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

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 0604025F / <i>Rapid Defense Experimentation Reserve (RDER)</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	-	0.000	0.000	154.300	0.000	154.300	0.000	0.000	0.000	0.000	Continuing	Continuing
640858: <i>AFWERX Prime</i>	-	0.000	0.000	154.300	0.000	154.300	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Department of the Air Force's component of the Rapid Defense Experimentation Reserve (RDER) is executed within this program element (PE). To facilitate rapid modernization of the force, the Rapid Defense Experimentation Reserve (RDER) initiative was established in the Defense Planning Guidance for Fiscal Years 2023-2027, to encourage multi-component experimentation through a campaign of learning. Services, Agencies, and other participating organizations are to identify "best of breed" capabilities developed among the DoD prototyping programs, and execute approved projects through large-scale, cross-service experiments in order to refine and/or validate the Joint Warfighting Concept (JWC). Organizations nominate proposals to the Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)) that are multi-component — involving Joint Services, International partners and/or other government agencies and link to one or more of the four key supporting concepts ("functional battles") of the Joint Warfighting Concept: Joint Concept for Fires, Joint Concept for Command and Control, Joint Concept for Contested Logistics, and Joint Concept for Information Advantage.

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. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	154.300	0.000	154.300
Total Adjustments	0.000	0.000	154.300	0.000	154.300
• 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	154.300	0.000	154.300

Change Summary Explanation

FY 2024 increased from FY 2023, by \$154.300 million (based on funding in PE 0604858F, Tech Transition Program.
 FY 2024 moved from PE 0604858F, Tech Transition Program, Experimentation Project, 645350, per Congressional Direction.

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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Title: Rapid Defense Experimentation Reserve</p> <p>Description: The Department of Defense implement multiple RDER experimentation series through Service nominated projects with execution timelines ranging from one to two years. The USD (R&E) will review project progress, and recommend new focus areas at least annually with the goal of quickly incorporating the most promising innovative prototypes into experiments, and promptly terminating projects that fail to achieve expectations. To incentivize a disciplined approach to rapidly identify, incorporate, and execute projects largely through the Military Services, the Department will fund approved Service projects for the upcoming fiscal year out of the Department reserves. Funding decisions on additional funds in follow-on years for new projects, and funding decrements for project terminations will be incorporated in budgets annually based on emerging requirements and periodic assessments of project viability. Services will execute these funds under oversight of the OSD in a manner consistent with the experimentation scenario for which individual projects were selected. Service experimentation outcomes will be designed to validate required capabilities enabling the JWC by evaluating and integrating prototyped technologies in operationally relevant, multi-domain environments. Experimentation results will facilitate Joint Staff analysis in the evaluation of the Joint Warfighting Concept, assist the Joint Requirements Oversight Counsel in requirements determination, and inform the Deputy's Management Action Group to make budget decisions that effect changes throughout the Department.</p> <p>FY 2023 Plans: RDER efforts include the following efforts: VADR, TURUL, Global Thunder, and RDER Classified Effort # 2 (further details available on the appropriate forum). - VADR: will develop and flight demonstrate precision RF synchronization open-architecture prototypes for enhanced sensing and disruptive electromagnetic spectrum (EMS) capability. VADR expands on methods developed under the Retroactive Arrays for Coherent Transmission (ReACT) program (previously budgeted in PE 0603766E Network Centric Warfare Technology) to advance EMS dominance. Specific plans for FY 2023 include developing advanced hardware and waveforms to raise the technology readiness level (TRL) of this disruptive EMS capability. Design and purchase advanced hardware system; Mature methods for acquiring threat radar waveforms; Mature and analyze enhanced waveforms. - Turul: will deliver a minimum viable product software that will enable the warfighter to make requests and receive information from a variety of commercial space providers. These data products will be utilized to automatically generate information products that the warfighter can leverage in their find, fix, track, target, engage, and assess (F2T2EA) workflows. In FY 2023 TURUL will deliver graphical User Interface accessible unclassified via the cloud that the warfighter can utilize to task, collect, and view data products from commercial space sensors. - Global Thunder: will prototype, integrate and perform operational experimentation on advanced satellite</p>	-	0.000	154.300

