Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0102417F / *Over-the-Horizon Backscatter Radar*							
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	-	0.000	67.400	12.210	0.000	12.210	5.100	0.000	0.000	0.000	0.000	84.710
674865: *TACMOR Development*	-	0.000	67.400	12.210	0.000	12.210	5.100	0.000	0.000	0.000	0.000	84.710
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 7, PE 0102417F, project 674865, Homeland Defense OTHR Development, is a new start.

A. Mission Description and Budget Item Justification

Efforts funded in this Program Element include the Tactical Multi-Mission Over the Horizon Radar (TACMOR) is a compact Over the Horizon Radar (OTHR) in the Republic of Palau to provide enhanced Air Domain Awareness in the USINDOPACOM area of responsibility. TACMOR will be operated by the United States and located in the Republic of Palau, with the agreement of the government of Palau. Development, test and evaluation, and acquisition of the system and associated components will provide warfighters with the capability to close gaps in surveillance coverage in key regions of the Pacific area of interest to the United States and our Allies. TACMOR transitions to a production ready system after the successful completion of a Military Utility Assessment (MUA) and system-level Production Readiness Review (PRR).

Additional OTHR efforts targeted at Homeland Defense (HLD) funded in FY22; will develop modeling and simulation capability to validate performance required at up to 4 sites in CONUS.

TACMOR efforts funded in this Program Element include but are not limited to:

A remote, unattended Transmit site consisting of ten elements and high power amplifiers transmitting High Frequency (HF) Skywave Over-The-Horizon Radar (OTHR) waveforms. The transmit site will also consists of a HF vertical sounder antenna and a HF backscatter sounder providing ionogram information for optimizing frequency selection.
A remote, unattended Receive site consisting of 128 dual-monopole antenna elements receiving the over-the-horizon reflected energy from the transmit site. The receive site also contains the secure facilities for signal processing of the received data and real-time target extraction information.
This effort will also fund the communications infrastructure necessary to enable the data flow from the Transmit and Receive sites to an off-site operations control center. The operations control center plans and executes missions in support of the Combatant Command (CCMD) and provides real-time, target tracking information to all-source information fusion and dissemination systems. TACMOR data will also be accessible to and exploited by the National Air and Space Intelligence Center (NASIC) for detailed, post-event analysis.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605827F, 0605828F, 0605829F, 0605831F, 0605832F, 0605833F, 0605898F,

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0606398F. In PY22 0.0M was expended for civilian pay expenses in this program element, and in CY23 0.0M is forecasted for civilian pay expenses in this program element.e

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.000	42.300	0.000	0.000	0.000
Current President's Budget	0.000	67.400	12.210	0.000	12.210
Total Adjustments	0.000	25.100	12.210	0.000	12.210
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	25.100			
• 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	12.210	0.000	12.210

Change Summary Explanation

FY22: Congressional funding added targeted at Homeland Defense (HLD) OTHR.

FY23: 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.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Homeland Defense OTHR Development	-	25.100	0.000
Description: HLD OTHR efforts will focus on development of modeling and simulation aimed at conducting analysis for up to 4 CONUS sites. Modeling will provide key performance metrics unique to each site interaction with High Frequency Radar and the Ionosphere that will be used to finalize requirements and technical specifications to inform system acquisition. ***FY 2022 Plans:*** - Focus efforts on analysis of unique characteristics of the proposed 4 sites in CONUS to site configuration required to optimize system performance			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
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C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
-- Will continue establishment of modeling and simulation capability to assist in the verification and validation of metrics to establish baseline transmitter and receive array performance specifications -- Will begin drafting initial Key Performance Parameters, Key System Attributes and initiate engagement with industry to understand options for remote operations, automation, along with logistics and sustainment planning -- Build options for a sustainable software development environment to encourage rapid prototyping and technology insertion ***FY 2023 Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Initiated efforts to establish research, development and analysis of HLD OTHR			
Title: TACMOR Development ***Description:*** Will establish initial TACMOR prototype transition and development activities necessary to accept post production readiness system components and sub-components. ***FY 2022 Plans:*** - Developing and implementing full-scale production and factory acceptance test (FAT) capabilities for major sub-system components such as digital receivers and receiver optical control (ROC) units - Procuring long-lead items for full-scale production such as secure containers, transmit and receive elements, high-density multilayered printed circuit boards (PCBs), high power amplifiers, servers, and network switches - Began the assembly of major subsystem components such as the digital receivers, ROCs, transmit optical control (TOC) units, and direct digital drive chain - Performing assembly and integration of the major subsystems: receive subsystem, transmit subsystem, operations control center subsystems that include integration of the major subsystems within their appropriate containers and establishment of network connections necessary to enable Factory Acceptance Testing (FAT). - Executing test plans, procedures, and completing development of FAT-unique test equipment necessary to collect data at multiple points within the TACMOR system to confirm subsystem components meet performance specifications	0.000	42.300	12.210

