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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force **Date:** April 2022

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603742F / <i>Combat Identification Technology</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	25.824	21.939	17.318	0.000	17.318	24.119	24.611	25.092	25.651	Continuing	Continuing
642597: <i>Noncooperative Identification Subsystems</i>	-	13.544	19.283	15.174	0.000	15.174	21.392	21.790	22.251	22.746	Continuing	Continuing
642599: <i>Cooperative Identification Techniques</i>	-	6.080	0.000	0.070	0.000	0.070	0.076	0.119	0.083	0.085	Continuing	Continuing
643420: <i>Combat ID Database Development</i>	-	6.200	2.656	2.074	0.000	2.074	2.651	2.702	2.758	2.820	Continuing	Continuing

A. Mission Description and Budget Item Justification

Combat Identification is the process of determining the identity of an entity in the battlespace. It is essential to determine if that entity is a friend, neutral or enemy; and if an enemy, the nature of the entity determines how it should be engaged. The Combat Identification team's mission is to identify new and promising technology candidates, evaluate the usefulness of the technologies, conduct demonstrations in operationally relevant environments, and coordinate strategies that expedite transition to more than one platform. This Program Element aims to integrate and transition new capabilities into fielded systems, and improve existing capabilities. The mission area consists of three projects: non-cooperative Combat Identification, cooperative Combat Identification, and Combat Identification database development.

Non-cooperative Combat Identification techniques do not depend on a response from the targeted platform - such as high range resolution radar that measures the length of a target. Cooperative Combat Identification systems require communication between two participating platforms. Combat Identification database development matures techniques to ensure target representations in the database enable the algorithms to perform correctly. Both non-cooperative and cooperative Combat Identification techniques are currently in the field, and are necessary elements of the kill chain that ensure mission success and reduce fratricide.

Activities also include studies and analysis to support both current program planning and execution and future program planning.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Combat Identification technologies. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F.

This effort is in Budget Activity 4, Advanced Component Development and Prototypes (ACD&P), because efforts are necessary to evaluate integrated technologies, representative modes or prototype systems in a high fidelity and realistic operating environment.

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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603742F / <i>Combat Identification Technology</i>
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B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	26.348	21.939	0.000	0.000	0.000
Current President's Budget	25.824	21.939	17.318	0.000	17.318
Total Adjustments	-0.524	0.000	17.318	0.000	17.318
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-0.002	0.000			
• SBIR/STTR Transfer	-0.522	0.000			
• Other Adjustments	0.000	0.000	17.318	0.000	17.318

Change Summary Explanation

Decrease in FY 2021 reflects reprogramming to support Research and Development Projects, 10 U.S.C. Section 2363, an amendment to PL 110-417, 10 U.S.C. Section 2358 and 10 U.S.C. 2805(d)(1)(B).

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force										Date: April 2022		
Appropriation/Budget Activity 3600 / 4					R-1 Program Element (Number/Name) PE 0603742F / <i>Combat Identification Technology</i>				Project (Number/Name) 642597 / <i>Noncooperative Identification Subsystems</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
642597: <i>Noncooperative Identification Subsystems</i>	-	13.544	19.283	15.174	0.000	15.174	21.392	21.790	22.251	22.746	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Non-cooperative combat identification (CID) employs a number of sensing technologies and signal processing techniques designed to extract discriminating features from a battlespace entity (target). Specifically-designed algorithms compare those extracted features to a tailored database to identify those targets. These technologies include: (A) non-cooperative Air Target Identification (ATID) technologies, (B) non-cooperative Ground Target Identification (GTID) technologies, and (C) Studies and Analysis, evaluating potential new technologies.

Air Target Identification (ATID) technology developments currently focus on development and implementation of the Joint Multi-platform Advanced Combat identification (JMAC) architecture, which is a framework that allows multiple sensors to provide a robust combat identification solution; and efforts aimed at the discovery and generation of features from fielded sensors to supply data to Joint Multi-platform Advanced Combat identification. Joint Multi-platform Advanced Combat identification is evolving into the primary Department of Defense air target identification architecture.

Ground Target Identification (GTID) efforts are currently focused on transitioning a combat identification capability for denied access environments using passive radio frequency and electronic warfare information, integrating radio based technologies into the cockpit to increase confidence of target identification and situational awareness as well as reduce fratricides, and to demonstrate weapon-based combat identification back to the launch platform using a communication link from that launched weapon. Ground Target Identification is also developing technology to address efficiency and sustainability issues associated with the development, operation and maintenance of non-cooperative monostatic and bi-static synthetic aperture radar (SAR) aided target recognition (ATR) algorithms and databases.

