

## UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE <b>June 2001</b>		
BUDGET ACTIVITY <b>04 - Demonstration and Validation</b>					PE NUMBER AND TITLE <b>0603742F Combat Identification Technology</b>					PROJECT <b>2597</b>	
COST (\$ in Thousands)		FY 2000 Actual	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
2597	Noncooperative Identification Subsystems	6,434	10,832	11,523	12,528	17,122	20,170	20,609	21,066	Continuing	TBD
Quantity of RDT&E Articles		0	0	0	0	0	0	0	0	0	0

FY03-FY07 budget numbers do not reflect the DoD Strategic Review results.

(U) **A. Mission Description**  
 U.S. Combat Air Forces have a critical requirement to positively identify enemy, friendly, and neutral aircraft and battlefield equipment. The Combat Identification (CID) Capstone Requirements Document was approved by the JROC on 19 Mar 01 and clearly states this need. Multiple other Joint MNS, Air Force ORDs, and NATO requirements documents also state CID operational needs. High confidence & high probability of ID, all weather & day/night operational needs as well as timely and reliable CID will reduce fratricide, improve combat effectiveness, and enable battlespace commanders to effectively manage and control their forces.

The Combat ID Technology program element investigates (studies & analyses), develops, demonstrates, and transitions (to EMD) promising target identification technologies. These technologies include both cooperative and non-cooperative techniques that improve our ability to positively identify ground and air targets (i.e. Air/Space-to-Surface, Surface-to-Surface, Surface-to-Air/Space and, Air/Space-to-Air CID).

Examples of promising Air-to-Surface technologies include electro-optical (EO) systems that significantly increase ID ranges, exploitation of vibration signatures to increase probability and confidence of ground target ID and, potential maturation of algorithms to support Automatic Target Cueing and Automatic Target Recognition.

Examples of Air-to-Air technologies include High Range Resolution (HRR) techniques to increase ID ranges as well as confidence and, improvements to the Mark XII system (specifically, implementation of mode V to enable robust, secure Identification Friend or Foe (IFF)

(U) **FY 2000 (\$ in Thousands)**

(U) \$900      Conduct High Range Resolution (HRR) algorithm validation, continue synthetic target database development, initiate transition of the synthetic target database to Air Force Information Warfare Center (AFIWC) and National Air Intelligence Center (NAIC) in preparation for fielding of the HRR capability and provide test support.

(U) \$4,295      Continue development and demonstration of promising air-to-ground identification techniques for reduced battlefield fratricide and enhanced mission performance, including the ERASER program. Begin implementation of the Laser Vision program to demonstrate 2-D eyesafe laser imaging (ERASER) technology on an operational fighter targeting pod. Laser Vision is a continuation of the development of the enhanced

