

**UNCLASSIFIED**

PE NUMBER: 0603742F  
 PE TITLE: Combat Identification Technology

<b>Exhibit R-2, RDT&amp;E Budget Item Justification</b>	<b>DATE</b> <b>February 2004</b>
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<b>BUDGET ACTIVITY</b> <b>04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>PE NUMBER AND TITLE</b> <b>0603742F Combat Identification Technology</b>
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Cost (\$ in Millions)	FY 2003 Actual	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	Cost to Complete	Total
Total Program Element (PE) Cost	11.580	16.434	19.582	19.785	20.160	20.483	20.799	Continuing	TBD
2597 Noncooperative Identification Subsystems	11.580	16.434	19.582	19.785	20.160	20.483	20.799	Continuing	TBD

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

U.S. Combat Air Forces have a critical requirement to positively identify (enemy, friendly, neutral) aircraft, battlefield equipment and personnel/combatants. Multiple other Joint needs statements, operational documents, lessons learned, and NATO requirements documents also state Combat Identification (CID) operational needs. High confidence & high probability of ID, all weather & day/night operational needs as well as timely and reliable CID will improve combat effectiveness, reduce fratricide and enable battlespace commanders to effectively manage and control their forces.

The Combat Identification Technology program analyzes, develops, demonstrates, and transitions to SDD programs promising target identification technologies. These technologies include both cooperative and non-cooperative techniques that improve US ability to positively identify ground and air targets in Air-to-Surface and Air-to-Air CID engagements.

Air-to-Surface technologies funded by this program include Laser Vision, an electro-optical (EO) system that significantly increases ID ranges; Radar Vision which uses air-to-ground radar imaging to identify tactical ground targets by their radar signatures; Vibration Vision, which exploits vibration signatures to increase probability and confidence of ground target ID; and the maturation of algorithms for these efforts to support Automatic Target Cueing (ATC) and Automatic Target Recognition (ATR).

Air-to-Air technologies funded by this program include High Range Resolution (HRR) radar techniques to increase ID ranges as well as confidence, and developing the Mark XIIIA system to implement Mode V, which will enable robust, secure Identification Friend or Foe (IFF), a significant deficiency in Operation Iraqi Freedom.

Current and future space-based systems can facilitate these processes leading ultimately to Automatic Target Recognition (ATR) fusion and net-centric warfare. ATR shall focus on development, demonstration and integration of technologies drawing all available information data elements or platforms (national, tactical, fighter, bomber, ISR). The desired outcome would provide the operational-level decision maker a single, fused display of all threats or assets. These technologies must provide near-real time information, to include SCI and classified data information, to the operational and tactical level decision authorities for both ground and airborne systems. Efforts should also focus on development and approval of new technologies to all for this information to be shared across security levels, services and with foreign participants.

This program is in Budget Activity 4 - Advanced Component Development and Prototypes (ACD&P). The PE includes advanced technology demonstrations that help transition technologies from laboratory to operational use.

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

DATE

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BUDGET ACTIVITY

04 Advanced Component Development and Prototypes (ACD&amp;P)

PE NUMBER AND TITLE

0603742F Combat Identification Technology

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

	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
(U) Previous President's Budget	12.135	16.575	16.633
(U) Current PBR/President's Budget	11.580	16.434	19.582
(U) Total Adjustments	-0.555	-0.141	
(U) Congressional Program Reductions			
Congressional Rescissions	-0.123	-0.141	
Congressional Increases			
Reprogrammings	0.014		
SBIR/STTR Transfer	-0.446		
(U) <u>Significant Program Changes:</u>			

<b>Exhibit R-2a, RDT&amp;E Project Justification</b>	DATE <b>February 2004</b>
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<b>BUDGET ACTIVITY</b> <b>04 Advanced Component Development and Prototypes (ACD&amp;P)</b>				<b>PE NUMBER AND TITLE</b> <b>0603742F Combat Identification Technology</b>			<b>PROJECT NUMBER AND TITLE</b> <b>2597 Noncooperative Identification Subsystems</b>		
Cost (\$ in Millions)	FY 2003 Actual	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	Cost to Complete	Total
2597 Noncooperative Identification Subsystems	11.580	16.434	19.582	19.785	20.160	20.483	20.799	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0		

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

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Air-to-Air technologies funded by this program include High Range Resolution (HRR) radar techniques to increase ID ranges as well as confidence, and developing the Mark XIIA system to implement Mode V, which will enable robust, secure Identification Friend or Foe (IFF), a significant deficiency in Operation Iraqi Freedom.

