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 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0604858F / *Tech Transition Program*							
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	-	297.254	359.045	649.545	0.000	649.545	314.135	212.222	144.985	153.594	Continuing	Continuing
640858: *AFWERX Prime*	-	0.000	111.467	130.860	0.000	130.860	88.221	88.257	20.775	0.000	Continuing	Continuing
645350: *Experimentation*	-	117.261	91.383	254.594	0.000	254.594	135.619	45.055	46.308	47.338	Continuing	Continuing
645351: *Prototyping*	-	179.993	156.195	264.091	0.000	264.091	90.295	78.910	77.902	106.256	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Tech Transition Program addresses the gap between initial system-level technology or concept development and demonstration, and successful acquisition and operational capability implementation. The Tech Transition Program matures new warfighting concepts, rapidly develops fieldable prototypes, and performs experimentation to assess military utility of transition-ready weapon systems. This program utilizes multiple approaches and integrated activities to field technology for the warfighter.

The Tech Transition Program reduces risk in emerging technology markets by partnering with industries through Prime investments and providing access to Government analysis, testing and certification capabilities. Prime investments focus on Government-Industry partnerships to influence and militarize emerging commercial capabilities to ensure US competitive advantage in key technology areas.

Experimentation efforts explore new concepts and their applications in potential future operating environments within a system-of-systems context taking risks early in the acquisition process to drive a more optimized and efficient acquisition approach significantly reducing overall acquisitions costs. One of these experimentation efforts is the Rapid Defense Experimentation Reserve (RDER) to encourage multi-component experimentation through a campaign of learning.

Prototyping enables integration and demonstration of emerging technologies to quickly move them into warfighting capability. Following strategic guidance the Department of the Air Force has institutionalized Experimentation and Prototyping to achieve smarter, faster, and more efficient acquisitions that move technologies rapidly into the most critical warfighting capabilities.

The Tech Transition Program allows acquisition program managers (the capability developers) and warfighters (the capability recipients and end users) to prototype, integrate, and demonstrate candidate technologies and assess them in an operational system of systems environment in partnership with Combatant Commanders, Major and Field Commands, Program Executive Officers, schoolhouses, simulation facilities, and development planning organizations.

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, 0605831F, and/or 0606017F. In FY 2022, $2.984 million was expended for civilian pay expenses in this program element, and in FY 2023, $3.136 million is forecasted for civilian pay expenses in this program element.

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 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*

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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	305.943	343.545	0.000	0.000	0.000
Current President's Budget	297.254	359.045	649.545	0.000	649.545
Total Adjustments	-8.689	15.500	649.545	0.000	649.545
• Congressional General Reductions	0.000	-22.500			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	72.000			
• Congressional Directed Transfers	0.000	-34.000			
• Reprogrammings	1.401	0.000			
• SBIR/STTR Transfer	-10.090	0.000			
• Other Adjustments	0.000	0.000	649.545	0.000	649.545

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Project: 640858: *AFWERX Prime*		
Congressional Add: *Program increase - Agility Prime*	-	54.000
Congressional Add Subtotals for Project: 640858	-	54.000
Project: 645350: *Experimentation*		
Congressional Add: *Program Increase - Low Cost Attritable Aircraft Technology*	48.316	-
Congressional Add: *Program Increase - Autonomous Air Combat Operations*	4.831	10.000
Congressional Add: *Congressional Add: Program increase - Small Business Research for Rocket Technology*	2.415	-
Congressional Add Subtotals for Project: 645350	55.562	10.000
Project: 645351: *Prototyping*		
Congressional Add: *Program Increase - Logistics Technologies*	8.455	0.000
Congressional Add: *Program Increase - Cold Spray and Directed Energy Deposition*	5.797	0.000
Congressional Add: *Program Increase - Massive Area Additive Manufacturing*	9.663	0.000
Congressional Add: *Program Increase - Additive Manufacturing for Metals*	9.663	0.000

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 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Congressional Add: *Program Increase - Artic Communications*	48.316	0.000
Congressional Add: *Program Increase - Heavy Payload Solar Powered UAS JCTD*	14.494	0.000
Congressional Add: *Program increase - logistics enhancements*	0.000	4.000
Congressional Add: *Program increase - alternative PNT phase III demonstration*	0.000	4.000
Congressional Add Subtotals for Project: 645351	96.388	8.000
Congressional Add Totals for all Projects	151.950	72.000

Change Summary Explanation

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.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604858F / *Tech Transition Program*	Project (Number/Name) 640858 / *AFWERX Prime*	

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
640858: *AFWERX Prime*	-	0.000	111.467	130.860	0.000	130.860	88.221	88.257	20.775	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

AFWERX Prime is a new acquisition approach that uses government-specific resources to reduce risk in emerging technology markets while partnering with investors, industry, interagency, and international partners for accelerated, affordable, and agile commercial and military capability. These Prime efforts are led by a Chief Commercialization Officer whose key responsibility is to accelerate technology commercialization for fielding of military capability. Agility Prime is the first effort in the series and will provide research, development, testing, and evaluation to field transformative vertical flight technology in 2023. These systems may incorporate non-traditional electric or hybrid propulsion for manned or optionally manned missions, with onboard, remote, or eventually autonomous control. Agility Prime will leverage commercial investment in technologies that support mobility and sustainment in benign or contested environments to enable agile, lower-cost distributed logistics, humanitarian operations, or disaster response operations.

AFWERX Prime explores associated technologies and potential follow-on Prime initiatives, such as space technologies, autonomy, high-speed capabilities, microelectronics, energy, quantum and digital engineering applications across a spectrum of technologies. Future Prime initiatives will use the same paradigm to leverage commercial technology and investment for high returns on government participation in this sector, achieving advanced, agile, and accelerated fielding of commercial and military capability bolstering national security and domestic technological dominance.

Next-Gen Large Aircraft aims to accelerate prototyping and widespread adoption of blended wing body aircraft for military and commercial applications, leveraging common goals among DOD and allied nations, commercial airlines and freight companies, other industry partners, and private investors. Cargo, tanker, and non-stealth bomber aircraft account for approximately 40% of DOD's total annual operational energy consumption, estimated to be about 1.2 billion gallons per year. Next-Gen Large Aircraft endeavors to meaningfully reduce fuel delivery logistical challenges, and prime the U.S. commercial aerospace sector to advance 21st century airframe designs in similar manner as military-developed aircraft primed commercial aircraft derivatives in the mid-20th century.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Agility Prime	0.000	57.467	73.951
Description: Execution of efforts to explore and transition emerging dual-use technologies under this new acquisition approach to include prep to field transformative vertical flight and enabling technologies. Activities include technical exchanges, research, development, certification, testing, and evaluation.			
FY 2022 Plans: Continue risk reduction ground testing with multiple aircraft manufacturers including wind tunnel, environmental, cyber penetration, and Electromagnetic Interference characterization. Continue prototype testing to characterize performance, handling qualities, and mission system effectiveness. Continue airworthiness assessments. Initiate flight tests in realistic operating environments and			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 640858 / *AFWERX Prime*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
scenarios to provide data for business case analysis and fielding. Initial research, development, testing, and evaluation of other potential technology sectors to follow this Prime acquisition paradigm. ***FY 2023 Plans:*** Continue risk reduction ground testing with multiple aircraft manufacturers including wind tunnel, environmental, cyber penetration, and Electromagnetic Interference characterization. Continue prototype testing to characterize performance, handling qualities, and mission system effectiveness. Continue airworthiness assessments aimed at providing flight certified vehicles in 2023. Continue flight tests in realistic operating environments and scenarios to provide data for business case analysis and fielding. Continue to perform initial research, development, testing, and evaluation of other potential technology sectors to follow this Prime acquisition paradigm. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 funding increased compared to FY 2022 by $16.484 million. Funding increased due to advancement of electric and hybrid vertical flight technologies resulting in increased prototyping and experimentation with these systems.			
Title: Blended Wing Body - Next Generation Large Aircraft	0.000	0.000	56.909
Description: In partnership with Defense Innovation Unit, allies, industry stakeholders, and private investors, Next-Gen Large Aircraft targets over a 30% increase in aerodynamic efficiency over traditional tube-and-wing large aircraft (given same engines), with a corresponding 30% decrease in greenhouse gas emissions. For military applications, initial analysis shows increases in combat capability greater than the percent increase in fuel efficiency for both aerial refueling and cargo aircraft productivity (e.g. 30% increase in fuel efficiency can equal 60% or more increased aerial refueling fuel offload at range). Project goals include designing an aircraft that can cost-effectively scale up and down to enable acquisition by a broader community of government and industry stakeholders. Overall effort intends to manufacture a prototype large-scale aircraft for certification and testing. This project works in coordination with DOD's Chief Sustainability Officer and the Air Force Operational Energy office. ***FY 2022 Plans:*** Not Applicable ***FY 2023 Plans:*** Execute prototype development of a blended wing body aircraft. Creation of digital environment for airframe design iteration and risk reduction. Manufacturing technology maturation and risk reduction, as well as design integration of advanced composites, non-cylindrical pressure vessel technology expanding on work done by NASA, flight control laws, and nacelle-airframe optimization. Complete initial requirements generation phase, continue vehicle and airframe design, structural analysis and component testing, and avionics and flight control system integration plan. Incorporate life-cycle sustainment cost considerations into design phase. Initial airworthiness and test planning for prototype aircraft. ***FY 2022 to FY 2023 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 640858 / *AFWERX Prime*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY 2023 funding increased compared to FY 2022 by $19.393 million, which includes the FY 2022 Congressional Add. Funding increased to the addition of a major activity, blended wing body prototyping activities to create a digital environment for airframe design and risk reduction.			
Accomplishments/Planned Programs Subtotals	0.000	57.467	130.860

	FY 2021	FY 2022
Congressional Add: Program increase - Agility Prime	-	54.000
FY 2022 Plans: Conduct Congressionally-directed efforts		
Congressional Adds Subtotals	-	54.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

This effort will proceed along the following path: 1) investigate details regarding potential commercial markets; 2) identify technologies that are likely to result in successful prototypes; 3) create collaborative test plans potentially offering test assets and expertise; 4) leverage this campaign for near-term airworthiness as well as preparation for procurement of hardware, software, data, or services. The intent is to accelerate learning to enable early adoption, procurement, and fielding. This is the process currently being executed under Agility Prime and would be continued under other future Prime initiatives.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604858F / *Tech Transition Program*	Project (Number/Name) 640858 / *AFWERX Prime*	