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04 - Demonstration and Validation	0603742F Combat Identification Technology	2597
(U) <u>A. Mission Description Continued</u>		
(U) <u>FY 2000 (\$ in Thousands) Continued</u>		
	mission performance for the ERASER program.	
(U) \$354	Fund AIMS (Air Traffic Control Radar Beacon System, Identification Friend or Foe, Mark XII System) Program Office support of DoD Mark XII configuration control and next generation IFF (Identification, Friend or Foe) equipment integration with current IFF capabilities.	
(U) \$885	Provide for CID Integrated Management Team and engineering support for integration and management of Air Force CID programs, conducting related studies/demos to increase warfighter's CID capabilities.	
(U) \$6,434	Total	
(U) <u>FY 2001 (\$ in Thousands)</u>		
(U) \$2,494	Perform synthetic target database development in conjunction with the National Air Intelligence Center (NAIC). Conduct HRR algorithm maturation development & demonstration activities, and develop risk assessment and risk mitigation efforts to increase database fidelity.	
(U) \$461	Continue development and demonstration of other promising air-to-ground and air-to-air identification techniques for reduced battlefield fratricide and enhanced mission performance, including the Enhanced Recognition and Sensing Laser Radar (ERASER) program (EO based).	
(U) \$5,632	Continue Laser Vision Phase I to demonstrate 2-D eyesafe laser imaging (ERASER) technology on an operational fighter targeting pod.	
(U) \$320	Fund required AIMS Program Office support of configuration control of Mark XII systems and next generation IFF equipment integration with current IFF (Mode IV) capabilities.	
(U) \$1,240	Provide for CID Integrated Management Team and other engineering support for integration and management of Air Force CID programs.	
(U) \$685	Conduct CID related studies/demos, including those directed by the Joint Staff and OSD, to define higher fidelity requirements, wring out Tactics Techniques, and Procedures (TTPs) as they apply to new technologies, and otherwise analyze ways to increase warfighter's CID capabilities.	
(U) \$10,832	Total	
The following net transactions are not reflected in the FY01 program total: SBIR = -\$335K.		
(U) <u>FY 2002 (\$ in Thousands)</u>		
(U) \$2,950	Continue the HRR synthetic target database development in conjunction with NAIC. Implement risk reduction measures to increase the fidelity of the HRR database and prepare to transition database management/maintenance from the lab environment to a SPO.	
(U) \$6,240	Continue development and demonstration of promising air-to-ground and air-to-air identification techniques for reduced battlefield fratricide and enhanced mission performance. Transition program candidates include the continued development and integration of ERASER/Laser Vision, begin baselining associated EO/ATC (Automatic Target Cueing)/ATR (Automatic Target Recognition) capability, begin Multi Vision military utility assessments/trade study to define a transition roadmap for the Joint Airborne Night Navigation and Attack (JOANNA) and related technologies, and continue to mature/harden camera technologies for flight environments. Potential other candidates could include the	
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<p>(U) <b><u>A. Mission Description Continued</u></b></p> <p>(U) <b><u>FY 2002 (\$ in Thousands) Continued</u></b></p> <p style="padding-left: 40px;">Air-to-Ground Imaging (AGRI) technology.</p> <p>(U) \$730 Fund AIMS Program Office support of Mark XII systems to include next generation IFF equipment integration, including Mode V documentation and individual IFF system/box certification.</p> <p>(U) \$775 Provide for CID Integrated Management Team and other engineering support for integration and management of Air Force CID programs.</p> <p>(U) \$828 Conduct CID related studies/demos and conferences. Studies/demos will include those directed by the Joint Staff and OSD, to define higher fidelity requirements, wring out Tactics Techniques, and Procedures (TTPs) as they apply to new technologies, and otherwise analyze ways to increase warfighter's CID capabilities.