Studies and Analysis discovers novel technologies that are ready to become transitionable projects, and includes Enhanced Combat ID (ECID), an activity to develop a robust ability to quantitatively evaluate promising combat identification technologies using enhanced modeling and simulation capabilities. The Studies and Analysis effort also performs early assessments of promising technologies through Concept Calls to determine if the program should incorporate them as a formal project within the combat identification portfolio.

Activities also include studies and analysis to support both current program planning and execution and future program planning.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Combat Identification technologies. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, and 0605898F.

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Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603742F / <i>Combat Identification Technology</i>	Project (Number/Name) 642597 / <i>Noncooperative Identification Subsystems</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>Title: Laser Vision</p> <p>Description: The Vibrometry Advanced Mode Processor effort develops advanced algorithms for processing data provided by laser vibrometry sensors to demonstrate prototype pilot Aided Target Recognition software. This leverage ability of active electro-optic sensors to sense micro-displacements of operating machinery to measure the resulting frequency spectrum. The effort will assess utility for air-to-ground Combat Identification and will apply Aided Target algorithms to determine how well the technology can separate target classes.</p> <p>Laser Vision uses electro-optical systems to significantly increase target identification ranges. It provide the demonstration and evaluation data necessary to support decisions on future electro-optical technologies supporting combat identification, including 3-dimensional imaging, laser vibrometry and synthetic aperture ladar.</p> <ul style="list-style-type: none"> - The 3-Dimensional Targeting Operations project provides 3-dimensional data to Aided Target Recognition algorithms for high confidence combat identification, and has high potential for the next generation of targeting pods for the Air Force. - The Vibration Advanced Mode Processor effort develops advanced algorithms for processing data provided by laser vibrometry sensors to demonstrate prototype Aided Target Recognition. This leverages the ability of active electro-optical sensors to sense micro-displacement of operating machinery to measure the resulting frequency spectrum. The effort will assess the utility for air-to-ground combat identification and will apply Aided Target Recognition algorithms to determine how well the technology can separate target classes. - The Multi-Mode Ladar Aided Target Recognition project combines 3-dimensional laser imaging with laser vibrometry and synthetic aperture ladar to create a longer-range fused-feature combat identification technique that uses the combined orthogonal features of each modality to provide a robust long-range combat identification capability. <p>Per the direction of the Combat Identification Senior Advisory Group, Laser Vision activities were put into a hibernation state starting in FY 2022; Vibrometry Advanced Mode. Processor and 3-Dimensional Targeting Operations were completed as scheduled and are ready to transition CID capability to Litening.</p> <p>FY 2022 Plans: Effort was be completed in FY 2021, thus no additional funding is required.</p> <p>FY 2023 Plans:</p>		2.100	0.000	0.000

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Not applicable				
FY 2022 to FY 2023 Increase/Decrease Statement: Not applicable				
Title: Hydra Vision/Air to Air		2.778	3.943	0.000
Description: Hydra Vision Air-to-Air project discovers, matures and integrates features collected from any battlespace sensor into the Joint Multiplatform Advanced Combat identification (JMAC) air target CID architecture, and transitions the mode to tactical aircraft.				
FY 2022 Plans: Hydravision Air-to-Air will implement and demonstrate Joint Multi-platform Advanced Combat identification (JMAC) in an F-16 testbed aircraft. The project will also begin a demonstration project for inserting JMAC into an F-15. The Integrated Combat identification with Electronic warfare project will add electronic warfare features into the JMAC architecture for outyear maturation and demonstration.”				
FY 2023 Plans: Starting in FY 2023, this work is performed under Project 642597, Noncooperative Identification Subsystems, Air Target Identification (ATID) effort.				
FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 decreased compared to FY 2022 by \$3.943 million. Justification for this decrease is due to realignment of funding to Project 642597, Noncooperative Identification Subsystems, Air Target Identification (ATID) effort.				
Title: Compact Aided Target Recognition and Sustainable Environment (CASE)		0.700	0.950	0.000
Description: Compact Aided Target Recognition and Sustainable Environment is a family of efforts to address efficiency and sustainability issues associated with the development, operation and maintenance of non-cooperative Aided Target Recognition technology. Develop sustainable multi-phenomenology Aided Target Recognition based on low fidelity, compact, and inexpensive database technology.				
FY 2022 Plans: This effort will investigate the viability of using machine learning algorithms to continue to provide Combat Identification ranges for ground targets, but less is needed. Conduct verification/validation and analysis of data collected during FY 2021.				
FY 2023 Plans:				