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
AOI 1 Performer A	Reqn	Various : Various	-	-		12.000	Oct 2021	11.127	Oct 2022	-		11.127	Continuing	Continuing	-
AOI 2 Performer A	Reqn	Various : Various	-	-		3.000	Nov 2021	3.128	Nov 2022	-		3.128	Continuing	Continuing	-
AOI 1 Performer B	Reqn	Various : Various	-	-		6.000	Jan 2022	14.127	Jan 2023	-		14.127	Continuing	Continuing	-
AOI 2 Performer B	Reqn	Various : Various	-	-		4.000	Feb 2022	3.223	Feb 2023	-		3.223	Continuing	Continuing	-
AOI 3 Performer A	Reqn	Various : Various	-	-		3.000	Dec 2021	7.127	Dec 2022	-		7.127	Continuing	Continuing	-
AOI 3 Performer B	Reqn	Various : Various	-	-		4.000	Mar 2022	9.133	Mar 2023	-		9.133	Continuing	Continuing	-
Air Race Partners	RO	Various : Various	-	-		5.000	Jun 2022	5.255	Jun 2023	-		5.255	Continuing	Continuing	-
Next Gen Large Aircraft	MIPR	DIU : Mountain View, CA	-	-		-		51.217	Dec 2022	-		51.217	Continuing	Continuing	-
Congressional Add- Agility Prime	Various	Various : Various	-	-		54.000	Sep 2022	-		-		-	Continuing	Continuing	-
		Subtotal	-	-		91.000		104.337		-		104.337	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
Modeling and Analytics Support	MIPR	Various : Various	-	-		2.000	Nov 2021	1.537	Nov 2022	-		1.537	Continuing	Continuing	-
Government Test Support	WR	Various : Various	-	-		2.000	Dec 2021	2.225	Dec 2022	-		2.225	Continuing	Continuing	-
Airworthiness and Test Support	Various	Various : Various	-	-		3.000	Nov 2021	1.137	Nov 2022	-		1.137	Continuing	Continuing	-
Next Generation Large Aircraft Test Support	MIPR	Various : Various	-	-		-		2.000	Nov 2022	-		2.000	Continuing	Continuing	-
		Subtotal	-	-		7.000		6.899		-		6.899	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 640858 / *AFWERX Prime*

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
Autonomy And Hybrid Stratfi	MIPR	Various : Various	-	-		5.000	Dec 2021	5.258	Dec 2022	-		5.258	Continuing	Continuing	-
Autonomy and Hybrid Stratfi (2)	MIPR	Various : Various	-	-		5.000	Feb 2022	5.258	Feb 2023	-		5.258	Continuing	Continuing	-
Next Gen Large Aircraft/ Test/Airworthiness	MIPR	Various : Various	-	-		-		1.863	Jan 2023	-		1.863	Continuing	Continuing	-
		Subtotal	-	-		10.000		12.379		-		12.379	Continuing	Continuing	N/A

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
AFWERX Prime Management PMA	Various	Various : Various	-	-		3.467	Dec 2021	5.416	Oct 2022	-		5.416	Continuing	Continuing	-
Next Generation Large Aircraft PMA	Various	Various : Various	-	-		-		1.829	Oct 2022	-		1.829	Continuing	Continuing	-
		Subtotal	-	-		3.467		7.245		-		7.245	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	-	-		111.467		130.860		-		130.860	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 640858 / *AFWERX Prime*

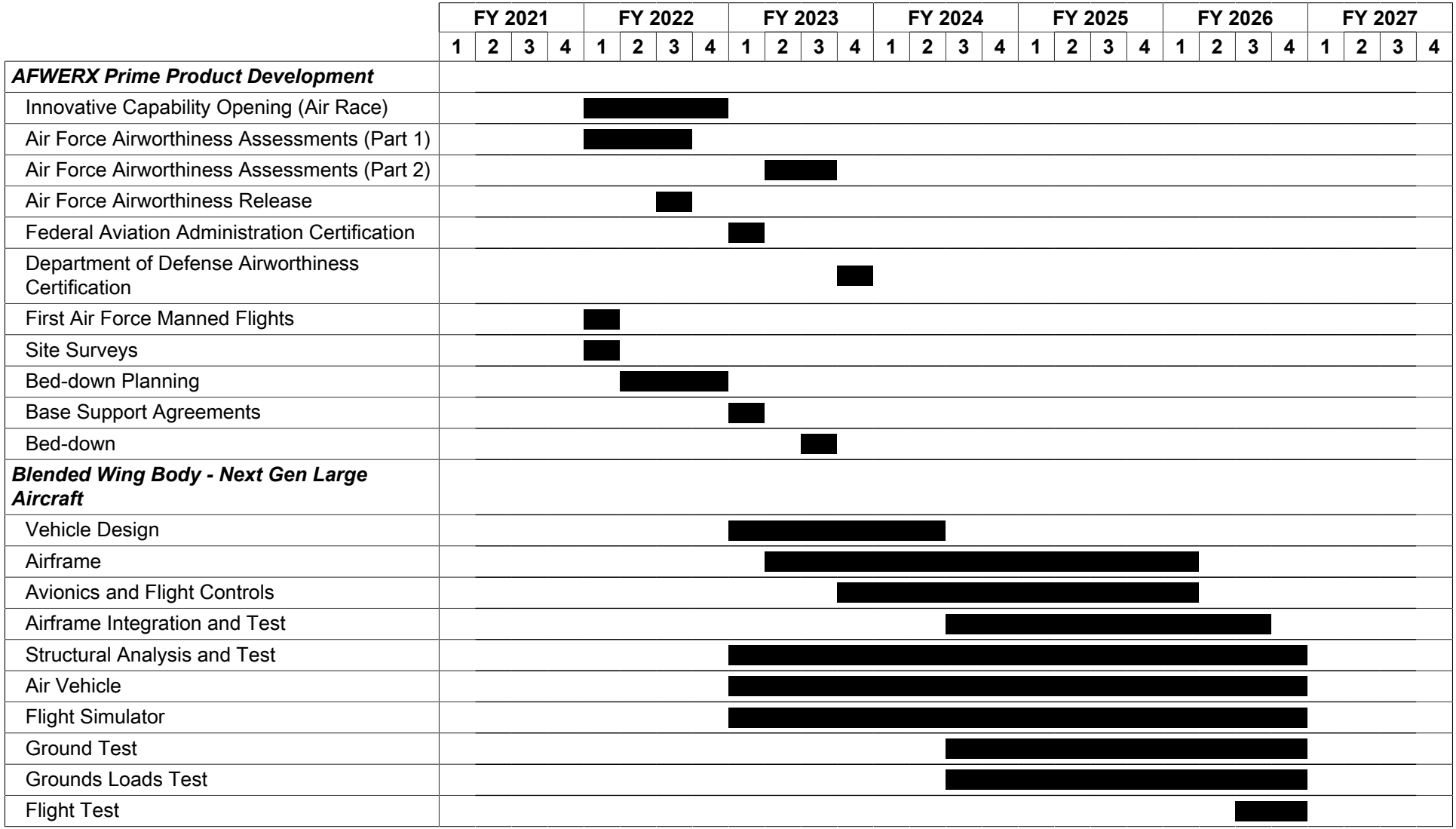

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 640858 / *AFWERX Prime*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
AFWERX Prime Product Development				
Innovative Capability Opening (Air Race)	1	2022	4	2022
Air Force Airworthiness Assessments (Part 1)	1	2022	3	2022
Air Force Airworthiness Assessments (Part 2)	2	2023	3	2023
Air Force Airworthiness Release	3	2022	3	2022
Federal Aviation Administration Certification	1	2023	1	2023
Department of Defense Airworthiness Certification	4	2023	4	2023
First Air Force Manned Flights	1	2022	1	2022
Site Surveys	1	2022	1	2022
Bed-down Planning	2	2022	4	2022
Base Support Agreements	1	2023	1	2023
Bed-down	3	2023	3	2023
Blended Wing Body - Next Gen Large Aircraft				
Vehicle Design	1	2023	2	2024
Airframe	2	2023	1	2026
Avionics and Flight Controls	4	2023	1	2026
Airframe Integration and Test	3	2024	3	2026
Structural Analysis and Test	1	2023	4	2026
Air Vehicle	1	2023	4	2026
Flight Simulator	1	2023	4	2026
Ground Test	3	2024	4	2026
Grounds Loads Test	3	2024	4	2026
Flight Test	3	2026	4	2026

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604858F / *Tech Transition Program*	Project (Number/Name) 645350 / *Experimentation*	

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
645350: *Experimentation*	-	117.261	91.383	254.594	0.000	254.594	135.619	45.055	46.308	47.338	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Experimentation project funds experimentation campaigns to explore new concepts and their applications in operationally relevant environments and within a system-of-systems warfighting context. Concepts and enabling technologies including but not limited to, airborne targeting, autonomy, spectrum warfare, artificial intelligence, machine learning, expeditionary base defense, agile combat operations, and joint all-domain operations hold great promise, yet their transition to acquisition programs and fielded capabilities is typically hampered due to uncertainties regarding their military utility and organizational adoption.
Experimentation campaigns assess hypotheses that new capabilities will deliver decisive competitive advantage against our adversaries in a dynamic threat environment. These campaigns dramatically shorten the acquisition process by delivering robust information including operational utility assessments, total life cycle cost estimates, preliminary product support strategy, reliability and maintainability metrics, operational utility assessments and Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, Facilities and Policy implications.

A key element of the experimentation campaigns is strong stakeholder partnerships and buy-in from Air Force Futures, Air Force Plans and Programs, US Space Force Futures and Integration, Office of the Assistant Secretary of the Air Force for Acquisition, Technology and Logistics, warfighting Major Commands and Combatants Commands (capability recipients/end users), Space and Missile Systems Center and Air Force Material Command (capability developers) that ensures rapid transition of capabilities when operational utility, affordability, sustainability, and industrial capacity meet the Department of Air Force needs.

Experimentation campaigns are centered on an operational level warfighting concept to provide context for assessment. They use wargaming, simulation, demonstrations, and field/flight experimentation to evolve, refine, and validate the warfighting concepts leading to solid, evidence-based materiel and non-materiel capability development approaches with associated recommendations. Experimentation campaigns improve the effectiveness of operations by refining concepts and generating new information to address challenging threats of the future which aids the fielding of advanced technologies by providing the credible evidence needed to make sound strategic decisions and investment choices. Warfighting concepts evolve based on the latest threat assessments and the Experimentation Campaigns are likewise modified to ensure the Department of the Air Force retains a competitive advantage.

The Department of the Air Force's component of the Rapid Defense Experimentation Reserve (RDER) is one of the many experimentation efforts executed within this project. 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 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.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 645350 / *Experimentation*

Experimentation is focused on rapid learning and then pivoting existing or future capability development efforts based on that knowledge to ensure the most pressing operational gaps are addressed and our warfighting advantages are preserved. Further details can be provided in the appropriate forum.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Experimentation Campaigns	61.699	81.383	190.594

Description: Execution of Experimentation Campaigns to identify the competitive advantages of operational warfighting concepts and the technologies that enable these concepts. Activities may include flight tests, operational exercises, joint-service exercises, digital engineering, system-of-systems integration facilitated workshops, wargaming, modeling and simulation, and virtual and hardware prototyping to enable experimentation campaigns.

