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Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Air Force **Date:** May 2021

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 8: Software and Digital Technology Pilot Programs</i>	R-1 Program Element (Number/Name) PE 0608410F / <i>Air & Space Operations Center (AOC) - Software Pilot Program</i>
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COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	186.915	0.000	186.915	-	-	-	-	-	-
684596: <i>AOC - Software Pilot Program</i>	-	0.000	0.000	186.915	0.000	186.915	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2022, PE 0608410F, Air & Space Operations Center (AOC), Project 684596, AOC WS Modifications, was transferred from RDT&E, AF, PE 0207410F, Air & Space Operations Center (AOC), Project 674596, AOC WS Modifications, OPAF PE 0207410F, Air & Space Operations Center (AOC), Line Item 834530, AOC, and OMAF Operating Forces, Activity Group, Air Operations, Sub-Activity Group 11C, Combat Enhances Forces, in order to a participate in DoD's Budget Activity 08 (BA08) for Software and Digital Technology Pilot Program.

A. Mission Description and Budget Item Justification

This effort is not a new start. The FY 2018 NDAA Sections 873/874 directed OSD to streamline software development. The Air Operations Center Weapon System (AOC WS) is an OUSD(A&S) pilot initiative in which all lifecycle funding will be tracked under BA08, Software and Digital Technology Pilot Programs. Pilot programs will test the ability to execute modern software development practices encompassing development, procurement, modification and sustainment activities.

The AOC WS, AN/USQ-163 Falconer, the senior element of the Theater Air Control System (TACS), is the weapon system that the Commander, Air Force Forces (COMAFFOR) provides the Combined/Joint Force Air Component Commander (C/JFACC) for planning, executing, and assessing theater-wide air and space operations. The C/JFACC provides air, space and cyber support to the Combined/Joint Forces Commander (C/JFC) by coordinating, deconflicting, and assessing the progress of various weapon systems to advance the C/JFC's campaign. The AOC WS develops operations strategy and planning documents. The weapon system also disseminates tasking orders; executes day-to-day peacetime and combat air, space and cyber operations; and provides rapid reaction to immediate situations by exercising positive control of friendly forces. This program is part of the overarching Kessel Run portfolio.

In FY 2022, funding supports continued software engineering capacity required for AOC WS Modifications to enable the transition from legacy systems (e.g., Theater Battle Management Core System - Force Level (TBMCS FL) and AOC 10.1) to Block 20 modernized applications while delivering, enabling and operating an extensible cloud-based Infrastructure and Platform as a Service (IaaS/PaaS) hosting platform. AOC WS Modifications are required for the AOC to keep pace with evolving COTS/GOTS components, DoD directives, support operational energy security and efficiency objectives, changes in the underlying IT environment, and to remain interoperable, certified, supportable, and compliant through software engineering solutions, integration, testing, fielding, training, and sustainment of new capabilities and upgrades to the AOC WS. Also in FY 2022, AOC WS Modifications activities evolve the AOC utilizing Agile Methodologies and embracing DevOps practices to deliver improved capabilities in support of mission requirements at Geographic and Global (formerly Functional) AOCs, as well as Support and Manpower Augmentation units, keeping the AOC current and interoperable with the Combatant Commands (CCMDs), cyber requirements, and next generation weapon systems/weapons.

The FY 2022 funding request was reduced by \$3.774 million to account for the availability of prior year execution balances in PE 0207410F.

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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 0605831F. In FY20 \$0.000M was expended for civilian pay expenses in this program element, and in FY21 \$0.000M is forecasted for civilian pay expenses in this program element.

This program is in Budget Activity 8, Software and Digital Technology Pilot Program because this budget activity includes funding provided for expenses necessary for agile development, test and evaluation, procurement, production and modification, and the operation and maintenance of these programs.

B. Program Change Summary (\$ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	186.915	0.000	186.915
Total Adjustments	0.000	0.000	186.915	0.000	186.915
• 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	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	186.915	0.000	186.915

Change Summary Explanation

FY 2022: Funding increased due to transfer of RDT&E, AF and OPAF from PE 0207410F, Air & Space Operations Center (AOC), and OMAF from Sub-Activity Group 11C, Combat Enhancement Forces.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: AOC WS Modifications - Development	0.000	0.000	90.027	0.000	90.027
Description: Plan and execute strategies to deliver war fighting outcomes by leveraging commercial best practices for agile software development, scale a modern IaaS/PaaS solution to the AOC WS enterprise, implement improved solutions for platform architecture and Continuous Integration/Continuous Delivery (CI/CD) pipeline, enable objectives that support operational energy and security efficiencies and maintain continuous Authority to Operate (ATO). Conduct software engineering solutions by leveraging agile engineering methodologies to engineer, integrate, and test modifications to the AOC WS leveraging test-driven development.					

