Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Air Force											Date: May 2021	
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 1206855F / *Evolved Strategic SATCOM (ESS)*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	-	161.882	0.000	0.000	0.000	0.000	-	-	-	-	-	-
643725: *Evolved Strategic SATCOM (ESS)*	-	161.882	0.000	0.000	0.000	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In FY 2021, PE 1206855F, Evolved Strategic SATCOM (ESS) efforts were transferred to Appropriation 3620, Research, Development, Test & Evaluation, Space Force, PE 1206855SF, Evolved Strategic SATCOM (ESS) from Appropriation 3600, Budget Activity 04 due to creation of a new Appropriation for Space Force.

The ESS system continues the strategic SATCOM mission of the Advanced Extremely High Frequency (AEHF) program by providing space and mission control segments for worldwide and arctic DoD strategic, secure, jam-resistant, survivable communications for ground, sea, and air assets. ESS will meet the requirements for strategic communications and capability gaps identified in the Protected Satellite Communications Services (PSCS) Analysis of Alternatives (AoA), the Protected Follow-on for Resiliency (PAFR) Study and the Strategic Tiger Team. The ESS architecture and functionality will be designed in accordance with the United States Strategic Command's signed ESS Concept of Operations and the Joint Requirements Oversight Council's validated Capability Development Document (CDD) satisfying the legacy AEHF strategic requirements and mission performance with enhancements for increased resiliency and cybersecurity.

ESS will support strategic mission requirements to provide the National Command Authority (NCA) and Combatant Commanders with highly-reliable, secure Military Satellite Communications. ESS will support the forecasted strategic demand in all operational environments and will be compatible with the existing architectures. The ESS system will satisfy emerging requirements using modular open system approaches to support incremental enhancements.

For more rapid and resilient strategic capability risk reduction, the ESS Program Office is executing its approved Space Segment acquisition strategy that leverages Middle Tier Acquisition authorities from the National Defense Authorization Act of 2016 for rapid prototyping, while maintaining the continuity of the AEHF strategic mission that interfaces operationally within the existing architecture.

Activities for the ESS ground segment acquisition includes evolving and enhancing existing ground segment, space-to-ground segment integration, and modernization in support of Enterprise Ground Services compatibility, in accordance with the acquisition strategies and schedules.

Space acquisition must respond with speed and agility to emerging adversary threats. Space & Missile Systems Center (SMC) has transformed the organization and implementation of space acquisition to an enterprise approach, maximizing innovation and resiliency, leveraging international, commercial, and mission partnerships, and managing program/project priorities according to an integrated unclassified/classified enterprise space architecture. Expanding the appropriate acquisition authorities and contract mechanisms to deliver capability sooner, SMC will strategically execute experimentation, prototyping, risk reduction, and other efforts to develop new or repurpose capabilities.

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

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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	167.206	0.000	0.000	0.000	0.000
Current President's Budget	161.882	0.000	0.000	0.000	0.000
Total Adjustments	-5.324	0.000	0.000	0.000	0.000
• 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	-5.324	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

C. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Technical Baseline and Architectural Engineering	0.000	0.000	0.000
Description: The PSCS AoA, PAFR study, and Space Enterprise Vision study further defined the need for a more resilient, protected space architecture. ESS will support the strategic demand in all operational environments. Develop the technical baseline and conduct architectural engineering. Protected Tactical Waveform accommodation is not included in the current ESS CDD. ***FY 2021 Plans:*** N/A ***FY 2022 Plans:*** N/A			
Title: Acquisition Strategy and Space Segment Prototyping Preparation Activities	4.024	0.000	0.000
Description: In accordance with concept and architecture studies, ESS is conducting market research and working with Air Force Space Command (AFSPC) to define system requirements in support of acquisition strategy development. Increase in program			

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
office support for developing documentation and planning for activities leading up to and including a draft and final Request for Proposal (RFP) release and source selection. Finalize space segment acquisition activities for rapid, competitive prototyping with capability demonstration for up to three contractors leading up to, but not including, contract awards. ***FY 2021 Plans:*** N/A ***FY 2022 Plans:*** N/A			
Title: Space Segment Prototyping ***Description:*** Award up to three competitive rapid-prototyping contracts. Invest in technology and demonstrations that enables continued development of modernized, strategic payload and other key technology prototypes, risk reduction, and space segment design. Enables long-term return on investment and energizes industrial base for Strategic SATCOM, increased competition, promotion of innovation, and increased resiliency. Actively manage contractors through prototyping, demonstration and requirements/criteria needed for contractors to competitively bid on the ESS space segment Build, Integration and Test (I&T) and Delivery follow-on. ***FY 2021 Plans:*** N/A ***FY 2022 Plans:*** N/A	137.844	0.000	0.000
Title: ESS Ground Segment and Space-to-Ground Integration ***Description:*** Develop and field the ESS ground segment, to include Mission Planning, Command and Control and other architecture and activities required to support the ESS space segment. Includes interoperability with the existing architectures and interfaces for EGS compatibility. Provide for space-to-ground (system) and mission integration for the ESS system. ***FY 2021 Plans:*** N/A ***FY 2022 Plans:*** N/A	20.014	0.000	0.000
Accomplishments/Planned Programs Subtotals	161.882	0.000	0.000

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D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

The Milestone Decision Authority (MDA) designated ESS Space Segment as an FY 2016 National Defense Authorization Act Middle Tier Acquisition (Rapid Prototyping) activity and approved the ESS acquisition strategy on 14 December 2018. A rapid prototyping phase effectively replaces the Technology Maturation and Risk Reduction phase from a traditional acquisition under Department of Defense 5000 series Directives and Instructions. This approach will award up to three contracts in FY2020 to focus on reducing space segment risks with the objective of maximizing ESS demonstrated capability for the payload and other key technologies. An ESS Program Office-led RFP and source selection will determine which space prototyping contractor, via their performance during the rapid prototyping phase, is positioned for the space segment Build, I&T and Delivery follow-on. The space prototyping contractors will be carried through the follow-on (Build, I&T and Delivery) source selection to continue momentum until the follow-on contract is awarded.