FY 2022 Plans:
Continue experimentation campaigns to advance multi-domain operations and seek competitive advantages against our adversaries, as directed by Department of the Air Force Leadership. In FY 2022 Autonomous, Attritable Aircraft will be flown alongside operational aircraft (F-15, F-16, F-35, etc.) as part of several operational flight tests and AF exercises while the Base Defense Campaign will complete an operational experimentation effort targeting, tracking, engaging, and ultimately killing incoming live cruise missiles with a mix of existing short, medium, and long-range munitions. Software-based Electronic Warfare will be remotely deployed on operational platforms to provide 4th generation fighters the most advanced and unpredictable Electronic Warfare capability denying the adversaries ability to counter our electronic attack. Network, Collaborative, Autonomous Weapons will utilize current weapon systems and test surrogates (to reduce costs) as part of operational exercises to improve lethality and precision while reducing the number of salvos required per target. Counter-Artificial Intelligence experiments will leverage work from the intelligence communities and focus on how adversaries employ artificial intelligence algorithms and specific mechanisms to counter those applications introducing false truths and uncertainties. Agile Combat Employment operations that enable forward deployed operations to be quickly, discretely and effectively established, along with mechanisms to confuse and disorient adversaries ability to identify and track forward deployed installations will be assessed. Smaller experimentation campaigns will be undertaken to address the strategic dilemma posed at Air University's Chief of Staff of the Air Force sponsored Blue Horizons program. Only those Experimentation efforts that are deemed the absolute highest priority by the Department of the Air Force Leadership will be executed aiming to create technologies and processes that will provide the largest competitive advantages and produce the most significant dilemmas for our adversaries will be investigated or executed. Data from all efforts is provided directly to AF Futures, Secretary of the Air Force for Acquisition, Technology and Logistics, and US Space Force Futures and Integration to drive capability development decisions and inform warfighting concepts.

FY 2023 Plans:
Continue to execute Experimentation Campaigns that aim to produce competitive advantages against near-peer adversaries and advance multi-domain operations to bring a convergence of effects, as directed by Department of the Air Force Leadership.
- In FY 2023 the App Enabled Rapidly Reprogrammable EW/EMS Systems (AERRES) program will demonstrate Artificial Intelligence/ Machine Learning Electromagnetic Spectrum (EMS) algorithms and assess the competitive advantages of these algorithms on several operational platforms in tactical operations extending the capability of 4th gen Aircraft.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 645350 / *Experimentation*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
- Following the live fire joint service, Operational Experimentation test event with an international partner, the Base Defense Experimentation efforts will assess the maintainability, reliability, and suitability of the National Advanced Surface to Air Missile System (NASAMS) in OCONUS operations as part of Joint Service operations in partnership with EUCOM. - As part of the ADAIR-UX Experimentation effort, the Strategic Development Planning and Experimentation office will partner with Major Commands and Program Executive Offices to build and execute operational experimentation efforts focused on the implementation of Autonomous Air Platforms in key operational tests, operational training exercises, and joint-service campaigns. These efforts will focus on operational experimentation and prototyping of an unmanned adversary air platform for use in pilot training. This will transition advancements pioneered through the Skyborg effort and industry advancements to produce initial fielded capability. The autonomous vehicle produced through these efforts will employ an open architecture approach providing an avenue for rapid adoption of future technology advancements. - The Department of Defense is actively pushing the development and fielding of numerous Artificial Intelligence systems that are required to be "safe, secure, and robust". The Strategic Development Planning and Experimentation office will also lead the Counter-Artificial Intelligence Experimentation efforts that will collaborate with industry Artificial Intelligence/Machine Learning leaders and service labs to assess vulnerabilities of codes that are being developed, tested, and implemented in air platforms. Leveraging the findings from the Intelligence Community, efforts will not only identify susceptibilities in Department of the Air Force systems, but also seek opportunities to counter and exploit adversary Artificial Intelligence platforms. The Air Force has long maintained a tactical advantage against any and all adversaries in the utilization and employment of the E-3 Airborne Warning & Control System (AWACS) to identify, track, and target enemy airborne platforms. Experimentation efforts will focus on determining how the Air Force can maintain this competitive advantage by assessing Artificial Intelligence/Machine Learning algorithms employed on several different autonomous air platforms in tactical operations and joint exercises. Experimentation efforts will continue to identify and evaluate potential game-changing Agile Combat Employment operations that enable Air Force expeditionary operations in austere, difficult to locate positions. - Smaller experimentation campaigns will be undertaken to address the strategic dilemma posed at Air University's Chief of Staff of the Air Force sponsored Blue Horizons program. Only those Experimentation efforts that are deemed the absolute highest priority by the Department of the Air Force Leadership will be executed aiming to create technologies and processes that will provide the largest competitive advantages and produce the most significant dilemmas for our adversaries will be investigated or executed. Data from all efforts is provided directly to AF Plans and Programs (A8), Futures (5/7), Secretary of the Air Force for Acquisition, Technology and Logistics (AQ), and US Space Force Futures and Integration (S8), and the Space Warfighting Analysis Center (SWAC) to drive capability development			
FY 2022 to FY 2023 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY 2023 funding increased compared to FY 2022 by $109.211 million. Funding increased due to addition of efforts to perform experimentation on unmanned adversary air platform for use in pilot training and also due to focus on operational utilities of technologies and techniques to disrupt adversarial threats.			
Title: Rapid Defense Experimentation Reserve	0.000	0.000	64.000
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 projects 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. ***FY 2022 Plans:*** Not Applicable ***FY 2023 Plans:*** RDER efforts include the following efforts: CONCEAD, TURUL, Global Thunder, and RDER Classified Effort # 2 (further details available on the appropriate forum). - CONCEAD: will develop and flight demonstrate precision RF synchronization open-architecture prototypes for enhanced sensing and disruptive electromagnetic spectrum (EMS) capability. CONCEAD 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			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
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 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. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 funding increased compared to FY 2022 by $64.000 million. Funding increased due to the addition of OSD directed efforts to facilitate rapid modernization through Rapid Defense Experimentation.			
Accomplishments/Planned Programs Subtotals	61.699	81.383	254.594

	FY 2021	FY 2022
Congressional Add: Program Increase - Low Cost Attritable Aircraft Technology ***FY 2021 Accomplishments:*** Conduct Congressionally-directed efforts	48.316	-
Congressional Add: Program Increase - Autonomous Air Combat Operations ***FY 2021 Accomplishments:*** Conduct Congressionally-directed efforts ***FY 2022 Plans:*** Conduct Congressionally - Directed Efforts	4.831	10.000
Congressional Add: Congressional Add: Program increase - Small Business Research for Rocket Technology ***FY 2021 Accomplishments:*** Conduct Congressionally - Directed Efforts	2.415	-
Congressional Adds Subtotals	55.562	10.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Experimentation campaigns will aid the advancement and transition of advanced technologies by providing the credible evidence decision makers need to make sound strategic decisions and investment choices, to provide the warfighter with advanced capabilities. Air Force Futures, Air Force Plans and Programs, US Space Force Futures and Integration, and the Office of the Assistant Secretary of the Air Force for Acquisition, Technology and Logistics direct experimentation campaigns. The Air

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
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Force Strategic Development Planning and Experimentation (SDPE) Office located at Wright-Patterson Air Force Base, Ohio and Eglin Air Force Base manages and executes each experimentation campaign. Contracting strategies vary based on the activities of each campaign.
Global Thunder: The system will be acquired through a full-and-open competition using the existing AFRL Defense Experimentation Using the Commercial Space Internet (DEUCSI) solicitation and a new Acquisition Strategy is not required.

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
Experimentation Campaigns	C/Various	Various : Various	-	0.000	Sep 2021	5.205	Sep 2022	4.733	Mar 2023	-		4.733	Continuing	Continuing	-
Experimentation Campaign Hawkeye Contract 1	C/CPAF	L3 Harris : Salt Lake City, UT	-	1.500	Apr 2021	-		-		-		-	Continuing	Continuing	-
Experimentation Campaign Hawkeye Contract 2	C/CPFF	Lockheed : Fort Worth, TX	-	0.700	Mar 2021	-		-		-		-	Continuing	Continuing	-
Experimentation Campaign Hawkeye Contract 3	C/CPFF	Space X : Hawthorne, CA	-	4.763	Dec 2021	3.903	Aug 2022	-		-		-	Continuing	Continuing	-
Experimentation Campaign Hawkeye Contract 4	Various	Various : Various	-	-		5.666	Sep 2022	10.000	Dec 2022	-		10.000	Continuing	Continuing	-
Experimentation Campaigns Hawkeye Contract 5	Various	Various : Various	-	-		-		18.000	Nov 2022	-		18.000	Continuing	Continuing	-
Experimentation Campaign Hawkeye Contract 6	Various	Various : Various	-	-		-		2.000	Dec 2022	-		2.000	Continuing	Continuing	-
Rapid Defense Experimentation Reserve (RDER) CONCEAD	Various	Various : Various	-	-		-		18.000	Mar 2023	-		18.000	Continuing	Continuing	-
Rapid Defense Experimentation Reserve (RDER) Global Thunder	Various	Various : Various	-	-		-		20.000	Dec 2022	-		20.000	Continuing	Continuing	-
Rapid Defense Experimentation Reserve (RDER) Classified	Various	Various : Various	-	-		-		15.000	Nov 2022	-		15.000	Continuing	Continuing	-
Rapid Defense Experimentation Reserve (RDER) TURUL	Various	Various : Various	-	-		-		11.000	Jan 2023	-		11.000	Continuing	Continuing	-
Experimentation Campaign Autonomous Attritable Aircraft	Various	Various : Various	-	1.387	Aug 2021	0.236	Aug 2022	-		-		-	Continuing	Continuing	-
Experimentation Campaign Hawkeye Contract 4	C/CPFF	Raytheon : McKinney,, TX	-	5.401	Dec 2021	-		-		-		-	Continuing	Continuing	-
Experimentation Campaign Hawkeye Contract 5	Various	Various : Various	-	0.500	Oct 2021	-		-		-		-	Continuing	Continuing	-