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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
<p>Utilize CI/CD processes to provide engineering solutions, test, and deliver enhanced operational C2 capabilities including support of multi-domain operations.</p> <p>FY 2021 Plans: See PE 0207410F, Air & Space Operations Center (AOC), Project Number 674596, AOC WS Modifications.</p> <p>FY 2022 Base Plans:</p> <ul style="list-style-type: none"> - Enable the continued transition from legacy applications such as TBMCS FL and AOC 10.1 to Block 20 Modernized applications - Continue supporting software engineering capacity required for AOC WS Modifications to enable transition from legacy AOC 10.1 baseline to AOC WS Block 20 modernized capabilities - Continue to optimize Operational Energy (aviation fuel) use and increase combat capability through operations software development <p>FY 2022 OCO Plans: N/A</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Funding increased due to continuation of software development to modernize warfighter mission thread capabilities and return program to original development team capacity levels in order to retire legacy AOC mission applications, AOC 10.1 and TBMCS-FL.</p>					
<p>Title: AOC WS Modifications - Procurement</p> <p>Description: Provides hardware, software, technical documents, fielding support, Capital Equipment Replacement (CER) (e.g., replacing end of life/end of support Direct Mission Support (DMS) and 3rd Party components), core radio system and initial training to standardize the AOC WS to keep it interoperable, supportable and compliant (e.g., certification and accreditation). Also includes integration, test and fielding for cyber security improvements and existing 3rd Party modernized improvements/modifications.</p> <p>FY 2021 Plans: See PE 0207410F, Air & Space Operations Center (AOC), Line Item 834530, AOC.</p> <p>FY 2022 Base Plans:</p> <ul style="list-style-type: none"> - Integration/fielding of improvements/upgrades of existing 3rd Party applications as well as newly developed replacement applications, CER and baseline updates. Address commercial end-of-life and DMS components including components associated with C2 applications (3rd Party COTS/GOTS) 	0.000	0.000	20.795	0.000	20.795

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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
- Support moving the AOC WS toward a cloud-based commercially managed Infrastructure and Platform as a Service (IaaS/ PaaS) - Provide Baseline Releases, periodic maintenance upgrades, emergency fixes, cyber security improvements and other activities (e.g., testing activities) FY 2022 OCO Plans: N/A FY 2021 to FY 2022 Increase/Decrease Statement: Funding increased due to support costs of moving the AOC WS toward a cloud-based commercially managed Infrastructure and Platform as a Service (IaaS/ PaaS).					
Title: AOC WS Modifications - Sustainment Description: Operations and Maintenance efforts sustain the fielded AOC WS and provide the foundation to transition to AOC WS Block 20. Provides critical integration and sustainment support to legacy 3rd party systems, infrastructure support, on-premise technical support and assistance, addresses cybersecurity requirements, hardware/software license renewals, release engineering services, help desk activities, testing operational, performance, functional and security requirements, quality assurance, configuration management, and documentation support. FY 2021 Plans: See OMAF Operating Forces, Activity Group, Air Operations, Sub-Activity Group 11C, Combat Enhances Forces. FY 2022 Base Plans: - Continue sustainment and integration activities to the current AOC WS baseline and support Block 20 Operational C2 presentation of capability as it is delivered FY 2022 OCO Plans: N/A FY 2021 to FY 2022 Increase/Decrease Statement: Funding increased due to inclusion of operations and maintenance activities into pilot effort and continued sustainment and integration activities to the current AOC WS baseline and to support Block 20 Operational C2 presentation of delivered capabilities.	0.000	0.000	76.093	0.000	76.093
Accomplishments/Planned Programs Subtotals	0.000	0.000	186.915	0.000	186.915

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D. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u> <u>Base</u>	<u>FY 2022</u> <u>OCO</u>	<u>FY 2022</u> <u>Total</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• OPAF 03 834530: <i>Air & Space Operations Center (AOC)</i>	33.243	15.383	2.224	0.000	2.224	-	-	-	-	-	-

