Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
Appropriation/Budget Activity 3620F: *Research, Development, Test & Evaluation, Space Force I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203873SF *I Ballistic Missile Defense Radars*

COST ($ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	23.194	20.752	12.024	0.000	12.024	0.000	0.000	0.000	0.000	0.000	55.970
674820: *Sensor Development*	-	23.194	20.752	12.024	0.000	12.024	0.000	0.000	0.000	0.000	0.000	55.970
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

COBRA DANE (CD) radar is located 200 miles from Russia, at Eareckson AS, AK (Shemya Island, AK). CD is the most powerful, sensitive, and accurate Ground-based Midcourse Defense (GMD) radar and the premier Ballistic Missile Defense (BMD) radar. At the same time, it is the most accurate and capable phased array available to the Space Surveillance Network (SSN) for cataloging hazardous and difficult-to-track satellites and space debris objects that clutter the near-earth orbital regime that cannot be detected by most other SSN tracking assets. CD detects Intercontinental Ballistic Missiles (ICBMs) and Sea-Launched Ballistic Missiles (SLBMs), classifies reentry vehicles (RVs) and other missile objects, provides real-time information to the GMD Fire Control (GFC), and provides tracking of threat ballistic missiles with sufficient accuracy to commit the launch of interceptors and to update the target tracks to the interceptor while the interceptor is in flight. CD's other primary mission is to support US Space Command (USSPACECOM)'s Space Domain Awareness (SDA) mission by detecting, tracking, correlating, and characterizing man-made resident space objects, primarily in the Low-Earth Orbit (LEO) regime, including space debris and early observation of New Foreign Launches (NFLs). It operates as part of the larger SSN and provides metric observation data to its command and control nodes: the Combined Space Operations Center (CSpOC) and the Distributed Space Command and Control - Dahlgren (DSC2-D). CD also supports USSPACECOM's Space Object Identification (SOI) mission by providing narrowband radar data of man-made resident space objects in the LEO regime. SOI information is used to ascertain the mission and operational status of various payloads and aids in forecasting maneuvers or deorbits.

CD will acquire a modern architecture through design, development, integration, and test. This architecture enhances mission capability, providing warfighter and stakeholder customers direct operational benefit. CD utilizes Federally Funded Research and Development Centers (FFRDC), Systems Engineering and Integration (SE&I), University Affiliated Research Center (UARC), and Assistance and Advisory Services (A&AS) contractors to support programmatic and technical activities. Activities include studies and analysis to support both current program planning and execution and future program planning. Specifically, the Automated Data Processing Equipment (ADPE) Rehost program upgrades the CD system's radar back-end mission data processing, radar management and control, and signal processing capabilities to a modern architecture that facilitates long-term mission resiliency, cyber security, system viability, high operational availability, and rapid hardware and software development and deployment capability. RDT&E funds were provided to the Missile Defense Agency (MDA) to accelerate the joint Department of the Air Force and MDA modernization program of the CD radar. In addition to funds being used to modernize this back end of the radar, these funds will also be used for out-year planning of front-end component modernization including enhancement of communication elements.

The PARCS Radar Digitization Upgrade Study will determine the requirement to modernize the radar through a systematic re-architecture from an analog infrastructure to a digital phased array radar to keep up with modern threats.

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This program element may include necessary civilian pay expenses required to manage, execute, and deliver Ballistic Missile Defense Radars weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 1206392SF and 1206398SF.

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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	21.615	20.752	9.065	0.000	9.065
Current President's Budget	23.194	20.752	12.024	0.000	12.024
Total Adjustments	1.579	0.000	2.959	0.000	2.959
• 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	2.160	0.000			
• SBIR/STTR Transfer	-0.581	0.000			
• Other	0.000	0.000	2.959	0.000	2.959

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2023	FY 2024
Project: 674820: *Sensor Development*		
Congressional Add: *PARCS Radar Digitization Upgrade Study*	3.000	-
Congressional Add Subtotals for Project: 674820	3.000	-
Congressional Add Totals for all Projects	3.000	-