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
Experimentation Campaign Autonomous Attritable Aircraft Contract 1	C/CPFF	Lockheed : Palmdale, CA	-	1.662	Jul 2021	0.500	Jul 2022	2.000	Jul 2023	-		2.000	Continuing	Continuing	-
Experimentation Campaign Autonomous Attritable Aircraft Contract 2	C/CPFF	Kratos : Colorado Springs, CO	-	3.140	May 2021	0.000	May 2022	2.000	May 2023	-		2.000	Continuing	Continuing	-
Experimentation Campaign Autonomous Attritable Aircraft Contract 3	C/CPFF	Calspan : Buffalo, NY	-	3.892	Jul 2021	0.400	Jul 2022	2.000	Jul 2023	-		2.000	Continuing	Continuing	-
Experimentation Campaign Autonomous Attritable Aircraft Contract 4	C/CPAF	Leidos : Reston, VA	-	1.060	Sep 2021	0.000	Sep 2022	2.000	Sep 2023	-		2.000	Continuing	Continuing	-
Experimentation Campaign Autonomous Attritable Aircraft Contract 5	C/CPAF	Infoscitex : Dayton, OH	-	0.940	Jun 2021	0.000	Jun 2022	2.000	Jun 2023	-		2.000	Continuing	Continuing	-
Experimentation Campaign Autonomous Attritable Aircraft Contract 6	C/CPAF	Fregata : St Louis, MO	-	1.117	Dec 2021	0.389	Dec 2022	2.000	Dec 2023	-		2.000	Continuing	Continuing	-
Experimentation Campaign Autonomous Attritable Aircraft Contract 7	C/CPAF	GRE OTA : FL	-	-		5.900	Sep 2022	-		-		-	Continuing	Continuing	-
Experimentation Campaign Blue Horizons	Various	Various : Various	-	2.823	Jul 2021	2.915	Sep 2022	2.250	Dec 2022	-		2.250	Continuing	Continuing	-
Experimentation Campaign Base Defense Gun Weapon System 1	C/CPFF	Raytheon : Tucson, AZ	-	2.447	Jun 2021	18.500	Jul 2022	7.000	Jan 2023	-		7.000	Continuing	Continuing	-
Experimentation Campaign Base Defense Gun Weapon System 2	C/CPAF	Various : Various	-	-		2.435	Sep 2022	-		-		-	Continuing	Continuing	-
Experimentation Campaign Base Defense National Advanced Surface to Air Missile System	C/CPFF	BAE : Minneapolis, MN	-	0.174	Oct 2021	0.000	Aug 2022	12.000	Dec 2022	-		12.000	Continuing	Continuing	-
Experimentation Campaign Counter AI	C/CPAF	Various : Various	-	-		5.000	Sep 2022	-		-		-	Continuing	Continuing	-

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
Experimentation Campaign PNT	Various	Various : Various	-	0.861	Sep 2021	0.000	Sep 2022	-		-		-	Continuing	Continuing	-
Experimentation Campaign AERRES	Various	Various : Various	-	3.954	Mar 2021	10.917	Sep 2022	6.500	Dec 2022	-		6.500	Continuing	Continuing	-
Experimentation Campaign AMTI	Various	Various : Various	-	-		1.800	Sep 2022	5.000	Feb 2023	-		5.000	Continuing	Continuing	-
Experimentation Campaign Agile Combat Employment	Various	Various : Various	-	-		-		5.000	Dec 2022	-		5.000	Continuing	Continuing	-
Congressional Add - Low Cost Attritable Aircraft Technology	C/Various	Various : Various	-	48.316	Mar 2022	-		-		-		-	0.000	48.316	-
Congressional Add - Autonomous Air Combat Operations	Various	Various : Various	-	4.831	Jun 2021	10.000	Sep 2022	-		-		-	0.000	14.831	-
Experimentation Campaign Unmanned Adversary Air (ADAIR UX)	Various	Various : Various	-	-		-		67.607	Jul 2023	-		67.607	Continuing	Continuing	-
		Subtotal	-	89.468		73.766		216.090		-		216.090	Continuing	Continuing	N/A

Remarks

Experimentation is focused on rapid learning and then pivoting based on that learning. Therefore, specific plans are not detailed to prevent locking into an approach that will likely shift based on current experimentation efforts. Further budget details can be provided in the appropriate forum.

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
Experimentation Campaign Support	Various	Various : Various	-	2.435	Mar 2021	0.225	Mar 2022	4.128	Mar 2023	-		4.128	Continuing	Continuing	-
Experimentation Campaign Autonomous Attritable Aircraft Support 1	MIPR	Perduco/GSA : O'Fallon, IL	-	1.401	Aug 2021	2.000	Nov 2021	5.200	Nov 2022	-		5.200	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
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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
Experimentation Campaign Autonomous Attritable Aircraft Support 2	MIPR	OO-ALC : Ogden, UT	-	0.591	Jul 2021	0.700	Sep 2022	-		-		-	Continuing	Continuing	-
Experimentation Campaign Airpiercer	MIPR	WHS : Alexandria, VA	-	0.300	Aug 2021	-		-		-		-	Continuing	Continuing	-
Experimentation Campaign Hawkeye	Various	Various : Various	-	0.224	Dec 2021	0.717	Dec 2022	-		-		-	Continuing	Continuing	-
Experimentation Campaign Base Defense	MIPR	Various : Various	-	4.040	Dec 2021	2.845	Sep 2022	4.000	Nov 2022	-		4.000	Continuing	Continuing	-
Experimentation Campaign Blue Horizons	MIPR	DOE : Oak Ridge, TN	-	0.176	Aug 2021	-		0.250	Nov 2022	-		0.250	Continuing	Continuing	-
Experimentation Campaign AERRES 1	MIPR	AAFC/AFR : Adelphi, MD	-	0.300	Mar 2022	-		0.500	Oct 2022	-		0.500	Continuing	Continuing	-
Experimentation Campaign AERRES 2	MIPR	SWRI : TBD	-	-		0.300		-		-		-	Continuing	Continuing	-
Experimentation Campaign Floatplane	MIPR	Various : Various	-	3.506	Sep 2021	-		-		-		-	Continuing	Continuing	-
Experimentation Campaign PNT	MIPR	DTIC : Ft Belvoir, VA	-	0.860	Sep 2021	-		-		-		-	Continuing	Continuing	-
Experimentation Campaign AMTI	Various	Various : Various	-	-		0.000	Sep 2022	1.000	Oct 2022	-		1.000	Continuing	Continuing	-
		Subtotal	-	13.833		6.787		15.078		-		15.078	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
Experimentation Campaign Test and Evaluation	MIPR	Various : Various	-	2.457	Oct 2021	0.000	Dec 2021	2.980	Dec 2022	-		2.980	Continuing	Continuing	-
Experimentation Campaign Hawkeye	Various	Various : Various	-	1.562	Oct 2021	3.014	Jun 2022	-		-		-	0.000	4.576	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
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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
Experimentation Campaign Autonomous Attritable Aircraft T&E 1	MIPR	Various : Various	-	1.778	Sep 2021	0.775	Apr 2022	6.100	Apr 2023	-		6.100	Continuing	Continuing	-
Experimentation Campaign Autonomous Attritable Aircraft T&E 2	MIPR	Army : Redstone Arsenal, AL	-	1.084	Sep 2021	-		-		-		-	Continuing	Continuing	-
Experimentation Campaign AERRES 1	MIPR	96 OSS : Eglin AFB, FL	-	1.216	Aug 2021	0.000	Dec 2021	3.770	Dec 2022	-		3.770	Continuing	Continuing	-
Experimentation Campaign AERRES 2	MIPR	586th : CA	-	-		1.320		-		-		-	Continuing	Continuing	-
Experimentation Campaign Base Defense	MIPR	Various : Various	-	0.334	Aug 2021	0.000	Dec 2021	4.000	Oct 2022	-		4.000	Continuing	Continuing	-
Blue Horizons	Various	Various : Various	-	-		-		1.000	Nov 2022	-		1.000	Continuing	Continuing	-
Experimentation Campaign Counter AI	Various	Various : Various	-	0.300	Mar 2022	0.000	Jun 2022	-		-		-	Continuing	Continuing	-
Experimentation Campaign PNT	Various	Various : Various	-	0.115	Sep 2021	-		-		-		-	Continuing	Continuing	-
Experimentation Campaign RPT	MIPR	96th TW : Eglin AFB, FL	-	0.300	May 2021	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	9.146		5.109		17.850		-		17.850	Continuing	Continuing	N/A

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
Experimentation Campaign Contractor Support	Various	Various : Various	-	0.083	Mar 2021	0.233	Dec 2021	0.266	Oct 2022	-		0.266	Continuing	Continuing	-
Experimentation Campaign Program Management Administration Costs	Various	Various : Various	-	4.731	Mar 2022	5.488	Jan 2022	5.310	Nov 2022	-		5.310	Continuing	Continuing	-
		Subtotal	-	4.814		5.721		5.576		-		5.576	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
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	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	-	117.261		91.383		254.594		-		254.594	Continuing	Continuing	N/A

Remarks

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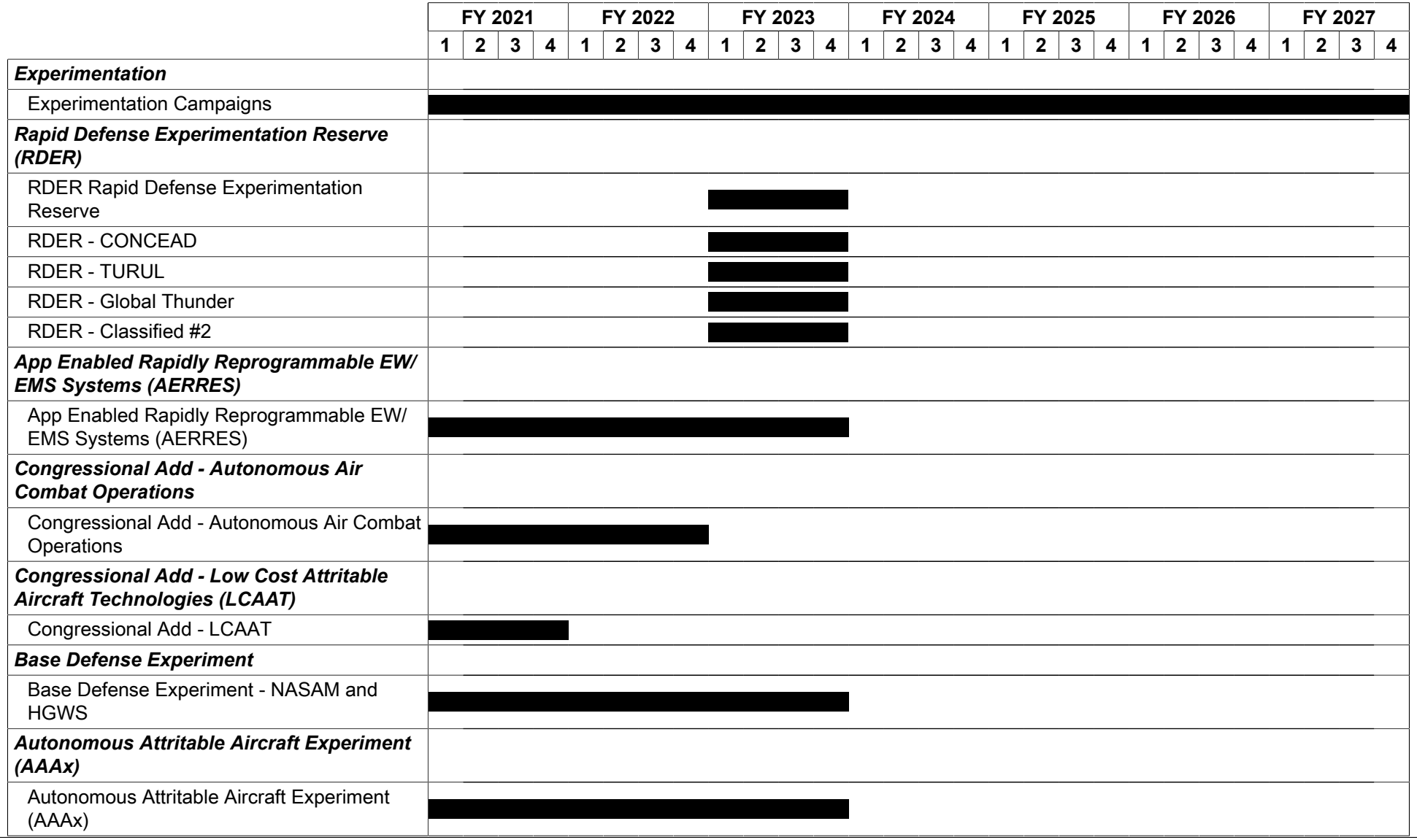

