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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2024 Air Force **Date:** March 2023

<b>Appropriation/Budget Activity</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force I BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0207522F / <i>Airbase Air Defense Systems (ABADS)</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	-	10.526	47.465	78.867	0.000	78.867	10.654	12.938	15.223	15.597	0.000	191.270
640410: <i>Tech Maturation &amp; Risk Reduct</i>	-	10.526	47.465	78.867	0.000	78.867	10.654	12.938	15.223	15.597	0.000	191.270
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

**A. Mission Description and Budget Item Justification**

NOTE: These documents contain an update to the title of the missile defense effort to better communicate the distinction between overarching system and sub-efforts. The new designation is Airbase Air Defense Systems for Missile Defense (ABADS(MD)), instead of Airbase Air Defense Battle Management Command and Control (ABAD BMC2).

The Airbase Air Defense Systems (ABADS) program element is the principal Air Force (AF) program to provide the ability to detect, track, identify, and defeat airborne threats to missions and assets. These threats include small-unmanned aircraft systems (sUAS), Rockets, Artillery and Mortars (RAM), and cruise missiles. These three efforts (missile defense (MD), counter-sUAS (C-sUAS), and counter-RAM (C-RAM)) aim to protect personnel, assets, and infrastructure vital to supporting the national security strategy.

ABADS(MD) is architected as a configurable combination of Commercial Off the Shelf (COTS)/Government Off the Shelf (GOTS) sensor and non-kinetic effector technologies integrated with tailored Battle Management Command and Control (BMC2) software to provide adaptive, resilient, and dedicated air defense capability. The ABADS(MD) system is designed to operate independently or combine with other local and distributed capabilities to form a multi-layered defense-in-depth, improving airbase defense and airbase resiliency.

ABADS(MD) FY24 funding continues to mature the prototype design into a procurement ready system for FY25 fielding. The efforts planned for this fiscal year include continued software development, capability demonstrations, and operational testing during at least one joint exercise. The goal is for the system to meet Air Force requirements leading to a favorable fielding decision.

ABADS(C-sUAS) specifically aims to counter the threats posed by the rapid proliferation of inexpensive yet highly capable systems, and the enemies who target US Service members, Allies, and Coalition partners. The ABADS(C-sUAS) program will continue to analyze evolving threats, evaluate new capabilities, and design an open system architecture that reduces life cycle cost and enables fielding to all 180+ AF installations. ABADS(C-sUAS) features a system of systems approach to integrate sensors and effectors into a robust Command and Control (C2) interface able to detect, track, identify, and defeat sUAS threats. The AF works closely with the DoD Joint C-sUAS Office (JCO) to align annual efforts.

ABADS(C-sUAS) FY24 funding will further develop Command, Control, Communication, Computers, and Intelligence (C4I) systems. The centerpiece of this effort is the Medusa Command and Control (C2) system, whose Modular Open-Systems Architecture enables rapid integration with the Advanced Battle Management System

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(ABMS), Link 16, and Universal Command & Control (UC2). The Medusa C2 system supports Joint All-Domain Command & Control (JADC2) development and employs electronic warfare capabilities, artificial intelligence for operator task automation, a closed-loop training system for operator certification and proficiency, and track fusion.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver weapon system capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program element 0605827F, 0605828F, 0605829F, 0605831F, 0605832F, 0605833F, 0605898F, 0606398F. In FY2022 \$0 was expended for civilian pay expenses in this program element, and in FY2023 \$0 is forecasted for civilian pay expenses in this program element.

This requirement supports performance of a full financial audit as required by title 10 U.S.C. Chapter 9A, Sec 240-D.

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>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024 Base</b>	<b>FY 2024 OCO</b>	<b>FY 2024 Total</b>
Previous President's Budget	10.905	52.498	85.509	0.000	85.509
Current President's Budget	10.526	47.465	78.867	0.000	78.867
Total Adjustments	-0.379	-5.033	-6.642	0.000	-6.642
• Congressional General Reductions	0.000	-5.000			
• 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	0.000	0.000			
• SBIR/STTR Transfer	-0.379	0.000			
• Other Adjustments	0.000	-0.033	-6.642	0.000	-6.642

**Change Summary Explanation**

FY2022 Reduction for SBIR of \$0.379M

FY2023 Reduction for FFRDC of \$0.033M

FY2024 Program Element funding request reduced by \$6.642M to account for the availability of prior year execution balances.