Current and future space-based systems can facilitate these processes leading ultimately to Automatic Target Recognition (ATR) fusion and net-centric warfare. ATR shall focus on development, demonstration and integration of technologies drawing all available information data elements or platforms (national, tactical, fighter, bomber, ISR). The desired outcome would provide the operational-level decision maker a single, fused display of all threats or assets. These technologies must provide near-real time information, to include SCI and classified data information, to the operational and tactical level decision authorities for both ground and airborne systems. Efforts should also focus on development and approval of new technologies to all for this information to be shared across security levels, services and with foreign participants.

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

(U) Continue the HRR synthetic target database development in conjunction with NAIC. Implement risk reduction to	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
	2.950	6.888	7.329

Exhibit R-2a, RDT&E Project Justification							DATE <b>February 2004</b>		
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<b>04 Advanced Component Development and Prototypes (ACD&amp;P)</b>			<b>0603742F Combat Identification Technology</b>			<b>2597 Noncooperative Identification Subsystems</b>			
<p>increase the fidelity of the HRR database and prepare for the transition of database management/maintenance from the lab environment to a SPO.</p>									
(U)	Continue development and demonstration of promising air-to-ground and air-to-air identification techniques for reduce battlefield fratricide and enhanced mission performance. Transition program candidates include continuing development and integration of ERASER/Laser Vision, baselining associated EO/ATC/ATR capability, continuing las vibrometry investigation portion of defunct multi-Vision program , and continuing to mature/harden camera technolog for flight environments. Other potential candidates could include AGRI (Air-to-Ground Radar Imaging), of which Rac Vision is the transition program, and vibration exploitation technologies.					6.743	6.377	8.733	
(U)	Fund AIMS Program Office support of Mark XII systems to include current and next generation IFF equipment integration, including Mode V documentation and individual IFF system/box certification.					0.713	0.773	0.851	
(U)	Continue funding the CID Integrated Management Team and other engineering support necessary for management of CID efforts. Includes support for Mode V IFF flight demonstration.					0.678	0.820	0.904	
(U)	Conduct CID-related studies/demos and conferences. Execute Mode V IFF flight test preparations and demonstration assess system operational capacity, interoperability, and equipment integration.Studies/demos will include those direct by the Joint Staff and OSD to research implementation and evaluation of a family of CID systems, linkage between airborne and ground-based non-cooperative CID technologies/systems, and to attempt to quantify the relationship between CID and improved combat effectiveness.					0.496	1.576	1.765	
(U)	Total Cost					11.580	16.434	19.582	
(U)	<b><u>C. Other Program Funding Summary (\$ in Millions)</u></b>								
		<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</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)	Not Applicable	0.000	0.000	0.000					0.000
(U)	<b><u>D. Acquisition Strategy</u></b>								
	The High Range Resolution (HRR) database development program was awarded under a competitive bid process. Other combat identification efforts in project 2597 focus on developing and demonstrating the most promising Air-to-Ground Combat ID techniques and were contracted for under a competitive Request For Proposal (RFP) process. Laser Vision was awarded utilizing Other Transaction Agreement (OTA)s, which utilize the same competitive process of Request for Proposal (RFP), proposal submittal and negotiation of costs prior to award.								