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
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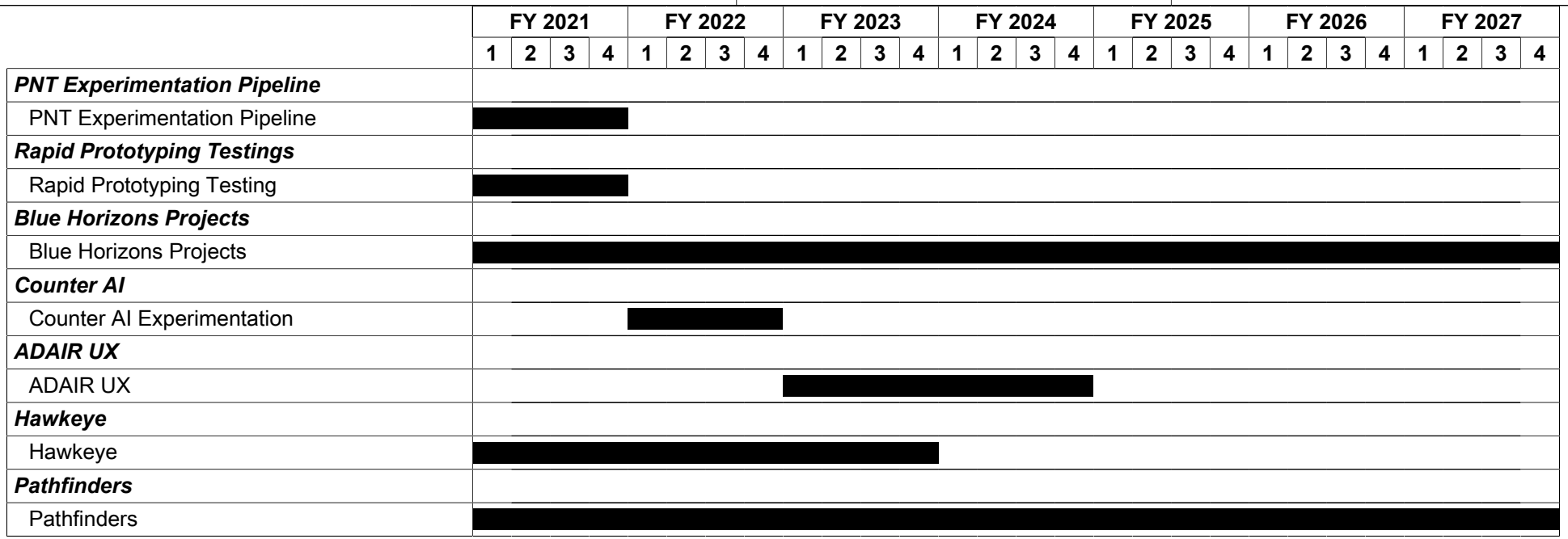

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
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Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Experimentation				
Experimentation Campaigns	1	2021	4	2027
Rapid Defense Experimentation Reserve (RDER)				
RDER Rapid Defense Experimentation Reserve	1	2023	4	2023
RDER - CONCEAD	1	2023	4	2023
RDER - TURUL	1	2023	4	2023
RDER - Global Thunder	1	2023	4	2023
RDER - Classified #2	1	2023	4	2023
App Enabled Rapidly Reprogrammable EW/EMS Systems (AERRES)				
App Enabled Rapidly Reprogrammable EW/EMS Systems (AERRES)	1	2021	4	2023
Congressional Add - Autonomous Air Combat Operations				
Congressional Add - Autonomous Air Combat Operations	1	2021	4	2022
Congressional Add - Low Cost Attritable Aircraft Technologies (LCAAT)				
Congressional Add - LCAAT	1	2021	4	2021
Base Defense Experiment				
Base Defense Experiment - NASAM and HGWS	1	2021	4	2023
Autonomous Attritable Aircraft Experiment (AAAx)				
Autonomous Attritable Aircraft Experiment (AAAx)	1	2021	4	2023
PNT Experimentation Pipeline				
PNT Experimentation Pipeline	1	2021	4	2021
Rapid Prototyping Testings				
Rapid Prototyping Testing	1	2021	4	2021
Blue Horizons Projects				

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
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	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Blue Horizons Projects	1	2021	4	2027
Counter AI				
Counter AI Experimentation	1	2022	4	2022
ADAIR UX				
ADAIR UX	1	2023	4	2024
Hawkeye				
Hawkeye	1	2021	4	2023
Pathfinders				
Pathfinders	1	2021	4	2027

Note

Experimentation is focused on rapid learning and then pivoting based on that learning. They are used to determine the competitive advantage a technology or warfighting concept can have over our adversaries and ascertain operational utility. Often Experimentation Campaigns uncover new ways to use existing technology or how to exploit new Science and Technology for our competitive gain. Further schedule details regarding individual experimentation campaigns can be provided in the appropriate forum.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604858F / *Tech Transition Program*	Project (Number/Name) 645351 / *Prototyping*	

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
645351: *Prototyping*	-	179.993	156.195	264.091	0.000	264.091	90.295	78.910	77.902	106.256	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Prototyping project enables demonstration of emerging technologies in an operational environment to determine and evaluate the completive advantage against our adversaries and how the technology is integrated into the future fight.

Lifecycle Prototyping investments focus on three major thrusts (1) advancing capabilities of legacy weapon systems, (2) militarizing novel mature commercial technologies, and (3) exploring partnerships with Department of the Air Force Program Executive Officers to rapidly transition technologies that are being developed as part of the Department of Air Force Vanguard programs. Prototype project investments that advance capabilities of legacy weapon systems focus on kinetic energy effectors for base defense and expeditionary employment operations, a multi-source resilient Position Navigation and Timing pod, and software defined electronic warfare and communication capabilities. Prototype projects that seek to militarize novel mature commercial technologies will focus on artificial intelligence, autonomy, cyber warfare capabilities, digital engineering, and novel weapon and aircraft technologies. Finally, prototype projects that explore partnerships will invest in risk reduction activities in partnership with the Department of the Air Force Program Executive Officers assigned to each of the Department of the Air Force Vanguard Programs to ensure rapid and seamless transition of Science and Technology into warfighting capabilities.

The NC3 Commercial Development/Prototyping project advances and extends the tech transitions from a previous and successful prototyping effort called Global Lightning. Under NC3 Commercial Development/Prototyping communication terminals will be prototyped with full multi-vendor, multi-orbit, multi-band capability, achieve the ability to switch between constellations seamlessly, and extend this capability to a new class of Department of Defense and Department of the Air Force missions specified by the Office of the Secretary of Defense. The effort will also Prototype a capability that allows dynamic switching between these paths, and/or sharing of the data stream across multiple paths to create a highly-resilient communication architecture against all major adversary threats. Under this effort, terminals will be prototyped and tested on eight types of AF air platforms and additional platforms across the other domains. The effort will then work with the Program Executive Offices to achieve tech transition of the terminals across the full fleet, and to secure commercial agreements to tech transition the operational services through the United States Space Force Program Executive Offices. (Additional details available through proper channels).

the Operational Energy thrust seeks to improve operational efficiency for aircraft and logistics systems through focused prototyping. These efforts include drag reduction improvements to legacy aircraft and advancement of planning and scheduling tools. Operational energy software development, test, and deployment includes feature improvement operational tools, enablement of data analytics for decision advantage, and prototyping of new applications to improve mission effectiveness and energy intensity of operations. Operational energy efforts support technology development that aims to optimize Mobility Air Forces allocation and long range planning, unit readiness, and tactical and operational cargo planning processes. Operational energy efforts allow modeling and simulation to help DOD members understand the energy effects of decisions and the impacts on the total force, enabling better decision making and a more proactive energy posture

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Lifecycle Prototyping	83.605	148.195	89.091