</p> <p>(U) \$11,523 Total</p> <p>(U) <b><u>B. Budget Activity Justification</u></b></p> <p style="padding-left: 40px;">This program is in Budget Activity 4 - The PE includes advanced technology demonstrations that help transition technologies from laboratory to operational use.</p> <p>(U) <b><u>C. Program Change Summary (\$ in Thousands)</u></b></p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 55%;"></th> <th style="width: 10%; text-align: center;"><u>FY 2000</u></th> <th style="width: 10%; text-align: center;"><u>FY 2001</u></th> <th style="width: 10%; text-align: center;"><u>FY 2002</u></th> <th style="width: 15%; text-align: center;"><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>(U) Previous President's Budget (FY 2001 PBR)</td> <td style="text-align: center;">7,334</td> <td style="text-align: center;">10,933</td> <td style="text-align: center;">11,495</td> <td></td> </tr> <tr> <td>(U) Appropriated Value</td> <td style="text-align: center;">7,334</td> <td style="text-align: center;">10,933</td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Appropriated Value</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">a. Congressional/General Reductions</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">b. Small Business Innovative Research</td> <td style="text-align: center;">-222</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">c. Omnibus or Other Above Threshold Reprogram</td> <td style="text-align: center;">-163</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">d. Below Threshold Reprogram</td> <td style="text-align: center;">-486</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">e. Rescissions</td> <td style="text-align: center;">-29</td> <td style="text-align: center;">-101</td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Budget Years Since FY 2001 PBR</td> <td></td> <td></td> <td style="text-align: center;">28</td> <td></td> </tr> <tr> <td>(U) Current Budget Submit/FY 2002 PBR</td> <td style="text-align: center;">6,434</td> <td style="text-align: center;">10,832</td> <td style="text-align: center;">11,523</td> <td style="text-align: center;">TBD</td> </tr> </tbody> </table> <p>(U) <b><u>Significant Program Changes:</u></b></p> <p style="padding-left: 40px;">No significant program changes.</p>					<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>Total Cost</u>	(U) Previous President's Budget (FY 2001 PBR)	7,334	10,933	11,495		(U) Appropriated Value	7,334	10,933			(U) Adjustments to Appropriated Value					a. Congressional/General Reductions					b. Small Business Innovative Research	-222				c. Omnibus or Other Above Threshold Reprogram	-163				d. Below Threshold Reprogram	-486				e. Rescissions	-29	-101			(U) Adjustments to Budget Years Since FY 2001 PBR			28		(U) Current Budget Submit/FY 2002 PBR	6,434	10,832	11,523	TBD
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BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT	
<b>04 - Demonstration and Validation</b>					<b>0603742F Combat Identification Technology</b>					<b>2597</b>	
<b>(U) D. Other Program Funding Summary (\$ in Thousands)</b>											
	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</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>Estimate</u>	<u>Complete</u>		
(U) None	0	0	0	0	0	0			0	0	
<b>(U) E. Acquisition Strategy</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. FY02 activities are a continuation of FY01 efforts.											
<b>(U) F. Schedule Profile</b>											
		<u>FY 2000</u>				<u>FY 2001</u>			<u>FY 2002</u>		
	1	2	3	4	1	2	3	4	1	2	3
(U) 1. (U) HRR Platform Suite Efforts											
(U) Radar Enhancement Test Completion			*								
(U) DT&E Completion					X						
(U) OT&E Completion							X				
(U) 2. (U) HRR Classifier Dev/Qual											
(U) Denied Target Process Validation										X	
(U) Threat Target Build								X			
(U) AFRL Target Build								X			
(U) Stores Configuration Assessment											
(U) Data Collection Complete								X			
(U) Synthesis Production										X	
(U) Unknown Target Process											
(U) Initial Assessment								*			
(U) 3. (U) ERASER											
(U) Contract Award											
(U) Systems Requirements Review											
(U) Ground Based Demo of Flight H/W			*								
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## RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