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Exhibit R-3, RDT&E Project Cost Analysis										DATE <b>February 2004</b>			
BUDGET ACTIVITY <b>04 Advanced Component Development and Prototypes (ACD&amp;P)</b>					PE NUMBER AND TITLE <b>0603742F Combat Identification Technology</b>					PROJECT NUMBER AND TITLE <b>2597 Noncooperative Identification Subsystems</b>			
<u>(U) Cost Categories</u>	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total</u>	<u>FY</u>	<u>FY</u>	<u>FY</u>	<u>FY</u>	<u>FY</u>	<u>FY</u>	<u>Cost to</u>	<u>Total</u>	<u>Target</u>	
(Tailor to WBS, or System/Item Requirements) (\$ in Millions)			<u>Prior to FY</u>	<u>2003</u>	<u>2003</u>	<u>2004</u>	<u>2004</u>	<u>2005</u>	<u>2005</u>	<u>Complete</u>	<u>Cost</u>	<u>Value of</u>	
			<u>Cost</u>	<u>Cost</u>	<u>Award</u>	<u>Cost</u>	<u>Award</u>	<u>Cost</u>	<u>Award</u>			<u>Contract</u>	
					<u>Date</u>		<u>Date</u>		<u>Date</u>				
<u>(U) Product Development</u>													
Raytheon Co	C/CPFF	El Segundo CA	2.115	1.988	Jun-03	3.400	Jun-04	2.900	Jun-05	Continuing	TBD		
General Dynamics	C/CPFF	Dayton OH	0.800			0.100	Oct-03	0.400	Oct-04	Continuing	TBD		
Simulation Support, Inc.	C/CP	Arlington VA	0.330							0.330	0.660		
National Air Intel Center	MIPR	Dayton OH	3.329			1.000	Feb-04	1.000	Feb-05	0.000	5.329		
Northrop Grumman Corp	C/CPFF	Baltimore MD	1.856							Continuing	TBD		
ERASER-Raytheon	C/CPFF	Plano TX	0.462							Continuing	TBD		
Raytheon Co	C/TBD	El Segundo CA	0.150	3.430	May-03	2.090	May-04	3.400	May-05	Continuing	TBD		
Lockheed Martin	TBD	Orlando FL	0.150							Continuing	TBD		
Northrup Grumman	TBD	Rolling Meadows IL	0.150							Continuing	TBD		
Demaco	C/CPFF	Dayton OH	6.604	1.180	Oct-02	0.409	Oct-03			0.000	8.193		
SAIC (Demaco, Inc)	SS/CPFF	Dayton OH	2.078	0.800	Oct-02	1.750	Oct-03	3.000	Oct-04	Continuing	TBD		
Cyberdynamics	SS/CPFF	Dayton OH	0.010							Continuing	TBD		
AIMS Program Office	MIPR	Warner Robins GA	0.954	0.713	Oct-02	0.719	Oct-03	0.726	Oct-04	Continuing	TBD		
Air Force Research Laboratory (Camera & ATR development)	MIPR	Dayton OH	2.000							Continuing	TBD		
Air Force Research Laboratory (LV)	MIPR	Dayton OH	1.353	1.053						Continuing	TBD		
Telephonics	TBD	Long Island NY	0.000	0.586	Nov-02	0.305	Nov-03			Continuing	TBD		
Subtotal Product Development			22.341	9.750		9.773		11.426		Continuing	TBD	0.000	
Remarks:													
<u>(U) Support</u>													
USAF Combat ID IMT and Engineering Support	Various	Hanscom AFB MA	4.584	1.374	Oct-02	1.500	Oct-03	1.721	Oct-04	Continuing	TBD		
Air Force Research Laboratory (HRR)	MIPR	Dayton OH	2.392	0.456	Feb-03	3.124	Feb-04	3.200	Feb-05	Continuing	TBD		
Air Force Research Laboratory (ERASER)	MIPR	Dayton OH	0.000					1.315	Feb-05	0.000	1.315		
Subtotal Support			6.976	1.830		4.624		6.236		Continuing	TBD	0.000	
Remarks:													
<u>(U) Test &amp; Evaluation</u>													
3246th Test Wing, Eglin AFB, FL 544th	MIPR	Eglin AFB FL / Nellis	4.089			0.670				Continuing	TBD		

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Range Group		AFB NV								
412 Test Wing	MIPR	Edwards AFB CA	0.239					Continuing	TBD	
552nd Air Control Wing	MIPR	Tinker AFB OK	0.000			0.530 Aug-04		Continuing	TBD	
Subtotal Test & Evaluation			4.328	0.000		1.200	0.000	Continuing	TBD	0.000
Remarks:										
(U) <u>Management</u>										
						0.837	1.920		2.757	
Subtotal Management			0.000	0.000		0.837	1.920	0.000	2.757	0.000
Remarks:										
(U) Total Cost			33.645	11.580		16.434	19.582	Continuing	TBD	0.000

