u>			
None			

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Exhibit R-2a, RDT&E Project Justification

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PROJECT NUMBER AND TITLE

5066 Anti-Tamper Technology
Executive Agent

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
5066 Anti-Tamper Technology Executive Agent	7.345	7.715	8.014	8.013	8.014	8.199	8.339	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0		

(U) **A. Mission Description and Budget Item Justification**

The Air Force is the DoD Executive Agent for implementing Anti-Tamper (AT) policy, developing AT technology, establishing and maintaining a data bank/library, providing proper security mechanisms, and conducting effective validation. The purpose of developing AT measures is to protect critical technologies in U.S. weapon systems that may be sold to foreign governments or that could possibly fall into enemy hands. AT technology will permit the U.S. to preserve its critical weapons systems lead while also satisfying customer needs. Furthermore, AT will add longevity to critical technologies by deterring efforts to reverse engineer, or develop weapon countermeasures against a system or system component.

As Executive Agent, the Air Force will coordinate the technology development among the Services, DoD Agencies and laboratories, and with industry. The Anti-Tamper technology development will occur in the following areas: advanced sensor hardware, generic electronic hardware, signature control, access detection & denial, software, and effectiveness. In the advanced sensor hardware area, antenna arrays, focal plane arrays, & T/R modules are areas of importance for AT technology development. AT technology for other advanced sensor hardware will also be developed as required. In the general electronic hardware area, AT technology development will be evaluated first for memory circuits and processors, followed by other electronic hardware. In the signature control area, AT technology development will be evaluated for radar absorbing materials and other low observable techniques. AT technology development for other signature control areas will be evaluated on a case-by-case basis. Measures of Effectiveness (MOEs) and the verification and validation of Anti-Tamper are also areas required further development. The program management activities will coordinate the technology development and establish the Anti-Tamper data bank/library.

Anti-Tamper validation is a significant responsibility assigned to the Air Force from OSD. All DoD acquisition programs, Foreign Military Sales, and Direct Commercial Sales with critical technology/critical information are required to have an Anti-Tamper plan with appropriate validation. The resources required to review Anti-Tamper plans and conduct Anti-Tamper validation began to ramp-up in late FY03. Currently, there are approximately eight recognized Anti-Tamper experts throughout DoD. Based on Anti-Tamper validation requirement projections, this number needs to expand to approximately 40 DoD experts by FY07.

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

	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
(U) Accomplishments/Planned Program	0.000	0.000	0.000
(U) Anti-Tamper Technology Development	2.668	2.878	2.745
(U) Anti-Tamper Verification & Validation	2.955	3.150	3.295
(U) Database & Website	0.409	0.311	0.528
(U) Program Management Activity	1.313	1.376	1.446
(U) Total Cost	7.345	7.715	8.014

Project 5066

R-1 Shopping List - Item No. 119-3 of 119-8

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

<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>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) N/A

(U) D. Acquisition Strategy

Program Research and Development Announcements (PRDAs) will be used for the Anti-Tamper technology development. A sole source contract will be used for some of the technical support.

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Exhibit R-3, RDT&E Project Cost Analysis