<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>
<b>Title:</b> ABADS(C-sUAS)	10.526	5.330	5.591

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<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>
<p><b>Description:</b> The ABADS(C-sUAS) program will continue to defend against the emerging and growing airborne threats. This program protects strategic assets vital to national security while bedded down and while on the move. This program will continue to counter emerging threats posed by advancements in enemy employment tactics and commercially available technology.</p> <p><b>FY 2023 Plans:</b></p> <ul style="list-style-type: none"> <li>- Update Medusa C2 software to further interoperability and incorporation within the ABMS architecture</li> <li>- Continue electronic warfare upgrades, to include but not limited to, new sensor and effector components, and improve Ninja to leverage full Ninja capability within Medusa C2</li> <li>- Continue efforts in alignment with the DoD's Joint C-sUAS Office</li> <li>- Evaluate new capabilities and add capabilities to the capability storefront to enable streamlined acquisition of capabilities for bases</li> <li>- Develop and test, via bi-weekly software sprints, an annual software upgrade for 19 fixed sites</li> <li>- Cyber harden all new system changes</li> <li>- Support management of JCO funded Ninja development</li> </ul> <p><b>FY 2024 Plans:</b></p> <ul style="list-style-type: none"> <li>- Will continue to update Medusa C2 software to further interoperability and incorporation within the ABMS architecture</li> <li>- Will continue to evaluate and add capabilities to enable streamlined acquisition</li> <li>- Will continue electronic warfare upgrades, to include but not limited to new sensor and effector components, and new Ninja skills which leverage full Ninja capability within Medusa C2</li> <li>- Will continue efforts in alignment with the DoD's JCO</li> </ul> <p><b>FY 2023 to FY 2024 Increase/Decrease Statement:</b> Funding increased due to inflation costs</p>				
<p><b>Title:</b> ABADS(MD)</p> <p><b>Description:</b> The initial phase of this effort will leverage AF and Joint C2 capabilities to develop a prototype ABADS(MD) capability optimized for AF defense of airbases and other critical infrastructure. The AF will integrate the prototype BMC2 system with existing sensors and a classified non-kinetic defense capability.</p> <p><b>FY 2023 Plans:</b></p> <ul style="list-style-type: none"> <li>- Will define ABADS(MD) system requirements</li> <li>- Will initiate prototype efforts for ABADS(MD)</li> <li>- Will develop tailored ABADS(MD) BMC2 software application</li> <li>- Will identify and assess candidate Integrated Fire Control Center architecture solutions</li> </ul>		0.000	42.135	73.276

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<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>	FY 2022	FY 2023	FY 2024
<p>- Will identify and assess candidate platform/infrastructure agnostic ABADS(MD) BMC2 Software</p> <p><b>FY 2024 Plans:</b></p> <ul style="list-style-type: none"> <li>- Will continue software development utilizing an agile Development, Security, and Operations (DevSecOps) approach</li> <li>- Will integrate all software, including joint integrated fire control solution, track manager, tactical radios, ABMS network compatibility and other requirements as specified in the Rapid Prototyping Requirements Document (RPRD)</li> <li>- Will demonstrate joint service integration with JTMC and JTIFC capability in ABADS(MD)</li> <li>- Will demonstrate an interface into an agreed upon ABMS architecture and C-sUAS/C-RAM C2 networks</li> <li>- Will demonstrate compatibility with Tactical Operations Center (TOC) family of systems</li> <li>- Will demonstrate cost-effective integrated fire control solution for PACAF AOR</li> </ul> <p><b>FY 2023 to FY 2024 Increase/Decrease Statement:</b>                      ABADS(MD) funding increased from FY23 to FY24 in order to support the rapid ramp-up of program prototyping efforts in line with program goals and schedule. The funding supports design, software development, system integration and testing activities for multiple vendors as they work to competitively deliver a solution for Air Force evaluation and selection.</p>			
<b>Accomplishments/Planned Programs Subtotals</b>	10.526	47.465	78.867