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Starting in FY 2023, this work is performed under Project 642597, Noncooperative Identification Subsystems, Ground Target Identification (GTID) effort. FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 decreased compared to FY 2022 by \$0.950 million. Justification for this decrease is due to realignment of funding to Project 642597, Noncooperative Identification Subsystems, Ground Target Identification (GTID) effort.				
Title: Passive Radio Frequency Identification Environment (PRIDE) Description: Develop passive Radio Frequency target Identification capability for denied access environment utilizing passive Radio Frequency and Electronic Warfare information with potential non-traditional Intelligence, Surveillance and Reconnaissance capabilities. FY 2022 Plans: This effort will develop an Identification capability useful in a denied access environment using passive Radio Frequency and Electronic Warfare (EW) information. Efforts require less for data collection activities in FY 2022. FY 2023 Plans: Starting in FY 2023, this work is performed under Project 642597, Noncooperative Identification Subsystems, Ground Target Identification (GTID) effort. FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 decreased compared to FY 2022 by \$4.123 million. Justification for this decrease is due to realignment of funding to Project 642597, Noncooperative Identification Subsystems, Ground Target Identification (GTID) effort.		2.281	4.123	0.000
Title: Radio ID (RID) Description: Radio Identification will develop technologies to integrate radio based cooperative technologies with non-cooperative technologies into the cockpit. The benefits will be increased confidence target identification and situational awareness as well as reduced fratricides. FY 2022 Plans: This effort will develop methods for using advances in software defined radios to provide enhanced Combat Identification solutions and improve aircrew situational awareness. Initial development will give way to a lab demonstration with smaller funding requirements. FY 2023 Plans:		2.387	3.000	0.000

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Starting in FY 2023, this work is performed under Project 642597, Noncooperative Identification Subsystems, Ground Target Identification (GTID) effort. FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 decreased compared to FY 2022 by \$3.000 million. Justification for this decrease is due to realignment of funding to Project 642597, Noncooperative Identification Subsystems, Ground Target Identification (GTID) effort.				
Title: Studies Description: The studies effort serves to analyze Automatic Target Recognition algorithm performance and technology investment needs. Furthermore the studies effort covers low Technical Readiness Level (TRL 4) efforts which have been funded through the Combat Identification Concept Call. FY 2022 Plans: In FY 2022 efforts will continue modeling, simulation and analysis of Combat Identification technologies and also new Concept Call technology development. FY 2023 Plans: Continues to conduct Combat Identification related studies and demonstrations. FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 decreased compared to FY 2022 by \$2.363 million. Justification for this decrease is due to reduced emphasis on Concept Call efforts.		2.281	4.267	1.904
Title: Kill-chain Weapon Integrated CID (KWIC) Description: Kill-chain Weapons Integrated Combat Identification will use air to ground sensors to provide better situational awareness and Combat Identification of target area FY 2022 Plans: Continue with feature extraction and algorithm development. FY 2023 Plans: Starting in FY 2023, this work is performed under Project 642597, Noncooperative Identification Subsystems, Ground Target Identification (GTID) effort. FY 2022 to FY 2023 Increase/Decrease Statement:		1.017	3.000	0.000