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
- Executing FAT according to test plan, collect and analyze test data, and report on subsystem and component level successes and failures based on specifications and overall TACMOR system requirements flow down - Developing and installing communication infrastructure in support of offsite data transmission and dissemination. This includes associated authority to operate and cyber hardening ***FY 2023 Plans:*** - Will continue assembly and integration activities for the major subsystems: receive subsystem, transmit subsystem, operations control center subsystems that include integration of the major subsystems within their appropriate containers and establishment of network connections necessary to enable Factory Acceptance Testing (FAT). - Will execute test plans, procedures, and procure FAT-unique test equipment necessary to collect data at multiple points within the TACMOR system to confirm subsystem components meet performance specifications - Will continue to execute FAT according to test plans, collect and analyze test data, and report on subsystem and component level successes and failures based on specifications and overall TACMOR system requirements flow down - Will complete development of a System Integration Lab (SIL) capability to allow for early test and integration of TACMOR unique hardware and software to run in a maintenance environment. Allows for initial training of TACMOR maintainers to gain familiarity with the major systems and subsystem components. - Will integrate the Wideband Communications Architecture in the SIL environment to test, evaluate and verify the Primary, Alternate, Contingency, and Emergency communications architecture prior to fielding - Will continue development and installation of communication infrastructure in support of offsite data transmission and dissemination. This includes associated authority to operate and cyber hardening - Will begin development of initial operations training material in support of Initial Operational Test and Evaluation (IOT&E) process - Will complete development of support documentation; i.e.; Technical Orders, Site Diagrams, and finalize requirements for specific contractor deliverables in support of IOT&E ***FY 2022 to FY 2023 Increase/Decrease Statement:***			

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
The second year of development activity involves lower costs non-recurring engineering and software integration in a lab environment along with associated testing activities			
Accomplishments/Planned Programs Subtotals	0.000	67.400	12.210