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Description: Following Strategic Department of Defense and Department of the Air Force direction cross-functional teams composed of operators, technologists, engineers, acquisition, and requirements personnel from across the Department of the Air Force execute Prototyping Campaigns to determine if and how much of a competitive advantage these systems can produce against our adversaries. Developmental Prototypes are an opportunity to understand the operational utility of a new warfighting concept or technology, while avoiding the pitfalls of entering into a lengthy, formal acquisition program without the requisite knowledge of performance trade-offs and technical and programmatic risks. Prototypes integrated into carefully crafted operational Experimentation Campaigns provide immediate feedback to Department of the Air Force senior leaders driving rapid acquisition or divestment with minimal resources. Prototype efforts provide an initial capability if warranted that can act as a catalyst for future rapid acquisition. Exploring innovative prototypes that range across the full Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, Facilities and Policy spectrum gives Department of the Air Force senior leaders a quicker understanding of the potential operational utility, leading to better decisions on what to pursue with limited acquisition resources. ***FY 2022 Plans:*** Continue and complete the transition of space internet (global lightning) prototyping efforts to existing programs of record to enable Giga-byte/second class data rates and low latency across multiple platforms. In FY 2022 final integration and flight testing will occur on 5th Gen fighters and long range bomber platforms. Upon completion of the final design and integration into operational command and control systems the Hypervelocity Gun Weapon System will be tested against long-range cruise missile threats. Assessment of system sustainment and maintainability in austere conditions will also be evaluated. The palletized munitions prototype will continue to conduct live fire testing of JASSM-ER cruise missiles from a C-17 and additional flight testing will investigate mixed munition payloads deployed in mass (up to 36 munitions per aircraft) utilizing operational cargo aircraft (C-17 and C-130). Field initial Autonomous Aircraft prototypes integrating them into existing standards and operations while assessing sensors and platforms in an operational airborne environment. The Regional Operating Picture Initiative will field Wave Relay communications equipment across Malmstrom AFB, MT, to provide real-time status of nuclear missile personnel and equipment. Additional prototyping activities for emerging technologies may be conducted in support of the Air Force Futures warfighting campaigns to inform future Department of the Air Force warfighting strategies and concepts. ***FY 2023 Plans:*** Continue to integrate operational prototypes into Experimental Campaigns to determine the feasibility and evaluate the strategic military advantage these capabilities present against adversaries. - A Rapid Dragon (palletized munitions) operational prototype will be built and will launch heterogeneous weapon loads identified by Department of the Air Force senior leaders that will provide strategic advantages against China and other peer adversaries. Palletized munition prototypes will be built and integrated into Joint Operations and Allied Partner exercises to understand the operational advantages that can be exploited across services and strategic allied partners.			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 645351 / *Prototyping*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
- A C-130 transportable/deployable Hypervelocity Ground Weapon System (HGWS) prototype will be built and integrated into a Joint-Service operation that will rapidly deploy the HGWS prototype, integrate the system into an existing joint service battle management system, and test its effectiveness against incoming cruise missiles as part of a life fire experiment. The HGWS prototype will rapidly deploy to a remote location to understand the effectiveness of expeditionary operations. - Autonomous Aircraft efforts will build and conduct operational experimentation efforts implementing proven artificial intelligence architectures and algorithms from AFRL, DOD-service partners, Industry, and Allied partners integrated into existing operational aircraft. In addition, prototype efforts will focus not on solely building and understanding the competitive advantages of an Artificial Intelligence-fueled platform, but also in understanding the infrastructure required to maintain vehicle operations including deployment of advanced software on a flight line, acquiring and cataloguing sensor data, and exploring unique waveforms to connect these platforms to traditional manned assets. - The Regional Operating Picture initiative will deploy Wave Relay Mobile Ad-Hoc Network communications equipment at Minot Air Force Base North Dakota and FE Warren Air Force Base Wyoming to provide seamless digital Command, Control, and Communications and real-time status of all intercontinental ballistic missile (ICBM) personnel and equipment across the entire 90th and 91st Missile Wings. Only those Prototype efforts that are deemed the absolute highest priority by the Department of the Air Force Leadership will be executed aiming to create technologies and processes that will provide the largest competitive advantages and produce the most significant dilemmas for our adversaries will be investigated or executed. Data from all efforts is provided directly to AF Plans and Programs (A8), Futures (5/7), Secretary of the Air Force for Acquisition, Technology and Logistics (AQ), and US Space Force Futures and Integration (S8), and the Space Warfighting Analysis Center (SWAC) to drive capability development decisions and inform warfighting concepts. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 funding decreased compared to FY 2022 by $59.104 million, funding decreased due to completion of Global Lightning efforts. Follow-on efforts to Global Lighting are handled by F-35 Joint Program Office and noted in the noted in the Experimentation Project RDER - Global Thunder effort and in the Prototyping Project Nuclear Command, Control, and Communications (NC3) Commercial Development/Prototyping effort. Operational Energy Efforts were also segregated into a separate effort.			
Title: NC3 Commercial Development/Prototyping ***Description:*** Under the previous Global Lighting effort new satellite communications (SATCOM) terminals were successfully prototyped onto 3 primary DAF air platforms (AC-130, KC-135, F-35) to test the new emerging capability. The F-35 terminal under Global Lightning officially transitioned by the Joint Executive Steering Board (JESB) which approved the Requirements change to add this capability to the F-35 Joint Program Office Program of Record.	0.000	0.000	117.000

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023

The Nuclear Command, Control, and Communications (NC3) Commercial Development/Prototyping thrust now advances the successful Global Lightning SATCOM capability to the full multi-vendor, multi-orbit, multi-band capability needed to create a global fully-assured DOD communications capability. The NC3 Commercial Development/Prototyping thrust will also extend this capability to a new class of DOD and DAF missions specified by OSD (details available through proper channels). Under this effort, terminals will be prototyped and tested on 8 types of AF air platforms, and some platforms across the other domains. The terminals include secure connectivity using NSA-approved approaches, and authority approvals at least to the interim levels needed for experimentation (IATT). The effort will also explore options for securely integrating the capability into the new mission area and determining mission improvement and addressing potential policy, legal, doctrine issues that are often concomitant with a new capability.

Whereas Global Lightning allows connection to individual SATCOM paths in LEO and GEO, the NC3 Commercial Development/ Prototyping thrust will increase the SATCOM terminal capability to connect to multiple (7) SATCOM paths in low earth orbit (LEO), medium earth orbit (MEO), and geosynchronous orbit (GEO). The inclusion of commercial vendors will dramatically increase. Each of these new commercial systems offer unique attributes to DOD. The new multi-vendor terminals will also create the ability to seamless switch between vendors, and also quickly bring in new commercial vendors as they emerge, thus ensuring low-cost options for DOD in the foreseeable future. In addition to the NC3 Commercial Development/Prototyping options, the terminal will also provide connectivity to new and emerging DOD SATCOM systems, using a built-in software-defined radio (SDR) capability that can accommodate government protected waveforms. To improve communications options and resiliency, the NC3 Commercial Development/Prototyping effort will also prototype, test and transition a capability that allows dynamic switching between the SATCOM options in multiple orbits, government and commercial, and between multiple commercial vendors.

FY 2022 Plans:
Not Applicable

FY 2023 Plans:
Evaluation of 6 platforms identified by OSD to determine compatibility options. Initiation of integration engineering on 6 platforms through contract awards to the support contractor associated with each platform. Complete competitive contract awards to multi-vendor terminal providers (multiple awards). The Terminal includes both the radio and the antennas. Complete contract awards to FFRDCs such as RAND, John Hopkins Applied Physics Lab, IDA to analyze system performance in the new mission set, and identify key doctrine, policy, training, sustainment and other potential acquisition and operations issues. Initiate negotiations with Amazon Kuiper, Telesat, SES, Viasat, others to determine optimal approach for integrating their SATCOM into the terminals (eg, ASIC modems vs a software-defined waveform).

FY 2022 to FY 2023 Increase/Decrease Statement:

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY 2023 funding increased compared to FY 2022 by $117.000 million. Funding increased due to the addition of major activities to include Commercial SATCOM. This effort is not a new start.			
Title: Operational Energy	-	0.000	58.000
Description: Operational energy prototyping efforts include both hardware prototypes that seek to improve the efficency of legacy aircraft and also software development, test, and deployment to improve mission effectiveness and energy intensity of operations. These efforts will optimize Mobility Air Forces allocation and long range planning, unit readiness, and tactical and operational cargo planning processes. ***FY 2022 Plans:*** Improve operational efficiency for aircraft and logistics systems through focused prototyping. In accordance with congressional direction in FY 2022 these efforts were transferred to the Operational Energy and Installation Resilience Program Element 0604860F. ***FY 2023 Plans:*** Operational energy software development, test, and deployment includes feature improvement operational tools, enabling of data analytics for decision advantage, and prototyping of new applications to improve mission effectiveness and energy intensity of operations. Operational energy efforts support technology development that aims to optimize Mobility Air Forces allocation and long range planning, unit readiness, and tactical and operational cargo planning processes. Operational energy efforts allow modeling and simulation to help DOD members understand the energy effects of decisions and the impacts on the total force, enabling better decision making and a more proactive energy posture. Operational Energy legacy aircraft drag reduction prototyping and demonstration efforts seek to improve the aerodynamic efficiency of legacy aircraft including the C-17, C-130, and KC-135. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 funding increased compared to FY 2022 by $58.000 million. Funding increased due to separation of efforts from the prototyping thrust. This effort is not a new start. In accordance with congressional direction in FY 2022 these efforts were transferred to the Operational Energy and Installation Resilience Program Element 0604860F.			
Accomplishments/Planned Programs Subtotals	83.605	148.195	264.091

	FY 2021	FY 2022
Congressional Add: Program Increase - Logistics Technologies ***FY 2021 Accomplishments:*** Conduct Congressionally-directed efforts ***FY 2022 Plans:*** Not Applicable	8.455	0.000
Congressional Add: Program Increase - Cold Spray and Directed Energy Deposition	5.797	0.000

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	FY 2021	FY 2022
FY 2021 Accomplishments: Conduct Congressionally-directed efforts ***FY 2022 Plans:*** Not Applicable		
Congressional Add: Program Increase - Massive Area Additive Manufacturing ***FY 2021 Accomplishments:*** Conduct Congressionally-directed efforts ***FY 2022 Plans:*** Not Applicable	9.663	0.000
Congressional Add: Program Increase - Additive Manufacturing for Metals ***FY 2021 Accomplishments:*** Conduct Congressionally-directed efforts ***FY 2022 Plans:*** Not Applicable	9.663	0.000
Congressional Add: Program Increase - Artic Communications ***FY 2021 Accomplishments:*** Conduct Congressionally - directed efforts ***FY 2022 Plans:*** Not Applicable	48.316	0.000
Congressional Add: Program Increase - Heavy Payload Solar Powered UAS JCTD ***FY 2021 Accomplishments:*** Conduct Congressionally-directed efforts ***FY 2022 Plans:*** Not Applicable	14.494	0.000
Congressional Add: Program increase - logistics enhancements ***FY 2021 Accomplishments:*** Not Applicable ***FY 2022 Plans:*** Conduct Congressionally-directed efforts	0.000	4.000
Congressional Add: Program increase - alternative PNT phase III demonstration ***FY 2021 Accomplishments:*** Not Applicable ***FY 2022 Plans:*** Conduct Congressionally-directed efforts	0.000	4.000
Congressional Adds Subtotals	96.388	8.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

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D. Acquisition Strategy

Prototyping campaigns will aid the advancement and transition of advanced technologies by providing the credible evidence decision makers need to make sound strategic decisions and investment choices, to provide the warfighter with advanced capabilities. Air Force Futures, Air Force Plans and Programs, US Space Force Futures and Integration, and the Office of the Assistant Secretary of the Air Force for Acquisition, Technology and Logistics direct experimentation campaigns. The Air Force Strategic Development Planning and Experimentation (SDPE) Office located at Wright-Patterson Air Force Base, Ohio and Eglin Air Force Base manages and executes each experimentation campaign. Contracting strategies vary based on the activities of each campaign.