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
FY 2023 decreased compared to FY 2022 by \$3.000 million. Justification for this decrease is due to realignment of funding to Project 642597, Noncooperative Identification Subsystems, Ground Target Identification (GTID) effort.				
<p>Title: Air Target Identification (ATID)</p> <p>Description: The Air Target Identification project discovers, matures and integrates features collected from any battlespace sensor into the Joint Multiplatform Advanced Combat Identification (JMAC) air target data-fusion architecture, and transitions the mode to tactical aircraft. Air Target Identification efforts include: (1) Air-to-Air Hydra Vision (AAHV), developing methods to extract and exploit features from fielded sensors to provide data to Joint Multiplatform Advanced Combat Identification; (2) F-16 Joint Multiplatform Advanced Combat Identification Open Mission System (OMS) Rapid Development (FJORD), the effort to demonstrate Joint Multiplatform Advanced Combat Identification on the F-16; (3) F-15 Joint Multiplatform Advanced Combat Identification (JMAC-15), investigating transition of Joint Multiplatform Advanced Combat Identification into the F-15E/EX fleet; and (4) Integrated Combat identification and Electronic warfare (ICE), which incorporates features extracted from an electronic warfare suite to enhance the Joint Multiplatform Advanced Combat Identification solution.</p> <p>FY 2022 Plans: Not applicable</p> <p>FY 2023 Plans: Demonstrate feature extraction algorithms within the Joint Multiplatform Advanced Combat ID (JMAC) construct in concert with the Army Aviation and Missile Center (AvMC) and Missile Defense Agency (MDA) through F-16 testbed flights. Leverage Combat Identification sensor vendors to continue developing advanced data extraction algorithms. With sensor feature extraction algorithms maturing, the Joint Multiplatform Advanced Combat Identification - 15 (JMAC-15) effort will complete System Integration Laboratory tests of Joint Multiplatform Advanced Combat ID in FY 2023 to prepare for F-15 flight tests in FY 2024.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 increased compared to FY 2022 by \$7.587 million. Justification for this increase is due to realignment of funding from Project 642597, Noncooperative Identification Subsystems, Hydra Vision / Air to Air effort.</p>		-	0.000	7.587
<p>Title: Ground Target Identification (GTID)</p> <p>Description: Ground Target Identification technologies consist of (1) Compact Aided target recognition (ATR) and Sustainable Environments (CASE), an approach that focuses on tailoring algorithms to use small, efficient databases that are relatively affordable to generate and maintain; (2) Passive Radio-frequency IDentification Environment (PRIDE), an effort to develop a bistatic synthetic aperture radar (SAR) automatic target recognition (ATR) capability useful in a denied access environment; (3) Radio Identification (RID), an effort to develop methods (including machine learning and artificial intelligence algorithms) paired with advances in software defined radios to provide ground emitter ID to improve aircrew situational awareness; and (4) Kill-chain</p>		-	0.000	5.683

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>Weapon Integrated CID (KWIC), an effort that will use information from launched weapons through a back channel communication link to provide CID from within the hot battlespace.</p> <p>FY 2022 Plans: Not applicable</p> <p>FY 2023 Plans: Focus tech development toward identification of targets in camouflage, concealment, denial and decoy conditions. This effort will look at sensor modes and sensor fusion to provide technical solutions to this critical challenge. Passive Radio Frequency Identification Environment will finish Phase 2 efforts with an offline demonstration in Phase 2 and will ramp up for Phase 3.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 increased compared to FY 2022 by \$5.683 million. Justification for this increase is due to realignment of funding from Project 642597, Noncooperative Identification Subsystems, Compact Aided Target Recognition and Sustainable Environment (CASE) effort, Passive Radio Frequency Identification Environment (PRIDE) effort, Radio ID (RID) effort, and Kill-chain Weapon Integrated CID (KWIC) effort.</p>				
Accomplishments/Planned Programs Subtotals		13.544	19.283	15.174
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
<p>Combat Identification develops technologies for exploitation by the United States Air Force and other services. Award multiple, competitive contract vehicles emphasizing off-the-shelf technology and maximizing the use of non-developmental items (NDIs). Management develops a technology to a point it can be demonstrated in a relevant combat environment.</p>				