Remarks

E. Acquisition Strategy

The acquisition strategy builds on agile software engineering solutions and modification of existing capabilities using evolutionary acquisition to standardize and modify the AOC WS. The initial capability was AOC WS Increment 10.0, which fielded the 10.0 configuration to five operational sites, plus a Help Desk and a Formal Training Unit. The second increment, Increment 10.1, upgraded these locations to an integrated baseline and fielded the baseline to additional operational and reserve units worldwide. AOC WS Modifications will leverage commercial best practices of Agile DevOps to scale out a modern virtual private cloud to the AOCs and scale up additional software product teams in support of retiring TBMCS FL and other legacy mission critical applications allowing for eventual disposal of the AOC 10.1 infrastructure. This enables dynamic resource allocation based on current warfighter needs. AOC Modifications operates under authority of FY16 NDAA, Section 804, Middle Tier of Acquisition for Rapid Prototyping and Rapid Fielding, leveraging commercial best practices to reduce timelines by modularizing both the development work and the associated contracting and funding strategies. The program is transitioning to a Software Acquisition Pathway following DoDI 5000.87, Operation of Software Acquisition Pathway Guidance. The desired end state is continuous delivery of all AOC WS software.

AOC WS Modifications will leverage the AOC WS Long-Term Modification and Sustainment (LTM&S) contract which will provide support to government led integration of the AOC WS enterprise. AOC WS Modifications will also use Other Transaction Authority (OTA) to adopt commercial best practices for software development and to scale out a modern Infrastructure as a Service/Platform as a Service (IaaS/PaaS) solution. Activities are also accomplished via Military Interdepartmental Purchase Requests (MIPR). Additionally, significant technical expertise will be sought after via modular contracting approach and provided by Government Agencies, DoD Laboratory, Federally Funded Research and Development Centers (FFRDC), Academia, and Engineering & Professional Acquisition Support Services contractors as well as commercial industry partners.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Air Force												Date: May 2021			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
3600 / 8				PE 0608410F / Air & Space Operations Center (AOC) - Software Pilot Program				684596 / AOC - Software Pilot Program							
Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
AOC WS Modifications Development	C/Various	Various : Multiple	-	0.000		0.000		75.071	Dec 2021	0.000		75.071	-	-	-
AOC WS Modifications Materials	C/Various	Various : Mutiple	-	0.000		0.000		19.185	Dec 2021	0.000		19.185	-	-	-
AOC WS Modifications Sustainment	C/Various	Various : Multiple	-	0.000		0.000		43.206	Dec 2021	0.000		43.206	-	-	-
AOC WS Modifications Other Transaction	Various	Pivotal : Multiple	-	0.000		0.000		1.089	Dec 2021	0.000		1.089	-	-	-
Subtotal			-	0.000		0.000		138.551		0.000		138.551	-	-	N/A
Support (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
AOC WS Modifications Direct Mission Support	C/TBD	Various : Various	-	0.000		0.000		18.321	Dec 2021	0.000		18.321	-	-	-
Subtotal			-	0.000		0.000		18.321		0.000		18.321	-	-	N/A
Management Services (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
AOC WS Modifications Engineering Services	Various	Various : Various	-	0.000		0.000		3.703	Oct 2021	0.000		3.703	-	-	-
AOC WS Modifications Program Support	C/Various	Various : Various	-	0.000		0.000		26.340	Dec 2021	-		26.340	-	-	-
Subtotal			-	0.000		0.000		30.043		0.000		30.043	-	-	N/A
Project Cost Totals			-	0.000		0.000		186.915		0.000		186.915	-	-	N/A

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	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract	

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 8	R-1 Program Element (Number/Name) PE 0608410F / Air & Space Operations Center (AOC) - Software Pilot Program	Project (Number/Name) 684596 / AOC - Software Pilot Program

FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
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

AOC WS Modifications	
AOC WS Modifications Kessel Run	██████████

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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 8	R-1 Program Element (Number/Name) PE 0608410F / Air & Space Operations Center (AOC) - Software Pilot Program	Project (Number/Name) 684596 / AOC - Software Pilot Program

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
AOC WS Modifications				
AOC WS Modifications Kessel Run	1	2022	4	2022

Note
See PE 0207410F, Air & Space Operations Center (AOC), Project Number 674596, AOC WS Modifications for prior years development events.