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(U) <u>Cost Categories</u> (Tailor to WBS, or System/Item Requirements) (\$ in Millions)	<u>Contract</u> <u>Method &</u> <u>Type</u>	<u>Performing</u> <u>Activity &</u> <u>Location</u>	<u>Total</u> <u>Prior to FY</u> <u>2005</u> <u>Cost</u>	<u>FY 2005</u> <u>Cost</u>	<u>FY 2005</u> <u>Award</u> <u>Date</u>	<u>FY 2006</u> <u>Cost</u>	<u>FY 2006</u> <u>Award</u> <u>Date</u>	<u>FY 2007</u> <u>Cost</u>	<u>FY 2007</u> <u>Award</u> <u>Date</u>	<u>Cost to</u> <u>Complete</u>	<u>Total Cost</u>	<u>Target Value</u> <u>of Contract</u>
(U) <u>Anti-Tamper Technology Development</u>												
AFRL/AT-SPI	PRDA			1.113		0.714		0.714		Continuing	TBD	TBD
Sandia National Lab	MIPR			0.320		0.350		1.350		Continuing	TBD	TBD
Technology Contract Activities				2.699		2.027		1.100		Continuing	TBD	TBD
Subtotal Anti-Tamper Technology Development			0.000	4.132		3.091		3.164		Continuing	TBD	TBD
Remarks:												
(U) <u>Anti-Tamper Verification & Validation</u>												
Air Force AT Field Agent (412 TW/EWF)	MIPR			0.400		0.450		0.550		Continuing	TBD	TBD
Navy AT Field Agent (PMR-51)	MIPR			0.550		0.600		0.700		Continuing	TBD	TBD
Army AT Field Agent (Aviation & Missile Cmd/Redstone)	MIPR			0.500		1.000		1.100		Continuing	TBD	TBD
DoD Executive Agent Field Agent (AFRL/AT-SPI)	Allot			0.850		1.400		0.553		Continuing	TBD	TBD
Sandia National Lab	MIPR			0.300		0.350		0.450		Continuing	TBD	TBD
Contingency Planning				0.218		0.400		0.400		Continuing	TBD	TBD
Subtotal Anti-Tamper Verification & Validation			0.000	2.818		4.200		3.753		Continuing	TBD	TBD
Remarks:												
(U) <u>Education, Out-Reach, and other support</u>												
AFMC/A9S						0.010		0.025		Continuing	TBD	TBD
AFRL/AT-SPI	Allot			0.105		0.348		0.383		Continuing	TBD	TBD
AT Course						0.016		0.016		Continuing	TBD	TBD
DAU Course						0.050		0.050		Continuing	TBD	TBD
AT PSO				0.290							0.290	
Subtotal Education, Out-Reach, and other support			0.000	0.395		0.424		0.474		Continuing	TBD	TBD
Remarks:												
(U) <u>Management</u>												
AFRL/AT-SPI	Allot			0.000		0.000		0.623		Continuing	TBD	TBD
Subtotal Management			0.000	0.000		0.000		0.623		Continuing	TBD	TBD
Remarks:												
(U) Total Cost			0.000	7.345		7.715		8.014		Continuing	TBD	TBD

Exhibit R-4, RDT&E Schedule Profile

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5066 Anti-Tamper Technology
Executive Agent***PE 060524F - Anti-Tamper***

KEY EVENTS	FY04				FY05				FY06				FY07				FY08				FY09				FY10			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
•Tech. Development •PRDA Contracts •PRDA Reviews	◆						▲				▲				▲				▲				▲				▲	◆
•Anti-Tamper V&V •Program V&V Evaluations	◆																											◆
•Database and Webpage •Webpage	◆																											◆
•Database Stand-up •Database population+maintain				▲	◆																							◆

Exhibit R-4, RDT&E Schedule Profile

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5066 Anti-Tamper Technology
Executive Agent***PE 060524F - Anti-Tamper***

KEY EVENTS	FY04				FY05				FY06				FY07				FY08				FY09				FY10			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
•Tech. Development																												
•PRDA Contracts																												
•PRDA Reviews																												
•Anti-Tamper V&V																												
•Program V&V Evaluations																												
•Database and Webpage																												
•Webpage																												
•Database Stand-up																												
•Database population+maintain																												

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Exhibit R-4a, RDT&E Schedule Detail

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(U) Anti-Tamper Technology Development

1-4Q

1-4Q

1-4Q

(U) -- PRDA Reviews

1-3Q

1-3Q

1-3Q

(U) -- PRDA Deliverables

4Q

4Q

4Q

(U) Anti-Tamper Verification & Validation

1-4Q

1-4Q

1-4Q

(U) Database and Website

1-4Q

1-4Q

1-4Q