Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Air Force											Date: March 2023	
Appropriation/Budget Activity 3620F: *Research, Development, Test & Evaluation, Space Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 1206458SF / *Tech Transition (Space)*							
COST ($ in Millions)	**Prior Years**	**FY 2022**	**FY 2023**	**FY 2024 Base**	**FY 2024 OCO**	**FY 2024 Total**	**FY 2025**	**FY 2026**	**FY 2027**	**FY 2028**	**Cost To Complete**	**Total Cost**
Total Program Element	-	50.000	0.000	164.649	0.000	164.649	228.147	301.881	219.654	156.327	Continuing	Continuing
649493: *Resilient Architecture Design and Evaluation*	-	0.000	0.000	15.067	0.000	15.067	60.035	82.743	199.200	156.327	Continuing	Continuing
64S444: *Experimentation (Space)*	-	50.000	0.000	149.582	0.000	149.582	168.112	219.138	20.454	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Tech Transition (Space) Program addresses the gap between initial system-level technology or concept development and demonstration, and successful acquisition and operational capability implementation. This program also matures new warfighting concepts to rapidly develop and experiment with fieldable prototypes to assess military utility of transition-ready weapon systems. Following the guidance in the National Defense Strategy, the Department of the Air Force has institutionalized Experimentation and Prototyping to achieve smarter, faster, and more efficient acquisitions that move technologies rapidly to support the most critical warfighting capabilities. Project 64S444, Experimentation (Space), explores new space-related 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 process and significantly reduce overall acquisitions costs. 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 was a Congressionally-directed new start in FY 2022. It is a parallel effort to United States Air Force Program Element (PE) 0604858F, Tech Transition Program, Project 645350, Experimentation, and continues space-related work executed in that Program in prior fiscal years.

By FY28, the Projects quantify the performance and resilience of a Hybrid SATCOM architecture in an operational environment by connecting flexible terminals (from multiple vendors) to multiple SATCOM paths spanning low, medium, and geosynchronous orbits. Each of these new SATCOM pathways offer unique attributes to the DOD. The terminal flexibility will allow rapid incorporation of new commercial SATCOM vendors as they emerge, thus ensuring low-cost SATCOM options for DOD in the foreseeable future. The Resilient Architecture Design and Evaluation project coupled with Hybrid SATCOM terminals will prototype and test techniques for dynamic networking, enhancing cybersecurity, and rapid switching capabilities between vendors, including developing a billing approach between vendors. The knowledge will transition to USSF to inform contract structures for operations that enable switching between multiple vendors at minimum cost. Together, these Projects will directly inform COCOMS, MAJCOMS, and PEOs in the acquisition and sustainment of Hybrid SATCOM capability for multiple Joint Force applications using commercial service level agreements and advanced cybersecurity architectures.

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,

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Air Force	Date: March 2023
Appropriation/Budget Activity 3620F: *Research, Development, Test & Evaluation, Space Force I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 1206458SF *I Tech Transition (Space)*

0606398F, 0605831F, and/or 0606017F. 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. This type of 6.4 effort has been shown effective to reduce both the time and cost of transitioning the new capabilities to operations.

This effort is in Budget Activity 4, Advanced Component Development and Prototypes (ACD&P), because efforts are necessary to evaluate integrated technologies, representative modes or prototype systems in a high fidelity and realistic operating environment.

B. Program Change Summary ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	50.000	0.000	0.000	0.000	0.000
Current President's Budget	50.000	0.000	164.649	0.000	164.649
Total Adjustments	0.000	0.000	164.649	0.000	164.649
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	164.649	0.000	164.649

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2022	FY 2023
Project: 64S444: *Experimentation (Space)*		
Congressional Add: *Program Increase - Arctic Communications*	50.000	-
Congressional Add Subtotals for Project: 64S444	50.000	-
Congressional Add Totals for all Projects	50.000	-