NC3 Commercial Development/Prototyping will use full-and-open proposal calls under the existing Defense Experimentation Using the Commercial Space Internet (DEUCSI) solicitation. Terminals (radios, modems, antennas) will be prototypes using multiple prime vendors. The primes will be expected to establish sub-contracts with the commercial vendors to secure the modems or waveforms, so as to allow the government to operationalize this capability as an integrated unit. With awards to a qualified integration contractor for each platform, the prototype units will be integrated onto a single platform of each type, complete flight worthiness approvals, interim authorities to test (IATT), and complete flight testing in an operational environment to prove the system. Working with the PEO of each platform we will then be able to extend the capability to the rest of the fleet as a simple procurement of a proven prototype, using Firm Fixed Price contracts and enabling Rapid Acquisition Authorities if needed. The Satellite communication (SATCOM) service will be acquired through the terminal prototype contracts for a limited duration to support the experimentation (typically 1 year), and transition to service contracts under United States Space Force Chief of Space Commercial Satellite Communications Office for operations.

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
Prototyping	Various	Various : Various	-	-		2.404	Dec 2022	-		-		-	Continuing	Continuing	-
Prototyping Campaign Global Lightning Commercial Space Internet Contract 1	C/CPFF	Raytheon : McKinney, TX	-	5.500	Sep 2021	3.688	Feb 2022	-		-		-	Continuing	Continuing	-
Prototyping Campaign Global Lightning Commercial Space Internet Contract 2	C/CPFF	Various : Various	-	0.000	Mar 2021	-		-		-		-	Continuing	Continuing	-
Prototyping Campaign Global Lightning Commercial Space Internet Contract 3	C/CPFF	SpaceX : Hawthorne, CA	-	11.242	Oct 2021	7.936	Apr 2022	-		-		-	Continuing	Continuing	-
Prototyping Campaign Global Lightning Commercial Space Internet Contract 4	C/CPFF	Northrop Grumman : San Diego, CA	-	1.700	Jul 2021	7.822	May 2022	-		-		-	Continuing	Continuing	-
Prototyping Campaign Global Lightning Commercial Space Internet Contract 5	C/CPFF	L3 : Salt Lake City, UT	-	1.800	Jun 2021	2.015	Apr 2022	-		-		-	0.000	3.815	-
Prototyping Campaign Global Lightning Commercial Space Internet Contract 6	C/CPFF	Ball Aerospace : Boulder, CO	-	4.995	Mar 2021	-		-		-		-	Continuing	Continuing	-
Prototyping Campaign Global Lightning Commercial Space Internet Contract 7	C/CPFF	Hughes : Germantown, MD	-	2.426	May 2021	-		-		-		-	Continuing	Continuing	-
Prototyping Campaign Global Lightning Commercial Space Internet Contract 8	C/CPFF	Lockheed Martin : Fort Worth, TX	-	2.450	Mar 2021	8.369	Apr 2022	-		-		-	Continuing	Continuing	-
NC3 Commercial Development/Prototyping Terminal Contract	C/CPFF	Various : Various	-	-		-		70.000	Oct 2022	-		70.000	Continuing	Continuing	-

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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
NC3 Commercial Development/Prototyping Platform Integration	C/CPFF	Various : Various	-	-		-		43.000	Jan 2023	-		43.000	Continuing	Continuing	-
Prototyping Campaign Base Defense Contract 1	C/CPFF	BAE : Minneapolis, MN	-	5.315	Oct 2021	18.317	Mar 2022	-		-		-	Continuing	Continuing	-
Prototyping Campaign Hawkeye	C/CPFF	Space X : Hawthorne, CA	-	-		6.500	Apr 2022	-		-		-	Continuing	Continuing	-
Prototyping Campaign Hawkeye Contract 2	C/CPFF	Ball Aerospace : Boulder, CO	-	-		2.400	Apr 2022	-		-		-	Continuing	Continuing	-
Prototyping Campaign Autonomous Attritable Aircraft Contract 1	C/CPFF	CALSPAN : Buffalo, NY	-	-		2.300	Sep 2022	-		-		-	Continuing	Continuing	-
Prototyping Campaign Autonomous Attritable Aircraft Contract 2	C/CPFF	Various : Various	-	0.430	Dec 2021	9.300	Oct 2022	-		-		-	Continuing	Continuing	-
Prototyping Campaign Autonomous Attritable Aircraft Contract 3	C/CPFF	Lockheed : Various	-	-		1.000	Aug 2022	-		-		-	Continuing	Continuing	-
Prototyping Campaign Palletized Munitions (Rapid Dragon) Contract 1	C/CPFF	Lockheed Martin : Orlando, FL	-	22.283	Jul 2021	15.010	Apr 2022	10.000	Oct 2022	-		10.000	Continuing	Continuing	-
Prototyping Campaign Palletized Munitions (Rapid Dragon) Contract 2	C/Various	Various : Various	-	0.100	Nov 2021	-		-		-		-	Continuing	Continuing	-
Regional Operating Picture	C/FFP	Persistent Systems, LLC : New York, NY	-	-		18.500	Jan 2022	32.000	Mar 2023	-		32.000	Continuing	Continuing	-
Operational Energy Improvements Legacy Aircraft Drag Reductions	Various	Various : Various	-	-		-		42.500	Feb 2023	-		42.500	Continuing	Continuing	-
Energy Supply Chain Risk Model	Various	Various : Various	-	-		-		2.500	Jan 2023	-		2.500	Continuing	Continuing	-
C-17 Aft-Body Drag Reduction	Various	Various : Various	-	-		-		-		-		-	Continuing	Continuing	-
KC-135 Vertical Wipers	Various	Various : Various	-	-		-		-		-		-	Continuing	Continuing	-

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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
KC-135 Drag Reduction	Various	Various : Various	-	-		-		-		-		-	Continuing	Continuing	-
Mobility Air Forces Allocation/Long Range Planning	Various	Various : Various	-	-		-		6.000	Jan 2023	-		6.000	Continuing	Continuing	-
Puckboard Scheduling Engine	Various	Various : Various	-	-		-		6.000	Jan 2023	-		6.000	Continuing	Continuing	-
Cargo Optimization - Improved Load Planning	Various	Various : Various	-	-		-		1.000	Jan 2023	-		1.000	Continuing	Continuing	-
Mobility Air Forces Flight Control Surface Rigging	Various	Various : Various	-	-		-		-		-		-	Continuing	Continuing	-
Alt Position Navigation and Timing	Various	Various : Various	-	-		-		-		-		-	Continuing	Continuing	-
C-130 Aft-Body Drag Reduction	Various	Various : Various	-	-		-		-		-		-	Continuing	Continuing	-
C-17 Engine Pylon Fairings	Various	Various : Various	-	-		-		-		-		-	Continuing	Continuing	-
Congressional Add Solar Block Research	Various	Various : Various	-	4.818	Apr 2022	-		-		-		-	Continuing	Continuing	-
Congressional Add Logistics Technologies	Various	Various : Various	-	8.455	Dec 2021	-		-		-		-	0.000	8.455	-
Congressional Add Heavy Payload Solar Powered UAS JCTD	MIPR	Defense Innovation Unit : Mountain View, CA	-	14.494	Aug 2021	-		-		-		-	0.000	14.494	-
Commercial SATCOM prototyping Mission Analysis 3	C/CPFF	TBD/Multiple : TBD	-	-		-		-		-		-	Continuing	Continuing	-
Congressional Add Agility Prime	Various	Various : Various	-	24.121	Sep 2022	-		-		-		-	Continuing	Continuing	-
Congressional Add Artic Communications	Various	Various : Various	-	48.316		-		-		-		-	Continuing	Continuing	-
Congressional Add alternative PNT phase III demonstration	Various	Various : Various	-	-		4.000	Sep 2022	-		-		-	Continuing	Continuing	-

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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
Congressional Add Logistics Enhancements	Various	Various : Various	-	-		4.000	Sep 2022	-		-		-	Continuing	Continuing	-
		Subtotal	-	158.445		113.561		213.000		-		213.000	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
Prototyping Support	Various	Various : Various	-	-		5.549	Jul 2022	2.000	Nov 2022	-		2.000	Continuing	Continuing	-
Prototyping Campaign Global Lightning Commercial Space Internet Support 1	MIPR	BAH : Tysons Corner, VA	-	-		2.129	Feb 2022	-		-		-	0.000	2.129	-
Prototyping Campaign Global Lightning Commercial Space Internet Support 2	MIPR	DTIC : Ft Belvoir, VA	-	1.313	Jul 2021	-		-		-		-	Continuing	Continuing	-
Prototyping Campaign Global Lightning Commercial Space Internet Support 3	MIPR	Various : Various	-	-		1.000	Oct 2021	-		-		-	Continuing	Continuing	-
Prototyping Campaign FloatPlane MC130J Amphibious Capability Support 1	MIPR	Various : Various	-	1.625	Aug 2021	-		-		-		-	Continuing	Continuing	-
NC3 Commercial Development/Prototyping Mission Analysis Support 1	MIPR	RAND Corp : Santa Monica, CA	-	-		-		2.000	Nov 2022	-		2.000	Continuing	Continuing	-
NC3 Commercial Development/Prototyping Mission Analysis Support 2	MIPR	TBD : TBD	-	-		-		2.000	Dec 2022	-		2.000	Continuing	Continuing	-
Prototyping Campaign Base Defense Support 1	MIPR	JHU : Baltimore, MD	-	-		0.854	Jun 2022	-		-		-	Continuing	Continuing	-

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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
Prototyping Campaign Base Defense Support 2	MIPR	Army : Picatinny Arsenal, NJ	-	4.574	Jul 2021	-		-		-		-	Continuing	Continuing	-
Prototyping Campaign Base Defense Support 3	MIPR	Navy : Dahlgren, VA	-	3.744	Sep 2021	2.218	Mar 2022	-		-		-	Continuing	Continuing	-
Prototyping Campaign Hawkeye	MIPR	Eglin AFB : Destin, FL	-	-		0.530	Jul 2022	-		-		-	Continuing	Continuing	-
Prototyping Campaign Palletized Munitions (Rapid Dragon)	MIPR	Dahlgren Navy : Dahglren, VA	-	1.772	Sep 2021	1.750	Nov 2021	2.000	Nov 2022	-		2.000	Continuing	Continuing	-
Prototyping Campaign Palletized Munitions (Rapid Dragon) 2	MIPR	412 TW : Edwards AFB, CA	-	-		1.350		-		-		-	Continuing	Continuing	-
Prototyping Campaign Palletized Munitions Support	Various	Various : Various	-	-		6.639		-		-		-	Continuing	Continuing	-
Prototyping Campaign Autonomous Attritable Aircraft	Various	Various : Various	-	0.083	Nov 2021	1.925	Feb 2022	-		-		-	Continuing	Continuing	-
Prototyping Campaign Podded Position Navigation and Timing Prototyping	Various	Various : Various	-	-		0.466	Mar 2022	-		-		-	Continuing	Continuing	-
Regional Operating Picture	C/FFP	Persistent Systems, LLC : New York, NY	-	-		2.000	Apr 2022	5.500	Feb 2023	-		5.500	Continuing	Continuing	-
		Subtotal	-	13.111		26.410		13.500		-		13.500	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
Prototyping Test and Evaluation	Various	Various : Various	-	-		-		-		-		-	Continuing	Continuing	-
Prototyping Campaign Global Lightning	MIPR	Various : Various	-	0.805	Aug 2021	1.200	May 2022	-		-		-	0.000	2.005	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604858F / *Tech Transition Program*	Project (Number/Name) 645351 / *Prototyping*	