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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>communications terminals for selected aircraft. The terminals will follow the Global Lightning design architecture with the capability to dynamically switch between communications spacecraft in low-Earth orbit (LEO, 500-km), medium-Earth orbit (MEO, 8,000 km), and geosynchronous orbit (GEO, 36,000 km), utilizing a multi-modem design that allows connectivity to both commercial and protected government satellites. Global Thunder FY 2023 efforts include receiver terminal prototyping and initial aircraft integration.</p> <p>Due to Congressionally mandated PE creation timing and database locking the FY 2023 funds for RDER were mistakenly placed into Tech Transition PE (0604858F) Prototyping BPAC (645351). This issue is known and will be addressed during tech adjust.</p> <p>FY 2024 Plans: RDER Efforts for 24-1:</p> <ul style="list-style-type: none"> - Extended Range Hybrid eVTOL: Leverages Agility Prime government / industry partnership developing hybrid eVTOL aircraft with increased range (500 mi). - Aerial Port of the Future APOF - Large Area Runway Repair Gone Expeditionary (LAARGE): Large crater runway repair using nanomaterials. - Rapid Infrastructure Deployment: Rapidly deployable "base" that leverages alternative energy sources, secure comms, and modular structures. - Amphibious Contested Logistics Solutions: C-130 modification to enable takeoff and landing from water and amphibious employment of SEAD/DEAD, comms/C2 and logistics - Software Programmable Agile RF Tactical Aerial Network (SPARTAN2): Enhance connectivity, agility, and robustness of localized comm networks with low-cost wideband electronically-steered antennae for SPARTAN Software Radio with air and ground configurations and new beacon discovery waveform. - Classified Projects (more information available in appropriate forums) <p>RDER Efforts for 24-2:</p> <ul style="list-style-type: none"> - Control Systems for Coordinated Operations (CoSyCo): Validated and rapidly field-able datalinks and C2 networks, along with CONOPS and TTPs, for coordinated Autonomous Collaborative Platform (ACP) operations. 10M or possibly - LTAMDS-V: Low cost (lower than 3DELRR or LTAMDS), smaller form factor sensor with extended range allowing longer distance engagements than fielded Sentinels. Leverages significant Raytheon investment designed to be smaller version of Army LTAMDS. - Joint Tactical Edge Network (JTEN): Persistent information sharing across dissimilar message formats and heterogeneous data links (both IP and non-IP). JTEN architecture modular, non-proprietary, and based on Open Mission Systems (OMS) and Universal Command and Control (UCI) standards 			

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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
- Low Cost Threat Emitter (LCTE): Tactical, multi-band, SDR-based threat emissions simulator (threat emitter) Portable, programmable, disposable, modular and 5G connected - (GLADIATR) Rapidly Deployable Hypervelocity Gun Weapon System: Cost curve flipping (100k per shot) counter cruise missile system (highly mobile, C-130 transportable) More tactical config, expanded magazine, upgraded gun and fire control; capable of addressing larger threat space than existing systems - Classified Projects (more information available in appropriate forums)			
<i>FY 2023 to FY 2024 Increase/Decrease Statement:</i>			
FY 2024 funding increased compared to FY 2023 by \$154.300 million (based on funding in Program Element 0604858F, Tech Transition Program) in support of Air Force RDER activities, and per Congressional Direction to break out into independent program element.			
Accomplishments/Planned Programs Subtotals	-	0.000	154.300

D. Other Program Funding Summary (\$ in Millions)											
<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 Complete</u>	<u>Total Cost</u>
• RDTE 04 0604858F: <i>Tech Transition Program</i>	-	64.000	-	-	-	-	-	-	-	-	Continuing Continuing