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04 - Demonstration and Validation

0603742F Combat Identification Technology

2597

(U) F. Schedule Profile Continued

		<u>FY 2000</u>				<u>FY 2001</u>				<u>FY 2002</u>			
		1	2	3	4	1	2	3	4	1	2	3	4
(U)	Flight Demo of 1.06 micron system				*	*							
(U)	4. (U) LASER VISION												
(U)	Industry Days	*											
(U)	RFP Release	*											
(U)	Contract Award(s)		*										
(U)	System Integration & Ground Tests				*	*							
(U)	Flight Demo with Targeting Pod(s) & Analysis					*	*		*				
(U)	Start EO/ATC/ATR baselining effort												X
(U)	Integration Activity Start										X		
(U)	Camera Development						*	*	X	X	X		
(U)	5. MULTI VISION TRADE STUDY								X	X	X	X	

\* denotes completed events

X denotes planned events

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE June 2001			
BUDGET ACTIVITY					PE NUMBER AND TITLE				PROJECT	
04 - Demonstration and Validation					0603742F Combat Identification Technology				2597	
(U) <u>A. Project Cost Breakdown (\$ in Thousands)</u>										
						<u>FY 2000</u>		<u>FY 2001</u>		<u>FY 2002</u>
(U)	Analysis/Modeling and Simulation, Studies, Plans and Reports					0		517		828
(U)	Data Synthesis, Algorithm Development, Database Support					900		2,494		2,950
(U)	Hardware/Software and Prime Mission Product Development					3,985		2,743		6,240
(U)	IFF Equip Config Control, Certification & Integration Support					354		320		730
(U)	CID Training, Travel, & Operations					885		1,408		775
(U)	Flight Test					310		3,350		0
(U)	Total					6,434		10,832		11,523
(U) <u>B. Budget Acquisition History and Planning Information (\$ in Thousands)</u>										
(U) <u>Performing Organizations:</u>										
<u>Contractor or</u>	<u>Contract</u>									
<u>Government</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Performing</u>	<u>Project</u>						
<u>Performing</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 2000</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Organizations</u>										
Raytheon Co, El Segundo CA	CPFF	Nov 98	12,625	12,625	0	0	900	860	Continuing	TBD
Veridian (Veda) Dayton, OH	CPFF	Aug 98	13,000	13,000	0	475	473	200	Continuing	TBD
Simulation Support, Inc.	CP	May 99	330	330	0	0	0	0	330	330
National Air Intel Center	AF616	Annually	3,329	3,329	3,329	0	0	0	0	3,329
Northrop Grumman Corp	CPFF	Aug 93	2,270	2,270	1,956	0	0	0	Continuing	TBD
ERASER-Raytheon, Plano TX	CPFF	Dec 97	5,532	5,532	1	970	461	1,000	Continuing	TBD
Raytheon Co, El Segundo	OTA	Mar 00	1,100	1,100	0	950	150	1,333	Continuing	TBD
Lockheed Martin, Orlando	OTA	Mar 00	1,100	1,100	0	950	150	1,334	Continuing	TBD
Northrup Grumman, Rolling Meadows, IL	OTA	Mar 00	1,100	1,100	0	950	150	1,333	Continuing	TBD
Demaco	CPFF	Aug 94	9,004	9,004	6,604	0	0	0	0	6,604
SAIC (Demaco, Inc)	CPFF	May 99	2,210	2,210	0	475	0	500	Continuing	TBD
Cyberdynamics	CPFF	May 99	2,112	2,112	0	0	0	0	2,112	2,112
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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)									DATE	
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BUDGET ACTIVITY				PE NUMBER AND TITLE					PROJECT	
04 - Demonstration and Validation				0603742F Combat Identification Technology					2597	
(U) <u>Performing Organizations Continued:</u>										
<u>Product Development Organizations</u>										
AIMS Program Office	MIPR	Annual	N/A	N/A	634	354	320	730	Continuing	TBD
Wright Laboratory (Camera & ATR development)	MIPR	Jan 01	N/A	N/A	0	0	2,000	1,809	Continuing	TBD
Wright Laboratory (LV)	MIPR	N/A	N/A	N/A	0	160	1,353	0	Continuing	TBD
<u>Support and Management Organizations</u>										
USAF Combat ID IMT and Engineering Support	Various	N/A	N/A	N/A	2,850	780	1,465	842	Continuing	TBD
Wright Laboratory (HRR)	MIPR	N/A	4,000	4,000	2,332	50	60	70	Continuing	TBD
FT Belvoir	MIPR	N/A	N/A	N/A	0	10	0	0	0	10
<u>Test and Evaluation Organizations</u>										
3246th Test Wing, Eglin AFB,Mixed, CPF, FL 544th Range Group, Nellis AFB, NV		N/A	3,769	3,769	2,319	0	1,350	1,512	Continuing	TBD
412 Test Wing, Edwards AFB	MIPR	N/A	1,605	1,605	0	310	2,000	0	Continuing	TBD
					<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Subtotals</u>					<u>to FY 2000</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>Complete</u>	<u>Program</u>
Subtotal Product Development					12,524	5,284	5,957	9,099	TBD	TBD
Subtotal Support and Management					5,182	840	1,525	912	TBD	TBD
Subtotal Test and Evaluation					2,319	310	3,350	1,512	TBD	TBD
Total Project					20,025	6,434	10,832	11,523	TBD	TBD