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**Department of Defense
Fiscal Year (FY) 2025 Budget Estimates**

March 2024



Air Force

Justification Book Volume 1 of 1

Research, Development, Test & Evaluation, Space Force

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Air Force • Budget Estimates FY 2025 • RDT&E Program

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Fiscal Year (FY) 2025 President's Budget RDT&E Descriptive Summaries Budget Activities March 2024

INTRODUCTION AND EXPLANATION OF CONTENTS

GENERAL

- This document has been prepared to provide information on the United States Space Force (USSF) Research, Development, Test and Evaluation (RDT&E) program elements and projects in the President's Budget (PB).
 - All exhibits in this document have been assembled in accordance with DoD 7000.14R, Financial Management Regulation, Volume 2B, Chapter 5.
 - Other comments on exhibit contents in this document:
 - Exhibits R-2/2a and R-3 provide narrative information for all RDT&E program elements and projects within the USSF FY 2025 RDT&E program with the exception of classified program elements. The format and contents of this document are in accordance to the guidelines and requirements of the Congressional committees in so far as possible.
 - The “Other Program Funding Summary” portion of the R-2 includes, in addition to RDT&E funds, Procurement funds and quantities, Military Construction appropriation funds on specific development programs, Operations and Maintenance appropriation funds where they are essential to the development effort described, and where appropriate, Department of Energy (DOE) costs.

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- All exhibits contained in Volume I are unclassified. Classified exhibits are not included in the submission due to the level of security classification and necessity of special security clearances.

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 Exhibit R-1 FY 2025 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

Mar 2024

	FY 2023 Actuals	FY 2024 PB Request with CR Adjustments*	FY 2025 Request
<u>Summary Recap of Budget Activities</u>			
Basic Research	53,261		36,080
Applied Research	369,504	206,196	244,964
Advanced Technology Development	589,065	582,526	563,436
Advanced Component Development & Prototypes	2,904,446	4,229,146	4,550,946
System Development & Demonstration	5,446,955	6,008,017	5,651,359
Management Support	959,327	563,021	567,369
Operational Systems Development	6,481,698	7,488,108	6,928,734
Software And Digital Technology Pilot Programs	191,980	122,326	157,265
Undistributed		-2,583,377	
Total Research, Development, Test, & Evaluation	16,996,236	16,615,963	18,700,153
<u>Summary Recap of FYDP Programs</u>			
Research and Development	54,077	849	36,947
Administration and Associated Activities	1,747	-2,583,377	
Space	11,446,152	13,433,824	13,142,883
Classified Programs	5,494,260	5,764,667	5,520,323
Total Research, Development, Test, & Evaluation	16,996,236	16,615,963	18,700,153

*A full-year FY 2024 appropriation for this account was not enacted at the time the budget was prepared; account is operating under the Further Additional Continuing Appropriations and Other Extensions Act, 2024 (Public Law 118-35). The amounts included for FY 2024 reflect the annualized level provided by the continuing resolution.

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Appropriation: 3620F Research, Development, Test, and Evaluation, Space Force

Line No	Program Element Number	Item	Act	Sec	FY 2023	FY 2024 PB	FY 2025
					Actuals	Request with CR Adjustments ⁺	Request
1	0601102SF	Defense Research Sciences	01	U	24,359		21,349
2	0601103SF	University Research Initiatives	01	U	28,902		14,731
	Basic Research				53,261		36,080
3	1202212SF	Defense Laboratories R&D Projects	02	U	14,330		
4	1206601SF	Space Technology	02	U	355,174	206,196	244,964
	Applied Research				369,504	206,196	244,964
5	1206310SF	Space Science and Technology Research and Development	03	U	431,411	472,493	425,166
6	1206616SF	Space Advanced Technology Development/Demo	03	U	157,654	110,033	138,270
	Advanced Technology Development				589,065	582,526	563,436
7	0604002SF	Space Force Weather Services Research	04	U	816	849	867
8	1203010SF	Space Force IT, Data Analytics, Digital Solutions	04	U		61,723	88,610
9	1203164SF	NAVSTAR Global Positioning System (User Equipment) (SPACE)	04	U	370,354	353,807	300,025
10	1203622SF	Space Warfighting Analysis	04	U	42,300	95,541	121,409
11	1203710SF	EO/IR Weather Systems	04	U	87,195	95,615	76,391
12	1203955SF	Space Access, Mobility & Logistics (SAML)	04	U			20,000
13	1206410SF	Space Technology Development and Prototyping	04	U	979,364	2,081,307	1,701,685
14	1206425SF	Space Situation Awareness Systems	04	U	213,884		
15	1206427SF	Space Systems Prototype Transitions (SSPT)	04	U	203,679	145,948	133,739

*A full-year FY 2024 appropriation for this account was not enacted at the time the budget was prepared; account is operating under the Further Additional Continuing Appropriations and Other Extensions Act, 2024 (Public Law 118-35). The amounts included for FY 2024 reflect the annualized level provided by the continuing resolution.