Remarks

E. Acquisition Strategy

Various

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

Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604025F / Rapid Defense Experimentation Reserve (RDER)	Project (Number/Name) 640858 / AFWERX Prime
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Product Development (\$ in Millions)				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			
RDER 24-1 Extended Range Hybrid eVTOL	Various	Various : TBD	-	-		-		20.000	Dec 2023	-		20.000	Continuing	Continuing	-
RDER 24-1 Rapid Infrastructure Deployment	Various	Various : TBD	-	-		-		6.300	Oct 2023	-		6.300	Continuing	Continuing	-
RDER 24-1 Amphibious Contested Logistics Solutions	Various	Various : TBD	-	-		-		20.000	Oct 2023	-		20.000	Continuing	Continuing	-
RDER 24-1 Software Programmable Agile RF Tactical Aerial Network (SPARTAN 2)	Various	Various : TBD	-	-		-		6.700	Dec 2023	-		6.700	Continuing	Continuing	-
RDER 24-1 Classified	Various	Various : TBD	-	-		-		25.000	Oct 2023	-		25.000	Continuing	Continuing	-
RDER 24- 1 Aerial-Port of the Future	Various	Various : TBD	-	-		-		1.500	Dec 2023	-		1.500	Continuing	Continuing	-
RDER 24 -2 LTAMDS V	Various	Various : TBD	-	-		-		17.000	Nov 2023	-		17.000	Continuing	Continuing	-
RDER 24-2 Joint Tactical Edge Network (JTEN)	Various	Various : TBD	-	-		-		13.000	Oct 2023	-		13.000	Continuing	Continuing	-
RDER 24-2 GLADIATR Rapidly Deployable Hypervelocity Gun Weapon System	Various	Various : TBD	-	-		-		20.000	Dec 2023	-		20.000	Continuing	Continuing	-
RDER 24-2 Low Cost Threat Emitter	Various	Various : TBD	-	-		-		4.800	Dec 2023	-		4.800	Continuing	Continuing	-
RDER 24-2 Classified	Various	Various : TBD	-	-		-		10.000	Oct 2023	-		10.000	Continuing	Continuing	-
RDER 24-2 Control Systems for Coordinated Operations (CoSyCo)	Various	Various : TBD	-	-		-		10.000	Dec 2023	-		10.000	Continuing	Continuing	-
Subtotal			-	-		-		154.300		-		154.300	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
Project Cost Totals	-	-	-	154.300	-	154.300	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Air Force							Date: March 2023			
Appropriation/Budget Activity 3600 / 4			R-1 Program Element (Number/Name) PE 0604025F / <i>Rapid Defense Experimentation Reserve (RDER)</i>			Project (Number/Name) 640858 / <i>AFWERX Prime</i>				
	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract	

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604025F / <i>Rapid Defense Experimentation Reserve (RDER)</i>	Project (Number/Name) 640858 / <i>AFWERX Prime</i>

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

<i>Rapid Defense Experimentation Reserve</i>	
RDER	████████████████████
Extended Range Hybrid eVTOL	████████████████████
Aerial Port of the Future	████████████████████
Large Area Runway Repair Gone Expeditionary	████████████████████
Rapid Infrastructure Deployment	████████████████████
Amphibious Contested Logistics Solutions	████████████████████
Software Programmable Agile RF Tactical Aerial Network	████████████████████
Classified	████████████████████
Control Systems for Coordinated Operations	████████████████████
LTAMDS V Low Cost	████████████████████
Joint Tactical Edge Network	████████████████████
Low Cost Threat Emitter	████████████████████

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604025F / <i>Rapid Defense Experimentation Reserve (RDER)</i>	Project (Number/Name) 640858 / <i>AFWERX Prime</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Rapid Defense Experimentation Reserve</i>				
RDER	1	2024	4	2024
Extended Range Hybrid eVTOL	1	2024	4	2024
Aerial Port of the Future	1	2024	4	2024
Large Area Runway Repair Gone Expeditionary	1	2024	4	2024
Rapid Infrastructure Deployment	1	2024	4	2024
Amphibious Contested Logistics Solutions	1	2024	4	2024
Software Programmable Agile RF Tactical Aerial Network	1	2024	4	2024
Classified	1	2024	4	2024
Control Systems for Coordinated Operations	1	2024	4	2024
LTAMDS V Low Cost	1	2024	4	2024
Joint Tactical Edge Network	1	2024	4	2024
Low Cost Threat Emitter	1	2024	4	2024