Change Summary Explanation

FY2024 funding increased compared to FY2023 by 164.649 million. Funding increased due to the addition of Hybrid SATCOM terminal efforts and architecture experimentation and the addition of resilient architecture design and evaluation program.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force			Date: March 2023
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206458SF / *Tech Transition (Space)*	Project (Number/Name) 649493 / *Resilient Architecture Design and Evaluation*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
649493: *Resilient Architecture Design and Evaluation*	-	0.000	0.000	15.067	0.000	15.067	60.035	82.743	199.200	156.327	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Resilient Architecture Design and Evaluation project conducts experimentation within an interconnected hybrid SATCOM architecture to validate the performance, scalability and resilience of providing the Joint Force with multiple separate communications paths. To achieve these resiliency gains, the hybrid network requires 1) on-demand management of multi-band, multi-orbit DoD, allied and commercial data links; and 2) management and control capabilities to orchestrate paths through the space and ground networks. The effort validates the "Resilience by Design" approach in the Space Warfighting Analysis Center (SWAC) Space Data Transport Force Design through a combination of 1) modeling and simulation; 2) hardware- and software-in-the-loop analysis; and 3) terrestrial and on-orbit simulation. The project leverages Hybrid SATCOM terminal prototyping in the Experimentation (Space) project along with direct relationships with commercial providers to demonstrate dynamic networking, understand commercial offerings, assess security and resiliency, and inform future acquisition approaches.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: Resilient Architecture Design and Evaluation	-	0.000	15.067
Description: Prototype and optimize a cyber-secure multi-orbit space-based data transport capability that is resilient by design, as a core element of the USSF Hybrid Space Architecture for enterprise capability. Through collaborative modeling and simulation, prototype software and hardware in the loop systems, and on-orbit operational experimentation, validate critical underlying assumptions of the USSF Future Force Design elements built upon the integration of allied and commercial SATCOM capabilities across decoupled paths. Prototype existing high-TRL capabilities into operational experiments to identify and resolve key unknowns regarding network topology management, data forwarding, quality of service, availability, security, and scalability. The product is mature architecture models that are validated with quantitative performance and scalability data suitable to develop USSF requirements and reduce risk to future acquisition.			
FY 2023 Plans: N/A			
FY 2024 Plans: Perform modeling/simulation and operational experimentation to validate performance, security and software-defined wide area networking data forwarding and routing paths. In collaboration with the Space Warfighting Analysis Center, USSF requirements, architecture and program offices, and other stakeholders, advance toward on-orbit demonstration of architectural elements			

Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 4	**R-1 Program Element (Number/Name)** PE 1206458SF / *Tech Transition (Space)*	**Project (Number/Name)** 649493 / *Resilient Architecture Design and Evaluation*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
assessed as low readiness or high risk to the future force design. Establish approaches to feed findings back into the Force Design and forward into acquisition. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** FY 2024 funding increased compared to FY2023 by 15.067 million. Funding increased due to the addition of architecture experimentation.			
Accomplishments/Planned Programs Subtotals	-	0.000	15.067

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The AFRL at Kirtland Air Force Base, New Mexico manages and executes Resilient Architecture Design and Evaluation effort following the existing internetworking experimentation acquisition strategy. Baseline modeling and simulation and hardware-/software-in-the-loop development and experimentation is primarily conducted by a Government team of FFRDCs and Service Laboratories to avoid vendor lock-in or reduced competition from industry. Prototyping agreements jointly executed with the Defense Innovation Unit provide access to accurate models of established commercial data transport capabilities as well as services under development, ensuring the technical vision for the future architecture is well-anchored in market realities. Competitive procurements of required hardware prototypes for terrestrial or space experimentation will occur through rapid prototyping and experimentation authorities. All funding vehicles are constructed to enable seamless transition to requirements, program development, and acquisition offices as appropriate to enable incremental fielding and avoid loss of momentum as the new architectures solidify. Access to the AFRL simulation environment is similarly available for further Government use.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Air Force			Date: March 2023
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206458SF / *Tech Transition (Space)*	Project (Number/Name) 649493 / *Resilient Architecture Design and Evaluation*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Resilient Architecture Design and Evaluation	Various	Various : Various : TBD	-	-		-		9.033	Oct 2023	-		9.033	Continuing	Continuing	-
		Subtotal	-	-		-		9.033		-		9.033	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Resilient Architecture Design and Evaluation	Various	Various: Various : TBD	-	-		-		4.033	Jan 2024	-		4.033	Continuing	Continuing	-
		Subtotal	-	-		-		4.033		-		4.033	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Administration	Various	Various: TBD : TBD	-	-		-		2.001		-		2.001	Continuing	Continuing	-
		Subtotal	-	-		-		2.001		-		2.001	Continuing	Continuing	N/A

	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		-		15.067		-		15.067	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 4	**R-1 Program Element (Number/Name)** PE 1206458SF / *Tech Transition (Space)*	**Project (Number/Name)** 649493 / *Resilient Architecture Design and Evaluation*