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Line No	Program Element Number	Item	Act	Sec	FY 2023	FY 2024 PB	FY 2025
					Actuals	Request with CR Adjustments ⁺	Request
16	1206438SF	Space Control Technology	04	U	48,560	58,374	62,195
17	1206458SF	Tech Transition (Space)	04	U		164,649	228,547
18	1206730SF	Space Security and Defense Program	04	U	69,169	59,784	53,199
19	1206760SF	Protected Tactical Enterprise Service (PTES)	04	U	106,895	76,554	79,709
20	1206761SF	Protected Tactical Service (PTS)	04	U	238,414	360,126	596,996
21	1206855SF	Evolved Strategic SATCOM (ESS)	04	U	491,530	632,833	1,046,161
22	1206857SF	Space Rapid Capabilities Office	04	U	52,286	12,036	11,361
23	1206862SF	Tactically Responsive Space	04	U		30,000	30,052
Advanced Component Development & Prototypes					2,904,446	4,229,146	4,550,946
24	1203269SF	GPS III Follow-On (GPS IIIF)	05	U	278,758	308,999	244,752
25	1203940SF	Space Situation Awareness Operations	05	U	55,517		
26	1206421SF	Counterspace Systems	05	U	32,683	36,537	37,078
27	1206422SF	Weather System Follow-on	05	U	47,110	79,727	49,207
28	1206425SF	Space Situation Awareness Systems	05	U	93,914	372,827	483,605
29	1206431SF	Advanced EHF MILSATCOM (SPACE)	05	U	11,419	4,068	1,020
30	1206432SF	Polar MILSATCOM (SPACE)	05	U	65,028	73,757	
31	1206433SF	Wideband Global SATCOM (SPACE)	05	U	46,618	49,445	
32	1206440SF	Next-Gen OPIR -- Ground	05	U	582,529	661,367	558,013
33	1206442SF	Next Generation OPIR	05	U	251,601	222,178	202,951
34	1206443SF	Next-Gen OPIR -- GEO	05	U	1,694,933	719,731	510,806

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Line No	Program Element Number	Item	Act	Sec	FY 2023	FY 2024 PB	FY 2025
					Actuals	Request with CR Adjustments ⁺	Request
35	1206444SF	Next-Gen OPIR -- Polar	05	U	849,196	1,013,478	828,878
36	1206445SF	Commercial SATCOM (COMSATCOM) Integration	05	U	18,361	73,501	134,487
37	1206446SF	Resilient Missile Warning Missile Tracking - Low Earth Orbit (LEO)	05	U	786,340	1,266,437	1,730,821
38	1206447SF	Resilient Missile Warning Missile Tracking - Medium Earth Orbit (MEO)	05	U	408,527	538,208	846,349
39	1206448SF	Resilient Missile Warning Missile Tracking - Integrated Ground Segment	05	U		505,569	
40	1206853SF	National Security Space Launch Program (SPACE) - EMD	05	U	224,421	82,188	23,392
System Development & Demonstration					5,446,955	6,008,017	5,651,359
41	0909980SF	Judgment Fund Reimbursement	06	U	1,744		
42	0909999SF	Financing for Cancelled Account Adjustments	06	U	3		
43	1203622SF	Space Warfighting Analysis	06	U		3,568	
44	1205502SF	Small Business Innovation Research	06	U	394,285		
45	1206116SF	Space Test and Training Range Development	06	U	18,726		
46	1206392SF	ACQ Workforce - Space & Missile Systems	06	U	253,716	258,969	274,424
47	1206398SF	Space & Missile Systems Center - MHA	06	U	13,962	13,694	12,867
48	1206601SF	Space Technology	06	U		91,778	
49	1206759SF	Major T&E Investment - Space	06	U	167,901	146,797	229,665
50	1206860SF	Rocket Systems Launch Program (SPACE)	06	U	33,643	18,023	20,134
51	1206862SF	Tactically Responsive Space	06	U	48,243		