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
Commercial Space Internet															
Prototyping Campaign Palletized Munitions (Rapid Dragon)	MIPR	Various : Various	-	1.705	Nov 2021	3.300	May 2022	16.050	Jan 2023	-		16.050	Continuing	Continuing	-
Prototyping Campaign Navigation Technology Satellite 3	MIPR	Various : Various	-	1.300	Apr 2021	0.900	Feb 2022	-		-		-	Continuing	Continuing	-
Prototyping Campaign Base Defense	MIPR	Various : Various	-	-		2.610	Apr 2022	-		-		-	Continuing	Continuing	-
Prototyping Campaign Autonomous Attritable Aircraft	Various	Various : Various	-	2.040	Sep 2021	2.475	Apr 2022	-		-		-	Continuing	Continuing	-
Prototyping Campaign FloatPlane MC130J Amphibious Capability	MIPR	WHS : Washington, DC	-	1.075	May 2021	-		-		-		-	Continuing	Continuing	-
Prototyping Campaign Hawkeye	MIPR	Various : Various	-	-		0.570	Jun 2022	-		-		-	Continuing	Continuing	-
Regional Operating Picture	C/FFP	Persistent Systems LLC : New York, NY	-	-		1.500	May 2022	18.000	Jan 2023	-		18.000	Continuing	Continuing	-
Prototyping Campaign Podded Position Navigation and Timing Prototyping	Various	Various : Various	-	-		0.534	Mar 2022	-		-		-	Continuing	Continuing	-
		Subtotal	-	6.925		13.089		34.050		-		34.050	Continuing	Continuing	N/A

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
Prototyping Contractor Support	Various	Various : Various	-	0.070	Feb 2021	0.246	Mar 2022	0.133	Nov 2022	-		0.133	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604858F / *Tech Transition Program*	Project (Number/Name) 645351 / *Prototyping*	

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
Prototyping Program Management Administration Costs	Various	Various : Various	-	1.442	Feb 2021	2.889	Feb 2022	3.408	Jan 2023	-		3.408	Continuing	Continuing	-
		Subtotal	-	1.512		3.135		3.541		-		3.541	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	-	179.993		156.195		264.091		-		264.091	Continuing	Continuing	N/A

Remarks

Additional details can be provided in the appropriate forum.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 645351 / *Prototyping*

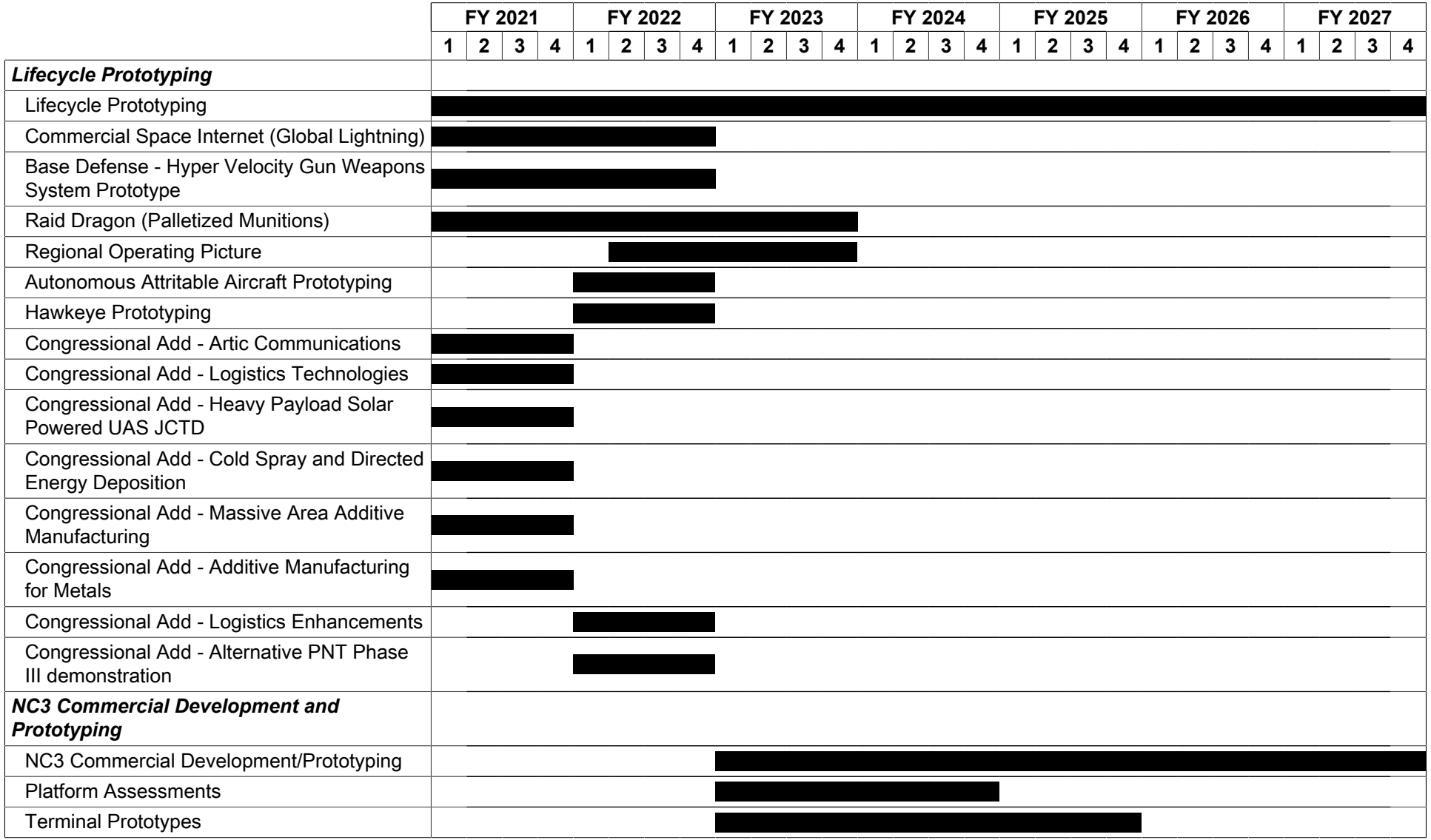

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 645351 / *Prototyping*

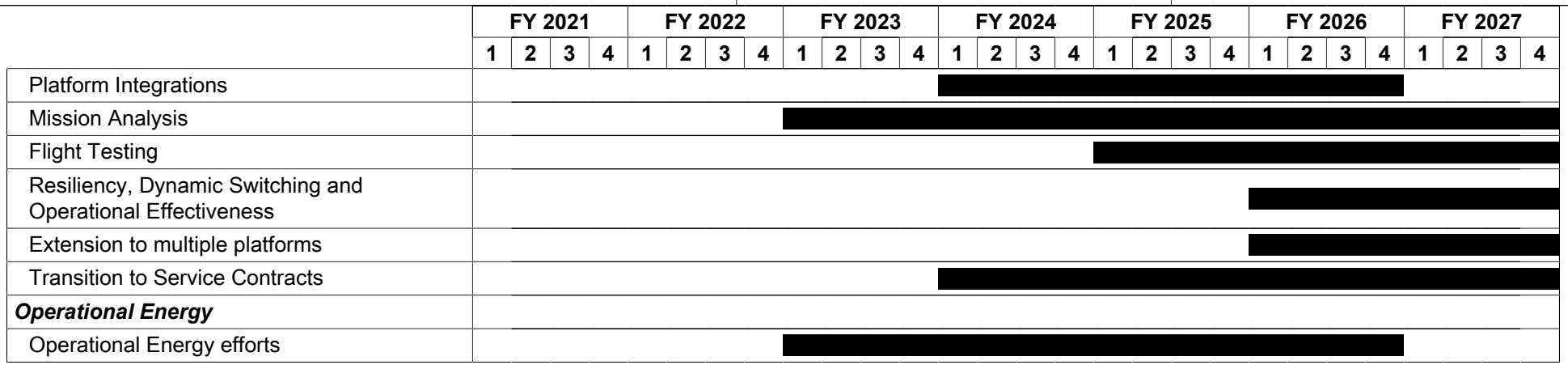

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 645351 / *Prototyping*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Lifecycle Prototyping				
Lifecycle Prototyping	1	2021	4	2027
Commercial Space Internet (Global Lightning)	1	2021	4	2022
Base Defense - Hyper Velocity Gun Weapons System Prototype	1	2021	4	2022
Raid Dragon (Palletized Munitions)	1	2021	4	2023
Regional Operating Picture	2	2022	4	2023
Autonomous Attritable Aircraft Prototyping	1	2022	4	2022
Hawkeye Prototyping	1	2022	4	2022
Congressional Add - Artic Communications	1	2021	4	2021
Congressional Add - Logistics Technologies	1	2021	4	2021
Congressional Add - Heavy Payload Solar Powered UAS JCTD	1	2021	4	2021
Congressional Add - Cold Spray and Directed Energy Deposition	1	2021	4	2021
Congressional Add - Massive Area Additive Manufacturing	1	2021	4	2021
Congressional Add - Additive Manufacturing for Metals	1	2021	4	2021
Congressional Add - Logistics Enhancements	1	2022	4	2022
Congressional Add - Alternative PNT Phase III demonstration	1	2022	4	2022
NC3 Commercial Development and Prototyping				
NC3 Commercial Development/Prototyping	1	2023	4	2027
Platform Assessments	1	2023	4	2024
Terminal Prototypes	1	2023	4	2025
Platform Integrations	1	2024	4	2026
Mission Analysis	1	2023	4	2027
Flight Testing	1	2025	4	2027

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 645351 / *Prototyping*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Resiliency, Dynamic Switching and Operational Effectiveness	1	2026	4	2027
Extension to multiple platforms	1	2026	4	2027
Transition to Service Contracts	1	2024	4	2027
Operational Energy				
Operational Energy efforts	1	2023	4	2026