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force **Date:** April 2022

Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603742F / <i>Combat Identification Technology</i>	Project (Number/Name) 642597 / <i>Noncooperative Identification Subsystems</i>
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Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Hydra Vision (Air-to-Air) - L	C/CPFF	Leidos : Dayton, OH	-	1.000	Jan 2021	0.603	Jan 2022	-		-		-	Continuing	Continuing	-
Hydra Vision (Air-to-Air) - T	C/CPAF	TBD : TBD	-	-		1.370	Feb 2022	-		-		-	Continuing	Continuing	-
Air Target ID	C/CPAF	TBD : TBD	-	-		-		3.063	Feb 2023	-		3.063	Continuing	Continuing	-
Target Recognition & Tracking Technology	MIPR	Sandia : Albuquerque, NM	-	0.600	Feb 2021	0.400	Oct 2021	-		-		-	Continuing	Continuing	-
CASE - Compact AiTR and Sustainable Environment Analysis - L	C/CPFF	Leidos : Dayton, OH	-	1.084	Jan 2021	0.500	Jan 2022	-		-		-	Continuing	Continuing	-
Passive Radar Identification Environment (PRIDE) - L	C/CPFF	Leidos : Mclean, VA	-	1.000	Oct 2020	2.700	Oct 2021	-		-		-	Continuing	Continuing	-
GTID - Passive Radar Identification Environment (PRIDE) - L	C/CPAF	Leidos : McLean, VA	-	-		-		0.803	Oct 2022	-		0.803	Continuing	Continuing	-
Radio Identification (RID) L	MIPR	DMEA : Sacramento, CA	-	0.500	Feb 2021	2.100	Feb 2022	-		-		-	Continuing	Continuing	-
GTID - Radio Identification (RID) L	MIPR	DMEA : Sacramento, CA	-	-		-		0.742	Feb 2023	-		0.742	Continuing	Continuing	-
Radio Identification (RID) NG	MIPR	DMEA : Sacramento, CA	-	0.919	Mar 2021	0.900	Feb 2022	-		-		-	Continuing	Continuing	-
GTID - Radio Identification (RID) NG	MIPR	DMEA : Sacramento, CA	-	-		-		0.500	Feb 2023	-		0.500	Continuing	Continuing	-
M2LATR	C/CPFF	TBD : TBD	-	0.500	Mar 2021	0.581	Apr 2022	-		-		-	Continuing	Continuing	-
VAMP	C/CPAF	Northrop Grumman : Rolling Meadows, IL	-	0.350	Jan 2021	-		-		-		-	Continuing	Continuing	-
Infoscitex	C/CPAF	Infoscitex : Dayton, OH	-	0.000	Mar 2021	0.130	Mar 2022	-		-		-	Continuing	Continuing	-
PRECISE-N	C/CPAF	Northrop Grumman : Baltimore, MD	-	0.500	Jan 2021	1.015	Dec 2021	-		-		-	Continuing	Continuing	-
PRECISE-R	C/CPAF	Raytheon : El Segundo, CA	-	1.000	Jan 2021	0.981	Dec 2021	-		-		-	Continuing	Continuing	-

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Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PRECISE-M	C/CPAF	Matrix : Beavercreek, OH	-	0.980	Mar 2021	0.750	Jan 2022	-		-		-	Continuing	Continuing	-
CAST	MIPR	DMEA : Sacramento, CA	-	0.300	Jan 2021	0.200	Jan 2022	-		-		-	Continuing	Continuing	-
Concept Call #1	C/CPAF	TBD : TBD	-	0.400	May 2021	0.200	May 2022	-		-		-	Continuing	Continuing	-
Concept Call #2	MIPR	SANDIA : Albuquerque, NM	-	0.250	May 2021	0.450	May 2022	-		-		-	Continuing	Continuing	-
Studies - Concept Call #2	MIPR	SANDIA : Albuquerque, NM	-	-		-		0.200	May 2023	-		0.200	Continuing	Continuing	-
Concept Call #3	C/CPAF	Not specified. : TBD	-	0.100	May 2021	0.100	May 2022	-		-		-	Continuing	Continuing	-
Concept Call #4	C/CPAF	TBD : TBD	-	-		-		-		-		-	Continuing	Continuing	-
Studies - Concept Call # 4	C/CPAF	TBD : TBD	-	-		-		0.771	May 2023	-		0.771	Continuing	Continuing	-
Concept Call #5	C/CPAF	TBD : TBD	-	-		-		0.000	May 2023	-		0.000	Continuing	Continuing	-
Integrated CID and EW GTRI	C/CPAF	GTRI : Dayton, OH	-	0.400	Jan 2021	0.800	Jan 2022	-		-		-	Continuing	Continuing	-
ATID - Integrated CID and EW GTRI	C/CPAF	GTRI : Dayton, OH	-	-		-		0.800	Jan 2023	-		0.800	Continuing	Continuing	-
Integrated CID and EW NG	C/CPAF	Northrop Grumman : Baltimore, MD	-	0.500	Jan 2021	0.700	Jan 2022	-		-		-	Continuing	Continuing	-
ATID - Integrated CID and EW NG	C/CPAF	Northrop Grumman : Baltimore, MD	-	-		-		1.000	Jan 2023	-		1.000	Continuing	Continuing	-
Integrated CID and EW RTX	C/CPAF	Raytheon : El Segundo, CA	-	-		-		-		-		-	Continuing	Continuing	-
ATID - Integrated CID and EW RTX	C/CPAF	Raytheon : El Segundo, CA	-	-		-		0.284	Jan 2023	-		0.284	Continuing	Continuing	-
Kill Chain Weapons Integrated CID	C/CPAF	Raytheon : El Segundo, CA	-	0.500	Jan 2021	1.500	Jan 2022	-		-		-	Continuing	Continuing	-
ATID - Kill Chain Weapons Integrated CID	C/CPAF	Raytheon : El Segundo, CA	-	-		-		0.500	Jan 2023	-		0.500	Continuing	Continuing	-
AFSIM Development	C/CPAF	TBD : TBD	-	0.300	Feb 2021	0.200	Feb 2022	-		-		-	Continuing	Continuing	-