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Line No	Program Element Number	Item	Act	Sec	FY 2023	FY 2024 PB	FY 2025
					Actuals	Request with CR Adjustments ⁺	Request
52	1206864SF	Space Test Program (STP)	06	U	27,104	30,192	30,279
		Management Support			959,327	563,021	567,369
54	1201017SF	Global Sensor Integrated on Network (GSIN)	07	U	5,321		
55	1203001SF	Family of Advanced BLoS Terminals (FAB-T)	07	U	124,394	91,369	2,607
56	1203040SF	DCO-Space	07	U	27,235	76,003	104,088
57	1203109SF	Narrowband Satellite Communications	07	U	103,855	230,785	228,435
58	1203110SF	Satellite Control Network (SPACE)	07	U	38,289	86,465	98,572
59	1203154SF	Long Range Kill Chains NAVSTAR Global Positioning System (Space and Control	07	U		243,036	244,121
60	1203165SF	Segments)	07	U	1,062		
61	1203173SF	Space and Missile Test and Evaluation Center Space Innovation, Integration and Rapid Technology	07	U	4,028	22,039	20,844
62	1203174SF	Development	07	U	48,166	41,483	48,900
63	1203182SF	Spacelift Range System (SPACE)	07	U	11,219	11,175	55,906
64	1203265SF	GPS III Space Segment	07	U	1,467		
65	1203330SF	Space Superiority ISR	07	U	29,128	28,730	28,227
66	1203620SF	National Space Defense Center	07	U	2,659		
67	1203873SF	Ballistic Missile Defense Radars	07	U	23,194	20,752	12,024
68	1203906SF	NCMC - TW/AA System	07	U	7,034	25,545	25,656
69	1203913SF	NUDET Detection System (SPACE)	07	U	60,429	93,391	83,426
70	1203940SF	Space Situation Awareness Operations	07	U	102,019	264,966	120,160

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					Actuals	Request with CR Adjustments ⁺	Request
71	1206423SF	Global Positioning System III - Operational Control Segment	07	U	267,791	317,309	217,224
75	1206770SF	Enterprise Ground Services	07	U	130,148	155,825	111,284
76	1208053SF	Joint Tactical Ground System	07	U		14,568	6,937
999	999999999	Classified Programs	07	U	5,494,260	5,764,667	5,520,323
	Operational Systems Development				6,481,698	7,488,108	6,928,734
77	1208248SF	Space Domain Awareness/Planning/Tasking SW	08	U	191,980	122,326	157,265
	Software And Digital Technology Pilot Programs				191,980	122,326	157,265
78	0901560SF	Continuing Resolution Programs	20	U		-2,583,377	
	Undistributed					-2,583,377	
Total Research, Development, Test, and Evaluation, Space Force					16,996,236	16,615,963	18,700,153

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12	04	1203955SF	Space Access, Mobility & Logistics (SAML).....	Volume 1 - 121
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Department of the Air Force
 FY 2025 President's Budget
 Exhibit R-1 FY 2025 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

Mar 2024

	FY 2023 Actuals	FY 2024 PB Request with CR Adjustments*	FY 2025 Request
<u>Summary Recap of Budget Activities</u>			
Basic Research	53,261		36,080
Applied Research	369,504	206,196	244,964
Advanced Technology Development	589,065	582,526	563,436
Advanced Component Development & Prototypes	2,904,446	4,229,146	4,550,946
System Development & Demonstration	5,446,955	6,008,017	5,651,359
Management Support	959,327	563,021	567,369
Operational Systems Development	6,481,698	7,488,108	6,928,734
Software And Digital Technology Pilot Programs	191,980	122,326	157,265
Undistributed		-2,583,377	
Total Research, Development, Test, & Evaluation	16,996,236	16,615,963	18,700,153
<u>Summary Recap of FYDP Programs</u>			
Research and Development	54,077	849	36,947
Administration and Associated Activities	1,747	-2,583,377	
Space	11,446,152	13,433,824	13,142,883
Classified Programs	5,494,260	5,764,667	5,520,323
Total Research, Development, Test, & Evaluation	16,996,236	16,615,963	18,700,153

*A full-year FY 2024 appropriation for this account was not enacted at the time the budget was prepared; account is operating under the Further Additional Continuing Appropriations and Other Extensions Act, 2024 (Public Law 118-35). The amounts included for FY 2024 reflect the annualized level provided by the continuing resolution.