Change Summary Explanation

FY 2023: 2.160M Below Threshold Reprogramming to fund ADPE Requirements.
FY 2025: 4.598M transfer from Space Force Procurement funding (SPCMOD) for BMD radars to Space Force RDT&E BMD radars for CD upgrades needed to meet evolving space threats.
FY 2025: -1.663M decrease for higher Space Force priorities.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Title: ADPE Rehost Upgrade, Phase II	20.194	20.752	12.024

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Description: The Automated Data Processing Equipment (ADPE) Rehost (ADPE-R) Phase II Signal Processor, Radar Controller and Receiver modernization. Mission Computer replacement will also be accomplished as soon as resources allow. The approach will modernize these systems with an innovative hardware and software-based open architecture solution supported by switching solutions and modernized development environments. ***FY 2024 Plans:*** Continue effort to upgrade the Signal Processor, Radar Controller, Receiver-Exciter (SPARC/REX) and Mission Computer. The programs will continue the development of software and hardware for the upgrade of the SPARC/REX and mission computer. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc. ***FY 2025 Plans:*** The FY 2025 PB restructures the ADPE-R program to continue development of the Signal Processor, Radar Controller, Receiver-Exciter (SPARC/REX) and support integration and testing for upgrading Mission Processing to address emerging threats, up to the point where it could be operationally accepted pending future decisions. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** FY 2025 decreased due to ADPE rehost upgrade development ending prior to conducting formal site Operational Acceptance.			
Accomplishments/Planned Programs Subtotals	20.194	20.752	12.024

	FY 2023	FY 2024
Congressional Add: PARCS Radar Digitization Upgrade Study	3.000	-
FY 2023 Accomplishments: The PARCS RADAR Digitization Study will determine the requirement to modernize the radar from an analog infrastructure to a digital phased array radar to keep up with modern threats. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc.		
Congressional Adds Subtotals	3.000	-

D. Other Program Funding Summary ($ in Millions)

N/A

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D. Other Program Funding Summary ($ in Millions)

Remarks

E. Acquisition Strategy

The ADPE Rehost acquisition strategy has transitioned to traditional acquisition delivery orders under a University Affiliated Research Center (UARC), sole-source, cost-plus fixed fee contract. This approach will provide a phased extension of system service life to ensure warfighter capability through at least 2030. This evolutionary migration to a modernized open system approach provides the foundation for adaptable system sustainment and addition of future capabilities.

PARCS Radar Digitization upgrade study will be accomplished using an existing indefinite delivery/indefinite quantity contract.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force			Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203873SF / *Ballistic Missile Defense Radars*	Project (Number/Name) 674820 / *Sensor Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ADPE Phase II, Mission Computer Replacement	SS/CPAF	Various : Colorado Springs, CO	-	7.742	Feb 2023	7.713	Oct 2023	4.150	Oct 2024	-		4.150	Continuing	Continuing	-
Signal Processor, Radar Controller, Receiver-Exciter Replacement	SS/CPAF	Various : Colorado Springs, CO	-	8.918	Feb 2023	10.419	Oct 2023	5.544	Oct 2024	-		5.544	Continuing	Continuing	-
PARCS Radar Digitization	SS/CPFF	Georgia Tech : Atlanta, GA	-	3.000	Jul 2023	-		-		-		-	0.000	3.000	-
SBIR/STTR	TBD	TBD : TBD	-	0.581	Oct 2022	0.479	Oct 2023	0.500	Oct 2024	-		0.500	Continuing	Continuing	-
		Subtotal	-	20.241		18.611		10.194		-		10.194	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ADPE Integration	Various	Riverside Res Institute : Colorado Springs, CO	-	0.700	Dec 2022	0.250	Dec 2023	0.302	Dec 2024	-		0.302	Continuing	Continuing	-
		Subtotal	-	0.700		0.250		0.302		-		0.302	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	Various	Space Readiness Delta : Colorado Springs, CO	-	0.410	Mar 2023	0.327	Jan 2024	0.050	Jan 2025	-		0.050	Continuing	Continuing	-
		Subtotal	-	0.410		0.327		0.050		-		0.050	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force			Date: March 2024
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
A&AS	Various	Various : Colorado Springs, CO	-	0.800	Jun 2023	0.619	Jan 2024	0.478	Jan 2025	-		0.478	Continuing	Continuing	-
Other Support	Various	Various : Colorado Springs, CO	-	1.043	Jun 2023	0.945	Mar 2024	1.000	Mar 2025	-		1.000	Continuing	Continuing	-
		Subtotal	-	1.843		1.564		1.478		-		1.478	Continuing	Continuing	N/A