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Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
ATID - AFSIM Development	C/CPAF	TBD : TBD	-	-		-		0.200	Feb 2023	-		0.200	Continuing	Continuing	-
JMAC Integration	C/CPAF	TBD : TBD	-	0.159	Feb 2021	-		-		-		-	Continuing	Continuing	-
ATID - JMAC Integration	C/CPAF	TBD : TBD	-	-		-		0.600	Nov 2022	-		0.600	Continuing	Continuing	-
XPatch Upgrades	C/CPAF	Leidos : Mclean, VA	-	0.250	Aug 2021	-		-		-		-	Continuing	Continuing	-
Ground Target ID	C/CPAF	TBD : TBD	-	-		-		2.100	Jan 2023	-		2.100	Continuing	Continuing	-
Subtotal			-	11.592		16.180		11.563		-		11.563	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Studies - Systems Engineering Support	C/CPAF	TBD : TBD	-	0.000		-		0.900	Dec 2022	-		0.900	Continuing	Continuing	-
ECID MS&A	C/CPAF	TBD : TBD	-	0.600	Dec 2020	-		-		-		-	Continuing	Continuing	-
Studies - ECID MS&A	C/CPAF	TBD : TBD	-	-		-		0.700	Dec 2022	-		0.700	Continuing	Continuing	-
Subtotal			-	0.600		-		1.600		-		1.600	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test and Evaluation	PO	704TSS : Holloman, NM	-	-		-		-		-		-	Continuing	Continuing	-
Data Collection-AvMC	MIPR	AvMC : Huntsville, AL	-	0.754	Feb 2021	-		-		-		-	Continuing	Continuing	-
Data Collection-Eglin	PO	96th Test Wing : Eglin AFB, FL	-	-		-		-		-		-	Continuing	Continuing	-
Data Collection-Yuma	MIPR	Yuma Proving Ground : Yuma, AZ	-	0.245	Feb 2021	-		-		-		-	Continuing	Continuing	-

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603742F / <i>Combat Identification Technology</i>	Project (Number/Name) 642597 / <i>Noncooperative Identification Subsystems</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Combat Identification Technology</i>				
LASER VISION - VAMP	1	2021	4	2021
LASER VISION - VAMP POD Demo	3	2021	3	2021
LASER VISION - 3D Ladar (3DTO)	1	2021	2	2021
Hydra Vision/FJORD - Air to Air	1	2021	4	2022
Hydra Vision - Air to Air 2 Feature RT Demo	1	2021	4	2022
Hydra Vision - Air to Air 3 Feature RT Demo	4	2021	4	2022
Compact AiTR - Compact Feature AiTR	1	2021	4	2022
Passive RF ID (PRIDE)	1	2021	4	2022
Passive RF ID (PRIDE) - Lab Demo	3	2021	3	2021
Passive RF ID (PRIDE) - OPS Demo	3	2022	4	2022
Radio ID (RID) Integrated CID w/Electronic Warfare (ICE)	1	2021	4	2022
Radio ID n Lab Demo #2 (Jan 2021)	2	2021	2	2021
Radio ID - Flight Demo (Aug 2022)	3	2022	3	2022
Kill Chain Weapons Integration (KWIC)	1	2021	4	2022
Studies	1	2021	4	2027
Air Target Identification (ATID)	1	2023	4	2027
Ground Target Identification (GTID)	1	2023	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force										Date: April 2022		
Appropriation/Budget Activity 3600 / 4					R-1 Program Element (Number/Name) PE 0603742F / <i>Combat Identification Technology</i>				Project (Number/Name) 642599 / <i>Cooperative Identification Techniques</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
642599: <i>Cooperative Identification Techniques</i>	-	6.080	0.000	0.070	0.000	0.070	0.076	0.119	0.083	0.085	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Cooperative Combat Identification employs technologies required to rapidly identify friendly platforms. The program develops, integrates and evaluates technologies that provide Air Force platforms with a means of positively identifying an air or ground platform as a friendly, via active or passive cooperative identification capabilities. The development funded by this project ensures availability of a Mode 5 upgrade path for implementing ground and air platforms across the Air Force fleet. The Department of Defense International AIMSP0 has system level interoperability testing and certification responsibilities for the present Mark XIIB system, development and integration of new Identification Friend or Foe (IFF) system capabilities, and development/integration of civil Mode S capabilities into Mark XIIB Identification Friend or Foe equipment. The AIMSP0 ensures Identification Friend or Foe equipment/platform functionality in accordance with established standards and ensures total system interoperability to meet Department of Defense/Service mission areas (e.g. Offensive Counter Air, Defensive Counter Air, and Integrated Air and Missile Defense).