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Department of the Air Force
 TOTAL CIVILIAN PERSONNEL COSTS
 OP-8B: OP-8 (PB)
 FY 2025 President's Budget Submission
 (FY 2023)

	(S in Thousands)											d/c l Basic Comp	i/c m Total Comp	Rates k/c n Comp & Benefits	h/d o % BC Variables	j/d p % BC Benefits
	a Begin Strength	b End Strength	c FTEs	d Basic Comp	e Overtime Pay	f Holiday Pay	g Other O.C.11	e + f + g h Total Variables	d + h i Comp O.C.11	i Benefits O.C.12/13	i + j k Comp & Benefits					
Direct Funded Personnel (includes OC 13)	2,158	1,956	1,891	322,889	0	0	0	0	322,889	0	322,889	\$170,750	\$170,750	\$170,750	0.0%	0.0%
D1. US Direct Hire (USDH)	2,158	1,956	1,891	322,889	-	-	-	-	322,889	-	322,889	\$170,750	\$170,750	\$170,750	0.0%	0.0%
D1a. Senior Executive Schedule	-	6	6	954	-	-	-	-	954	-	954	\$159,000	\$159,000	\$159,000	0.0%	0.0%
D1b. General Schedule	2,158	1,950	1,885	321,935	-	-	-	-	321,935	-	321,935	\$170,788	\$170,788	\$170,788	0.0%	0.0%
D1c. Special Schedule	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D1d. Wage System	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D1e. Highly Qualified Experts	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D1f. Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D2. Direct Hire Program Foreign Nationals (DHFN)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D3. Total Direct Hire	2,158	1,956	1,891	322,889	-	-	-	-	322,889	-	322,889	\$170,750	\$170,750	\$170,750	0.0%	0.0%
D4. Indirect Hire Foreign Nationals (IHFN)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal - Direct Funded (excludes OC 13)	2,158	1,956	1,891	322,889	-	-	-	-	322,889	-	322,889	\$170,750	\$170,750	\$170,750	0.0%	0.0%
D5. Other Object Class 13 Benefits	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D5a. USDH - Benefits for Former Employees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D5b. DHFN - Benefits for Former Employees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D5c. Voluntary Separation Incentive Pay (VSIP)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D5d. Foreign National Separation Liability Accrual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reimbursable Funded Personnel (includes OC 13)	37	84	83	8,877	0	0	0	0	8,877	0	8,877	\$106,952	\$106,952	\$106,952	0.0%	0.0%
R1. US Direct Hire (USDH)	37	84	83	8,877	-	-	-	-	8,877	-	8,877	\$106,952	\$106,952	\$106,952	0.0%	0.0%
R1a. Senior Executive Schedule	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R1b. General Schedule	37	84	83	8,877	-	-	-	-	8,877	-	8,877	\$106,952	\$106,952	\$106,952	0.0%	0.0%
R1c. Special Schedule	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R1d. Wage System	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R1e. Highly Qualified Experts	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R1f. Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R2. Direct Hire Program Foreign Nationals (DHFN)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R3. Total Direct Hire	37	84	83	8,877	-	-	-	-	8,877	-	8,877	\$106,952	\$106,952	\$106,952	0.0%	0.0%
R4. Indirect Hire Foreign Nationals (IHFN)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal - Reimbursable Funded (excludes OC 13)	37	84	83	8,877	-	-	-	-	8,877	-	8,877	\$106,952	\$106,952	\$106,952	0.0%	0.0%
R5. Other Object Class 13 Benefits	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R5a. USDH - Benefits for Former Employees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R5b. DHFN - Benefits for Former Employees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R5c. Voluntary Separation Incentive Pay (VSIP)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R5d. Foreign National Separation Liability Accrual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Personnel (includes OC 13)	2,195	2,040	1,974	331,766	0	0	0	0	331,766	0	331,766	\$168,068	\$168,068	\$168,068	0.0%	0.0%
T1. US Direct Hire (USDH)	2,195	2,040	1,974	331,766	-	-	-	-	331,766	-	331,766	\$168,068	\$168,068	\$168,068	0.0%	0.0%
T1a. Senior Executive Schedule	0	6	6	954	0	0	0	0	954	0	954	\$159,000	\$159,000	\$159,000	0.0%	0.0%
T1b. General Schedule	2,195	2,034	1,968	330,812	0	0	0	0	330,812	0	330,812	\$168,096	\$168,096	\$168,096	0.0%	0.0%
T1c. Special Schedule	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-
T1d. Wage System	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-
T1e. Highly Qualified Experts	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-
T1f. Other	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-
T2. Direct Hire Program Foreign Nationals (DHFN)	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-
T3. Total Direct Hire	2,195	2,040	1,974	331,766	-	-	-	-	331,766	-	331,766	\$168,068	\$168,068	\$168,068	0.0%	0.0%
T4. Indirect Hire Foreign Nationals (IHFN)	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-
Subtotal - Total Funded (excludes OC 13)	2,195	2,040	1,974	331,766	-	-	-	-	331,766	-	331,766	\$168,068	\$168,068	\$168,068	0.0%	0.0%
T5. Other Object Class 13 Benefits	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T5a. USDH - Benefits for Former Employees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T5b. DHFN - Benefits for Former Employees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T5c. Voluntary Separation Incentive Pay (VSIP)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T5d. Foreign National Separation Liability Accrual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Department of the Air Force
 TOTAL CIVILIAN PERSONNEL COSTS
 OP-8B: OP-8 (PB)
 FY 2025 President's Budget Submission
 (FY 2024)