Exhibit R-4, RDT&E Schedule Profile

DATE

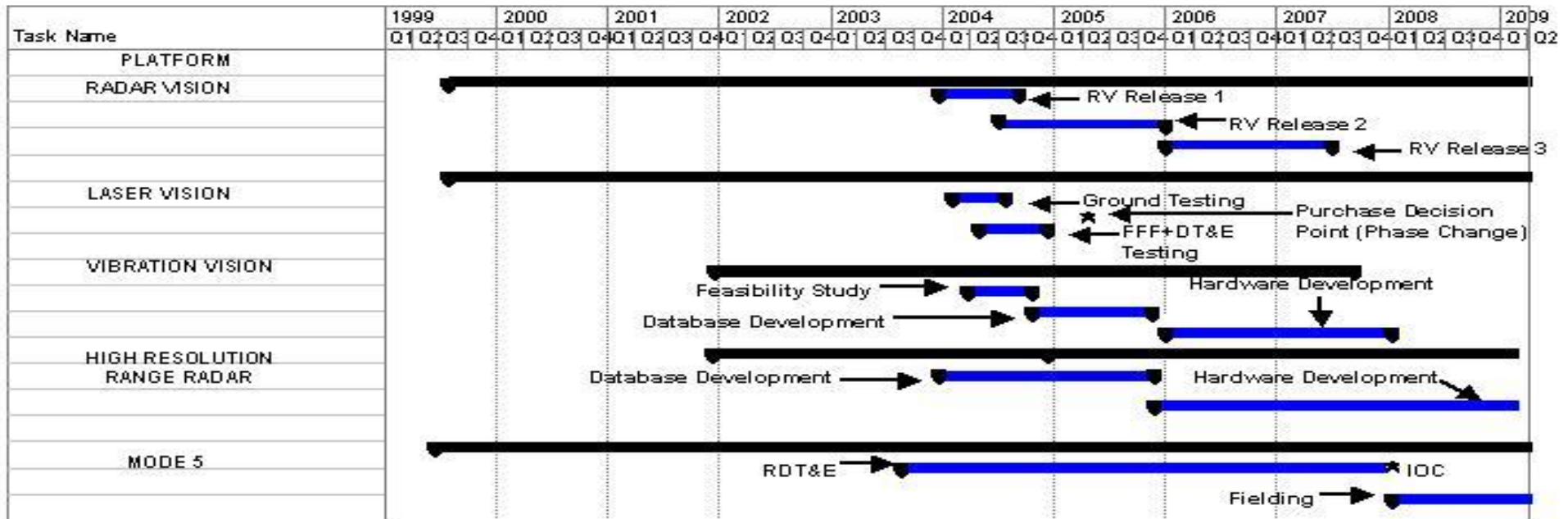
February 2004

BUDGET ACTIVITY  
**04 Advanced Component Development and Prototypes (ACD&P)**

PE NUMBER AND TITLE  
**0603742F Combat Identification Technology**

PROJECT NUMBER AND TITLE  
**2597 Noncooperative Identification Subsystems**

## Combined Schedules and Milestones



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Exhibit R-4a, RDT&E Schedule Detail		DATE <b>February 2004</b>		
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT NUMBER AND TITLE		
<b>04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>0603742F Combat Identification Technology</b>	<b>2597 Noncooperative Identification Subsystems</b>		
		<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
(U) <b>Schedule Profile</b>				
(U) 1. HRR Classifier Dev/Qual				4Q
(U) Technique Selection for Model Creation		1Q		
(U) Completion of 150 Feature Quality Models		3Q		
(U) Start of Lab-based Model Validation		2Q		
(U) Completion of Lab Validation		4Q		
(U) Comp of 6 High-Fidelity NAIC Models			3Q	
(U) Denied Target Study/Initial Production				4Q
(U) 2. LASER VISION (flt test of ERASER technology)				4Q
(U) Completion of Lab Demos			1Q	
(U) Phase II, Part III Contract Modification			1Q	
(U) Tower Demonstrations			2Q	
(U) Mountaintop Demo			2Q	
(U) Flight Testing			3Q	
(U) Completion of Phase II			4Q	
(U) Start of SDD			4Q	
(U) 3. RADAR VISION (Lab and Flight Demo of air-ground radar imaging technology)				4Q
(U) Complete laboratory demonstration/evaluation of three algorithms				2Q
(U) Complete flight demonstration of AGRI algorithm			3Q	
(U) Modeling tool development			4Q	
(U) Build additional target models			4Q	
(U) Analysis of surrogate data sources				2Q
(U) 4. Vibration Vision Analysis				4Q
(U) 5. AIMSPO Integration and Certification Support				4Q
(U) AN/APX-117, 118, & 119 IFF Systems Certified			4Q	
(U) AN/TPX-56 IFF System Certified			4Q	
(U) AN/UPX-37 IFF System Certified				1Q
(U) Complete AN/APX-113, 114 Certification				3Q
(U) Complete ATCBI-6 Certification				3Q
(U) C-35, C-40 IFF Integration Support Completed			4Q	
(U) Mode V Engineering Specification Comp				1Q
(U) F-35 IFF Integration Support Started				4Q
(U) F-15, F-16 IFF Integration Support Started				4Q



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<b>Exhibit R-4a, RDT&amp;E Schedule Detail</b>		DATE <b>February 2004</b>
<b>BUDGET ACTIVITY</b> <b>04 Advanced Component Development and Prototypes (ACD&amp;P)</b>	<b>PE NUMBER AND TITLE</b> <b>0603742F Combat Identification Technology</b>	<b>PROJECT NUMBER AND TITLE</b> <b>2597 Noncooperative Identification Subsystems</b>
(U) F-22 IFF Integration Support Started		4Q
(U) 6. Integrated Management Team		4Q
(U) Air-to-Air CID Tech Roadmap Update		1Q
(U) Air-to-Ground CID Tech Roadmap Update		1Q
(U) Complete Mode V Acquisition Strategy		4Q
(U) Start Mode V Fielding Support		1Q
(U) Start Mode V IFF Flight Demo Planning and Support		2Q
(U) 7. CID Studies and Demos		4Q
(U) AFSAA Analysis of Alternative Start		3Q
(U) AFSAA AoA Completion		1Q