Return on investment from space prototyping will energize the industrial base and increase competition in strategic SATCOM; inject innovative technical, process and integration approaches; burn down risk early and identify/correct issues as early as possible; and decrease traditional fielding timelines to support a more resilient and responsive architecture against emerging threats. Success in the competitive rapid-prototyping determines and informs follow-on Build, I&T and Delivery.

The initial Ground Segment Acquisition Strategy was approved by the Program Executive Officer (PEO) in 4th Quarter FY 2019 to begin early technology readiness studies for ESS Phase 1 Mission Planning in FY 2020. Final approval for Mission Planning to begin architectural design and development/production may require additional approval and authority designation by the MDA. In-Band and Out-of-Band Command and Control studies are underway to best evolve these systems that are currently under sustainment.

A Space Segment Payload ECU acquisition strategy will be delivered to the PEO for approval in FY 2021.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 1206855F / *Evolved Strategic SATCOM (ESS)*	**Project (Number/Name)** 643725 / *Evolved Strategic SATCOM (ESS)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Space Segment Prototyping	C/FFP	Various : Various	-	110.613	Sep 2020	-		-		-		-	-	-	-
Ground Segment and Space-to-Ground Integration	C/FFP	Various : Various	-	18.939	Nov 2019	-		-		-		-	-	-	-
Technical Mission Analysis	MIPR	Aerospace : El Segundo, CA	-	7.134	Nov 2019	-		-		-		-	-	-	-
Enterprise SE&I	C/CPAF	Linquest : Los Angeles, CA	-	9.468	Nov 2019	-		-		-		-	-	-	-
		Subtotal	-	146.154		-		-		-		-	-	-	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FFRDC	Various	Various : Various	-	4.533	Nov 2019	-		-		-		-	-	-	-
Other Support	Various	Various : Various	-	0.150	Oct 2019	-		-		-		-	-	-	-
A&AS	Various	Various : Various	-	11.045	Nov 2019	-		-		-		-	-	-	-
		Subtotal	-	15.728		-		-		-		-	-	-	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	161.882		0.000		-		-		-	-	-	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 1206855F / *Evolved Strategic SATCOM (ESS)*	**Project (Number/Name)** 643725 / *Evolved Strategic SATCOM (ESS)*

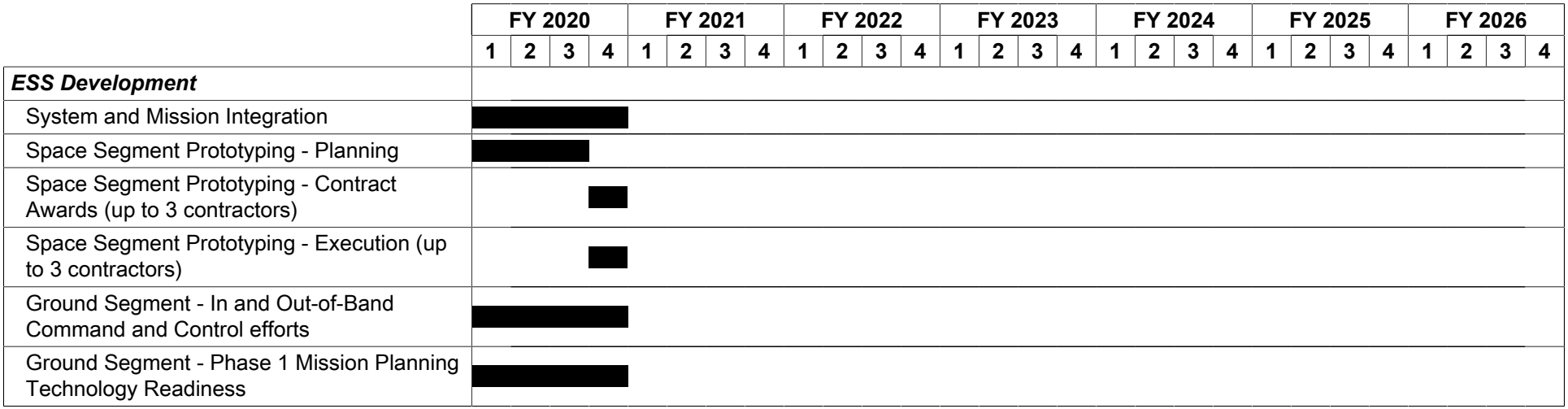

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 1206855F / *Evolved Strategic SATCOM (ESS)*	**Project (Number/Name)** 643725 / *Evolved Strategic SATCOM (ESS)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ESS Development				
System and Mission Integration	1	2020	4	2020
Space Segment Prototyping - Planning	1	2020	3	2020
Space Segment Prototyping - Contract Awards (up to 3 contractors)	4	2020	4	2020
Space Segment Prototyping - Execution (up to 3 contractors)	4	2020	4	2020
Ground Segment - In and Out-of-Band Command and Control efforts	1	2020	4	2020
Ground Segment - Phase 1 Mission Planning Technology Readiness	1	2020	4	2020