<b>D. Other Program Funding Summary (\$ in Millions)</b>											
<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• OPAF 03 0207522F: <i>Airbase Air Defense Systems (ABADS) for Missile Defense</i>	-	-	-	-	-	64.451	83.297	128.817	190.097	Continuing	Continuing
• OPAF 03 0207522F.: <i>Airbase Air Defense Systems (ABADS) for C-sUAS</i>	42.168	23.911	5.029	-	5.029	9.529	12.052	12.289	12.535	Continuing	Continuing

**Remarks**

**E. Acquisition Strategy**  
 ABADS(MD) is a Middle Tier of Acquisition, Rapid Prototyping, and follow-on Rapid Fielding effort. This strategy aims to develop -- production-ready -- airbase defense systems with a modern software architecture, processes, and support tools which enable the integration of cooperative defense systems. Example integration services include, but are not limited to, establishing CI/CD software pipelines, implementing Agile DevSecOps processes, and deploying model-based design. The AF plans to leverage existing ID/IQ contracts and parallel joint efforts to deliver system prototypes that meet warfighter requirements. The intent is to achieve validation of these

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systems via a series of tests and demonstrations in operationally relevant environments. The Milestone Decision Authority (MDA) for this effort is the Program Executive Officer (PEO) for the Command, Control, Communications and Battle Management (C3BM) portfolio.

C-sUAS implements a "Government-as-the-Integrator" approach by procuring engineering and integration services to supplement Government resources, in an effort to keep pace with the adversary threat environment. For FY24, the primary efforts endeavor to improve cybersecurity posture, and resolve system gaps. Example integration services also include, but are not limited to, establishing a continuous integration/continuous deployment (CI/CD) software pipeline, implementing Agile DevSecOps processes and deploying model-based design. As possible, the Government will leverage small business innovative research opportunities to generate new code to produce capabilities for detection and defeat of airborne threats. The MDA for this effort is the PEO for the Digital Systems portfolio.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Air Force** **Date:** March 2023

<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0207522F / Airbase Air Defense System (ABADS)	<b>Project (Number/Name)</b> 640410 / Tech Maturation & Risk Reduct s
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<b>Product Development (\$ in Millions)</b>				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
ABADS(C-sUAS) - Joint Serv System Development	Various	Not specified. : TBD	-	1.704	Jul 2022	1.552	Nov 2022	1.231	Nov 2023	-		1.231	Continuing	Continuing	-
ABADS(C-sUAS) - New Platform Development	Various	Not specified. : TBD	-	0.500	Jan 2022	1.376	May 2023	0.760	May 2024	-		0.760	Continuing	Continuing	-
ABADS(C-sUAS) - Software Development	Various	Not specified. : TBD	-	3.200	Jul 2022	1.852	May 2023	1.550	May 2024	-		1.550	Continuing	Continuing	-
ABADS(MD) - Prototype Development (Hardware / Software)	C/CPFF	2.1 - Proto / 2.2 s/w : WPAFB, OH	-	-		24.435	May 2023	56.191	May 2024	-		56.191	Continuing	Continuing	-
ABADS(MD) - BMC2 Risk Reduction	MIPR	2.1 - Prototyping : TBD	-	-		1.820	Mar 2023	-		-		-	Continuing	Continuing	-
ABADS(MD) - Non-Kinetic Effector Development	C/CPFF	2.1 - Prototyping : WPAFB, OH	-	-		6.000	Mar 2023	-		-		-	Continuing	Continuing	-
ABADS(MD) - Sensor Laydown Study	TBD	2.1 - Prototyping : TBD	-	-		4.000	Mar 2023	-		-		-	Continuing	Continuing	-
<b>Subtotal</b>			-	5.404		41.035		59.732		-		59.732	Continuing	Continuing	N/A