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

TACMOR will be executed out of the PEO Digital portfolio and Air Force Life Cycle Management Center Command and Control, Intelligence, Surveillance and Reconnaissance Division. For contracting efforts, a Single Award IDIQ contract with multiple task orders will be competitively awarded.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Integration Lab development and Communications Architecture Development	C/FFP	AFLCMC/HBG : Robins, AFB, GA	-	-		-		9.610	Feb 2023	-		9.610	Continuing	Continuing	-
Long Lead Items; Prototype Production Readiness Review and Component Integration activities	C/FFP	AFLCMC/HBG : Robins, AFB, GA	-	-		39.960	Aug 2022	-		-		-	Continuing	Continuing	-
Homeland Defense OTHR Modeling and Simulation, Site Analysis, Requirements and Performance Metrics Development	Various	AFLCMC/HBG : Robins, AFB, GA	-	-		23.040	Aug 2022	-		-		-	Continuing	Continuing	-
		Subtotal	-	-		63.000		9.610		-		9.610	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	MIPR	DIA & HAF/A2 : Patrick/SFB, FL	-	-		1.000	Mar 2022	1.000	Nov 2022	-		1.000	Continuing	Continuing	-
		Subtotal	-	-		1.000		1.000		-		1.000	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integration Validation and Verification	Various	AFLCMC/HBG : Robins, AFB, GA	-	-		1.100	Mar 2022	0.300	Dec 2022	-		0.300	Continuing	Continuing	-
		Subtotal	-	-		1.100		0.300		-		0.300	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering and Program Office Management	Various	AFLCMC/HBG : Robins, AFB, GA	-	-		2.300	Nov 2021	1.300	Nov 2022	-		1.300	Continuing	Continuing	-
		Subtotal	-	-		2.300		1.300		-		1.300	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		67.400		12.210		-		12.210	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
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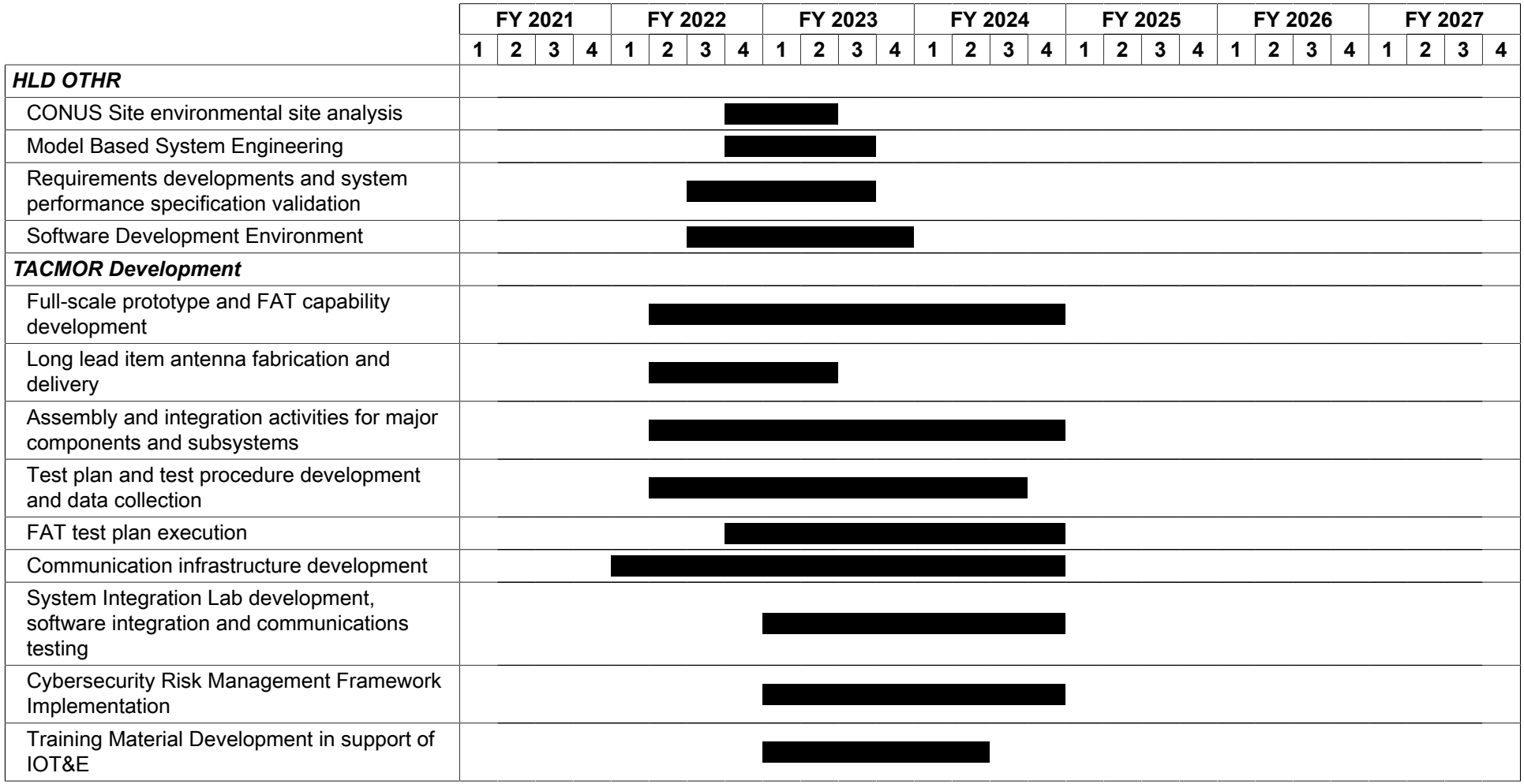

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
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Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
HLD OTHR				
CONUS Site environmental site analysis	4	2022	2	2023
Model Based System Engineering	4	2022	3	2023
Requirements developments and system performance specification validation	3	2022	3	2023
Software Development Environment	3	2022	4	2023
TACMOR Development				
Full-scale prototype and FAT capability development	2	2022	4	2024
Long lead item antenna fabrication and delivery	2	2022	2	2023
Assembly and integration activities for major components and subsystems	2	2022	4	2024
Test plan and test procedure development and data collection	2	2022	3	2024
FAT test plan execution	4	2022	4	2024
Communication infrastructure development	1	2022	4	2024
System Integration Lab development, software integration and communications testing	1	2023	4	2024
Cybersecurity Risk Management Framework Implementation	1	2023	4	2024
Training Material Development in support of IOT&E	1	2023	2	2024