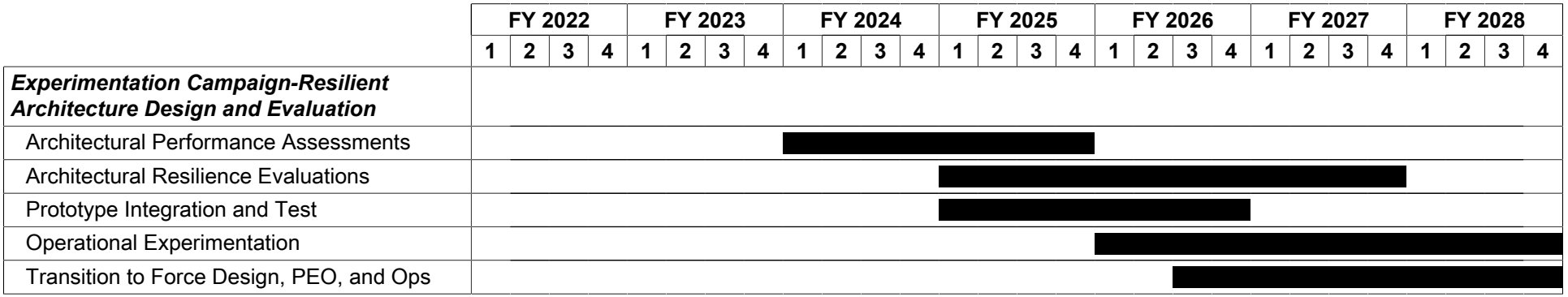

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 4	**R-1 Program Element (Number/Name)** PE 1206458SF / *Tech Transition (Space)*	**Project (Number/Name)** 649493 / *Resilient Architecture Design and Evaluation*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Experimentation Campaign-Resilient Architecture Design and Evaluation				
Architectural Performance Assessments	1	2024	4	2025
Architectural Resilience Evaluations	1	2025	4	2027
Prototype Integration and Test	1	2025	4	2026
Operational Experimentation	1	2026	4	2028
Transition to Force Design, PEO, and Ops	3	2026	4	2028

Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force			Date: March 2023
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206458SF / *Tech Transition (Space)*	Project (Number/Name) 64S444 / *Experimentation (Space)*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
64S444: *Experimentation (Space)*	-	50.000	0.000	149.582	0.000	149.582	168.112	219.138	20.454	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Experimentation (Space), Project 64S444, efforts conduct experimentation and field prototyping of Hybrid Satellite Communications (SATCOM) for Joint operational implementation. In FY22, this included experimentation for Arctic Communications, leveraging Air Force Research Laboratory (AFRL) Global Lightning efforts. In FY24 through FY28, the Experimentation (Space) efforts will extend Hybrid SATCOM capabilities to an expanded set of DOD platforms, and enable assured communications through both commercial and military satellite constellations in multiple orbital regimes, while accessing multiple frequency bands to maintain resilient connectivity and security. The Hybrid SATCOM terminal effort implements and experimentally flight tests multi-band, multi-constellation, multi-orbit SATCOM terminals at three ground installations and on nine different aircraft types. Specific platforms and platform details are available through proper channels. The Project also demonstrates the ability of Hybrid SATCOM terminals to seamlessly switch between vendors and satellite constellations. The Hybrid SATCOM terminal prototyping will include secure connectivity using National Security Agency-approved approaches, and authority approvals at least to the interim levels needed for experimentation as required for DOD communications.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024
Title: Experimentation Space	-	0.000	149.582
Description: Experimentation Space addresses significant gaps identified by COCOMs, MAJCOMs, and Department Air Force (DAF) Senior Leaders, often by quickly leveraging emerging capability into DOD systems. ***FY 2023 Plans:*** N/A ***FY 2024 Plans:*** Develop first prototypes for the Hybrid SATCOM Terminals that can be integrated on air and ground platforms, and perform the required integration assessments on 5 of the 9 platforms. ***FY 2023 to FY 2024 Increase/Decrease Statement:*** FY2024 funding increased compared to FY2023 by 169.4 million. Funding increased due to the addition of Hybrid SATCOM efforts.			
Accomplishments/Planned Programs Subtotals	-	0.000	149.582

	FY 2022	FY 2023
Congressional Add: Program Increase - Arctic Communications	50.000	-

Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 4	**R-1 Program Element (Number/Name)** PE 1206458SF / *Tech Transition (Space)*	**Project (Number/Name)** 64S444 / *Experimentation (Space)*

	FY 2022	FY 2023
FY 2022 Accomplishments: Conduct Congressionally directed effort.		
Congressional Adds Subtotals	50.000	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Air Force Research Lab (AFRL) at Wright-Patterson Air Force Base, Ohio manages and executes Experimentation (Space) efforts. The contracting approach includes full-and-open competition using the existing Defense Experimentation Using the Commercial Space Internet (DEUCSI) Acquisition Strategy. The effort will be executed using a combination of existing contracts and new contracts to be issued under the DEUCSI solicitation.