	Prior Years	FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	23.194		20.752		12.024		-		12.024	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	**R-1 Program Element (Number/Name)** PE 1203873SF / *Ballistic Missile Defense Radars*	**Project (Number/Name)** 674820 / *Sensor Development*

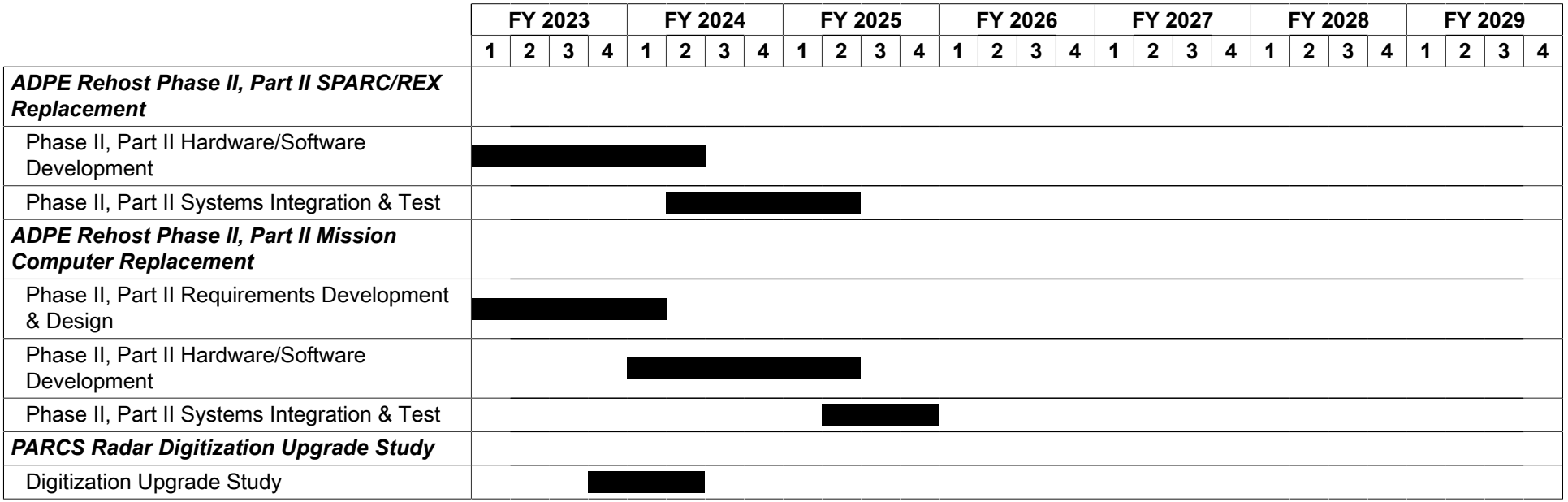

Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	**R-1 Program Element (Number/Name)** PE 1203873SF / *Ballistic Missile Defense Radars*	**Project (Number/Name)** 674820 / *Sensor Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ADPE Rehost Phase II, Part II SPARC/REX Replacement				
Phase II, Part II Hardware/Software Development	1	2023	2	2024
Phase II, Part II Systems Integration & Test	2	2024	2	2025
ADPE Rehost Phase II, Part II Mission Computer Replacement				
Phase II, Part II Requirements Development & Design	1	2023	1	2024
Phase II, Part II Hardware/Software Development	1	2024	2	2025
Phase II, Part II Systems Integration & Test	2	2025	4	2025
PARCS Radar Digitization Upgrade Study				
Digitization Upgrade Study	4	2023	2	2024