<b>Support (\$ in Millions)</b>				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
Direct Cite Authority	Various	Not specified. : TBD	-	0.251	Apr 2022	-		-		-		-	Continuing	Continuing	-
<b>Subtotal</b>			-	0.251		-		-		-		-	Continuing	Continuing	N/A

<b>Test and Evaluation (\$ in Millions)</b>				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
ABADS(C-sUAS) - Test	Various	Not specified. : TBD	-	1.100	Jun 2022	-		-		-		-	Continuing	Continuing	-
ABADS(MD) - Test	Various	2.3 - System Testing : TBD	-	-		2.000	Jun 2023	7.855	Nov 2023	-		7.855	Continuing	Continuing	18.380

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<b>Test and Evaluation (\$ in Millions)</b>				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
ABADS(MD) - Demonstration	Various	2.3 - System Testing : TBD	-	-		1.000	Jun 2023	6.000	Jun 2024	-		6.000	Continuing	Continuing	-
<b>Subtotal</b>			-	1.100		3.000		13.855		-		13.855	Continuing	Continuing	N/A

<b>Management Services (\$ in Millions)</b>				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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			
ABADS(C-sUAS) - Systems Engineer	C/Various	Various : Hanscom, MA	-	3.571	Jul 2022	-		1.250	Dec 2023	-		1.250	Continuing	Continuing	-
ABADS(C-sUAS) - Management Services	C/Various	Various : Hanscom, MA	-	0.200	Jul 2022	0.550	Feb 2023	0.800	Feb 2024	-		0.800	Continuing	Continuing	-
ABADS(MD) - A&AS Support	C/Various	Various (2.1, 2.2, 2.3) : WPAFB, OH	-	-		2.380	Mar 2023	2.730	Mar 2024	-		2.730	Continuing	Continuing	24.954
ABADS(MD) - Travel	Various	Various (2.1, 2.2, 2.3) : TBD	-	-		0.500		0.500		-		0.500	Continuing	Continuing	-
<b>Subtotal</b>			-	3.771		3.430		5.280		-		5.280	Continuing	Continuing	N/A

	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract	
<b>Project Cost Totals</b>		-	10.526	47.465	78.867	-	78.867	Continuing	Continuing	N/A

**Remarks**

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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2024 Air Force		<b>Date:</b> March 2023
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FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
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

<b>ABADS(C-sUAS) - Events</b>	
1.1 - ABADS(C-sUAS) - Joint Service Lead System Development	
1.2 - ABADS(C-sUAS) - Software Development	
1.3 - ABADS(C-sUAS) - Test	
1.4 - ABADS(C-sUAS) - New Platform Development	
1.5 - ABADS(C-sUAS) - Systems Engineering	
<b>ABADS(MD) - Events</b>	
2.1 - ABADS(MD) - Prototype Development	
2.2 - ABADS(MD) - BMC2 Development (Software)	
2.3 - ABADS(MD) - Prototype Testing	
2.4 - ABADS(MD) - Operational Software Continuous Integration/Test/Delivery	
2.5 - ABADS(MD) - Operations and Sustainment	

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2024 Air Force		<b>Date:</b> March 2023
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>ABADS(C-sUAS) - Events</b>				
1.1 - ABADS(C-sUAS) - Joint Service Lead System Development	2	2022	4	2028
1.2 - ABADS(C-sUAS) - Software Development	3	2022	4	2028
1.3 - ABADS(C-sUAS) - Test	3	2022	4	2028
1.4 - ABADS(C-sUAS) - New Platform Development	2	2022	4	2028
1.5 - ABADS(C-sUAS) - Systems Engineering	2	2022	4	2028
<b>ABADS(MD) - Events</b>				
2.1 - ABADS(MD) - Prototype Development	3	2023	1	2025
2.2 - ABADS(MD) - BMC2 Development (Software)	3	2023	1	2025
2.3 - ABADS(MD) - Prototype Testing	3	2024	4	2025
2.4 - ABADS(MD) - Operational Software Continuous Integration/Test/Delivery	4	2025	4	2028
2.5 - ABADS(MD) - Operations and Sustainment	4	2025	4	2028