The cooperative goals will be to test and certify the Mark XIIB system, develop and integrate the new Mark XIIB Identification Friend or Foe system capability (Mode 5 Level 2 Broadcast) and also continue the development/integration of civil Mode S capabilities into Mark XIIB Identification Friend or Foe equipment using newly fielded M-code GPS receivers.. The cooperative funds will be used to fund projects and personnel who develop and test technical standards, perform certification testing, process certifications and track all Office of the Secretary of Defense and Federal Aviation Administration guidelines to ensure the program remains current. The Office of the Secretary of Defense and Federal Aviation Administration guidelines required Mode 5 be fully implemented by FY 2020 but many platforms continue to integrate this capability. The Department of Defense AIMS Program will ensure those certifications are current on all applicable platforms/systems and work with both domestic and foreign military sales partners to ensure compliance. The funds also support Department of Defense representation to several military (United States and NATO) and civil (Federal Aviation Administration, International Civil Aviation Organization and Radio Technical Commission for Aeronautics) requirements meetings for Mode 5, Mode S and ADS-B. These important meetings allow the Department of Defense to remain interoperable with our foreign military partners as well as the United States, and international civil aviation community. Department of Defense AIMS Program will continue to update the Department of Defense AIMS Mark XIIB Standards, Security Classification Guide, Handbook, and Test Requirements.

Cooperative activities include performing studies to evaluate weakness in the Mode 5 Identification Friend or Foe system, and to identify potential paths forward for a new system.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Air Traffic Control and Radar Beacon Systems Identification Friend or Foe Mark XIIB System (AIMS) Program Office	6.080	0.000	0.000
Description: Develop and maintain technical standards on development, integration, testing, and certification of Department of Defense Identification Friend or Foe equipment. Coordinate and execute equipment/subsystem-level certifications and platform			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603742F / <i>Combat Identification Technology</i>	Project (Number/Name) 642599 / <i>Cooperative Identification Techniques</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p>certifications of Identification Friend or Foe capabilities (298 Mode 5 certifications were completed in FY20). Support Foreign Military Sales of the United States Identification Friend and Foe equipment. Currently managing 49 active Foreign Military Sales Cases. Support NATO Identification Friend or Foe Capabilities Team (Mode 5 Identification Friend or Foe is a NATO waveform). Support International Civil Aviation Organization (ICAO) Technical Support Group (develops standards for world-wide civil Air Traffic Control). Create and maintain civil Mode S address assignments and military Mode 5 Platform Identification Number assignments for every Department of Defense platform using these waveforms in their interrogator and/or transponder equipment.</p> <p>FY 2022 Plans: In FY 2022, this work will be performed under PE 0207420F Combat Identification.</p> <p>FY 2023 Plans: Not applicable</p>			
<p>Title: Cooperative Follow-on System</p> <p>Description: Perform studies to evaluate weakness in the Mode 5 Identification Friend or Foe system, and to identify potential paths forward for a new system.</p> <p>FY 2022 Plans: Not applicable</p> <p>FY 2023 Plans: Perform studies to evaluate weakness in the Mode 5 Identification Friend or Foe system, and to identify potential paths forward for the next generation cooperative Identification Friend or Foe system.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 increased by \$0.070 million compared to FY 2022. Justification for this increase is described in plans above.</p>	-	0.000	0.070
Accomplishments/Planned Programs Subtotals	6.080	0.000	0.070

C. Other Program Funding Summary (\$ in Millions) N/A
Remarks
D. Acquisition Strategy Combat Identification develops technologies for exploitation by the United States Air Force and the other services. Award multiple, competitive contract vehicles emphasizing off-the-shelf technology and maximizing the use of non-developmental items (NDIs). Management develops a technology to a point it can be demonstrated in a relative combat environment.