The Prime Contractors will be expected to establish sub-contracts with multiple commercial vendors to secure access to a wide range of technology options, 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 operational worthiness approvals, interim authorities to test (IATT), and test in an operational environment to validate the design. For commercial SATCOM applications, the service will be acquired through the terminal prototype contracts for a limited duration to support the experimentation (typically 1 year).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Air Force			Date: March 2023
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206458SF / *Tech Transition (Space)*	Project (Number/Name) 64S444 / *Experimentation (Space)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Congressional Add Arctic Comm terminals	Various	Various : Various	-	40.000	Jul 2022	-		-		-		-	Continuing	Continuing	-
Hybrid SATCOM Terminals Contractor 1	Various	Various : Various	-	-		-		61.942	Oct 2023	-		61.942	Continuing	Continuing	-
Hybrid SATCOM Terminals Contractor 2	Various	Various : Various	-	-		-		38.377	Nov 2023	-		38.377	Continuing	Continuing	-
Hybrid SATCOM Terminals Contractor 3	Various	Various : Various	-	-		-		28.255	Oct 2023	-		28.255	Continuing	Continuing	-
		Subtotal	-	40.000		-		128.574		-		128.574	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Congressional Add Arctic Comm Test and Evaluation	Various	Various : Various	-	10.000	Dec 2022	-		-		-		-	Continuing	Continuing	-
Hybrid SATCOM Terminals	Various	Various : Various	-	-		-		18.055	Jan 2024	-		18.055	Continuing	Continuing	-
		Subtotal	-	10.000		-		18.055		-		18.055	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Administration	Various	Various : TBD	-	-		-		2.953	Nov 2023	-		2.953	Continuing	Continuing	-
		Subtotal	-	-		-		2.953		-		2.953	Continuing	Continuing	N/A

	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	50.000		-		149.582		-		149.582	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Air Force			Date: March 2023
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206458SF / *Tech Transition (Space)*	Project (Number/Name) 64S444 / *Experimentation (Space)*	

	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 4	**R-1 Program Element (Number/Name)** PE 1206458SF / *Tech Transition (Space)*	**Project (Number/Name)** 64S444 / *Experimentation (Space)*

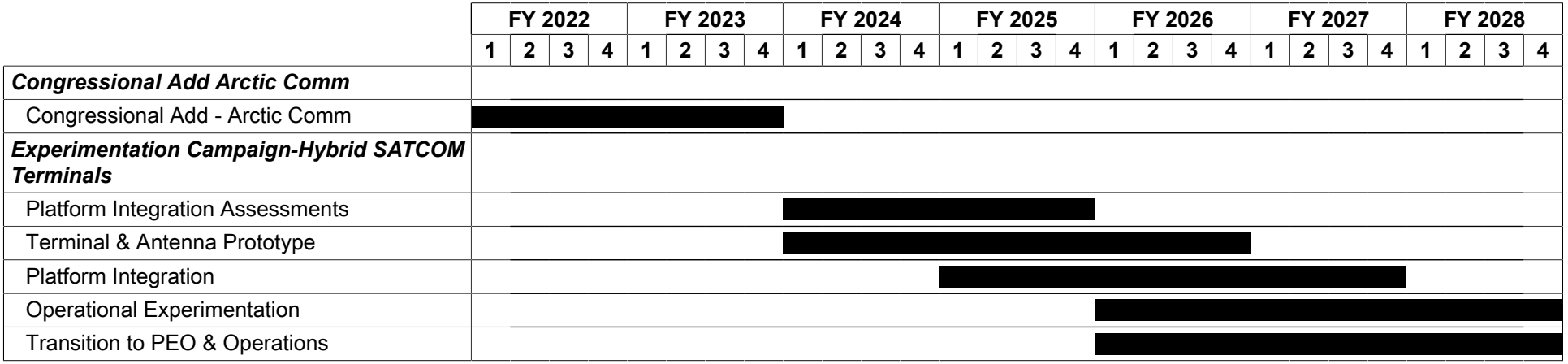

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3620F / 4	**R-1 Program Element (Number/Name)** PE 1206458SF / *Tech Transition (Space)*	**Project (Number/Name)** 64S444 / *Experimentation (Space)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Congressional Add Arctic Comm				
Congressional Add - Arctic Comm	1	2022	4	2023
Experimentation Campaign-Hybrid SATCOM Terminals				
Platform Integration Assessments	1	2024	4	2025
Terminal & Antenna Prototype	1	2024	4	2026
Platform Integration	1	2025	4	2027
Operational Experimentation	1	2026	4	2028
Transition to PEO & Operations	1	2026	4	2028