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603742F / <i>Combat Identification Technology</i>	Project (Number/Name) 642599 / <i>Cooperative Identification Techniques</i>

FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
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

Cooperative Identification Techniques	
AIMS Program Office Activities	
AIMS Program Office Annual User Working Group (May 2021)	
Cooperative Follow On System	

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603742F / <i>Combat Identification Technology</i>	Project (Number/Name) 642599 / <i>Cooperative Identification Techniques</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Cooperative Identification Techniques</i>				
AIMS Program Office Activities	1	2021	4	2021
AIMS Program Office Annual User Working Group (May 2021)	3	2021	3	2021
Cooperative Follow On System	1	2023	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force										Date: April 2022		
Appropriation/Budget Activity 3600 / 4					R-1 Program Element (Number/Name) PE 0603742F / <i>Combat Identification Technology</i>				Project (Number/Name) 643420 / <i>Combat ID Database Development</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
643420: <i>Combat ID Database Development</i>	-	6.200	2.656	2.074	0.000	2.074	2.651	2.702	2.758	2.820	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Database Initiative (DBI) is a project designed to remove the "hard-coded" static identification (ID) parameters (typically updated every 4-5 years) from the host platform's sensor(s) and replace them with parameterized values that are easily and quickly updated when new intelligence inputs come available (this allows maximum flexibility to tailor each aircraft's Combat Identification database(s) based on assigned theater of operation, threat country of interest, and assigned mission tasks). This project primarily consists of four objectives: A.) determining a sensor's requisite identification parameters for combat identification, B) designing and developing a database to contain the combat identification parameters identified in Objective A, C) developing techniques to generate the requisite parameters, and D) provide combat identification parameters developed from measured or modeled data.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Combat Identification technologies. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F.

This effort is in Budget Activity 4, Advanced Component Development and Prototypes (ACD&P), because efforts are necessary to evaluate integrated technologies, representative modes or prototype systems in a high fidelity and realistic operating environment.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Database Development	6.200	2.656	2.074
Description: Develop techniques to remove the "hard-coded" static ID parameters from the host platform's sensor and replace them with parameterized values that are dynamic.			
FY 2022 Plans: Continue to collect data to populate the high range resolution radar (HHR) and non-cooperative target recognition (NCTR) databases for developmental test/debug. Develop techniques to remove the "hard-coded" static ID parameters from the host platform's sensor and replace them with parameterized values for Joint Multi-sensor Advanced Combat Identification (JMAC) architecture.			
FY 2023 Plans: Continue to collect data to populate the databases for developmental test/debug. Continue to develop techniques to remove the "hard-coded" static ID parameters from the host platform's sensor and replace them with parameterized values for Joint Multi-			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022		
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603742F / <i>Combat Identification Technology</i>	Project (Number/Name) 643420 / <i>Combat ID Database Development</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
sensor Advanced Combat Identification (JMAC) architecture. Add a new feature into the Joint Multi-sensor Advanced Combat Identification architecture.				
FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 decreased compared to FY 2022 by \$0.582 million. Justification for this decrease is described in plans above.				
Accomplishments/Planned Programs Subtotals		6.200	2.656	2.074
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
Combat Identification develops technologies for exploitation by the USAF and the other services. Award multiple, competitive contract vehicles emphasizing off-the-shelf technology and maximizing the use of non-developmental items (NDIs). Management develops a technology to a point it can be demonstrated in a relative combat environment.				

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603742F / <i>Combat Identification Technology</i>	Project (Number/Name) 643420 / <i>Combat ID Database Development</i>

FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
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

<i>Combat ID Database Development</i>	
Combat ID Database Development	

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603742F / <i>Combat Identification Technology</i>	Project (Number/Name) 643420 / <i>Combat ID Database Development</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Combat ID Database Development</i>				
Combat ID Database Development	1	2021	4	2027