	(S in Thousands)											d/c l Basic Comp	i/c m Total Comp	Rates k/c n Comp & Benefits	h/d o % BC Variables	j/d p % BC Benefits
	a Begin Strength	b End Strength	c FTEs	d Basic Comp	e Overtime Pay	f Holiday Pay	g Other O.C.11	e + f + g h Total Variables	d + h i Comp O.C.11	i Benefits O.C.12/13	i + j k Comp & Benefits					
Direct Funded Personnel (includes OC 13)	1,949	2,283	2,283	391,842	0	0	0	0	391,842	0	391,842	\$171,635	\$171,635	\$171,635	0.0%	0.0%
D1. US Direct Hire (USDH)	1,949	2,283	2,283	391,842	-	-	-	-	391,842	-	391,842	\$171,635	\$171,635	\$171,635	0.0%	0.0%
D1a. Senior Executive Schedule	6	8	8	1,272	-	-	-	-	1,272	-	1,272	\$159,000	\$159,000	\$159,000	0.0%	0.0%
D1b. General Schedule	1,943	2,275	2,275	390,570	-	-	-	-	390,570	-	390,570	\$171,679	\$171,679	\$171,679	0.0%	0.0%
D1c. Special Schedule	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D1d. Wage System	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D1e. Highly Qualified Experts	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D1f. Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D2. Direct Hire Program Foreign Nationals (DHFN)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D3. Total Direct Hire	1,949	2,283	2,283	391,842	-	-	-	-	391,842	-	391,842	\$171,635	\$171,635	\$171,635	0.0%	0.0%
D4. Indirect Hire Foreign Nationals (IHFN)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Subtotal - Direct Funded (excludes OC 13)</i>	1,949	2,283	2,283	391,842	-	-	-	-	391,842	-	391,842	\$171,635	\$171,635	\$171,635	0.0%	0.0%
D5. Other Object Class 13 Benefits	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D5a. USDH - Benefits for Former Employees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D5b. DHFN - Benefits for Former Employees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D5c. Voluntary Separation Incentive Pay (VSIP)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D5d. Foreign National Separation Liability Accrual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reimbursable Funded Personnel (includes OC 13)	42	37	37	9,065	0	0	0	0	9,065	0	9,065	\$245,000	\$245,000	\$245,000	0.0%	0.0%
R1. US Direct Hire (USDH)	42	37	37	9,065	-	-	-	-	9,065	-	9,065	\$245,000	\$245,000	\$245,000	0.0%	0.0%
R1a. Senior Executive Schedule	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R1b. General Schedule	42	37	37	9,065	-	-	-	-	9,065	-	9,065	\$245,000	\$245,000	\$245,000	0.0%	0.0%
R1c. Special Schedule	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R1d. Wage System	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R1e. Highly Qualified Experts	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R1f. Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R2. Direct Hire Program Foreign Nationals (DHFN)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R3. Total Direct Hire	42	37	37	9,065	-	-	-	-	9,065	-	9,065	\$245,000	\$245,000	\$245,000	0.0%	0.0%
R4. Indirect Hire Foreign Nationals (IHFN)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Subtotal - Reimbursable Funded (excludes OC 13)</i>	42	37	37	9,065	-	-	-	-	9,065	-	9,065	\$245,000	\$245,000	\$245,000	0.0%	0.0%
R5. Other Object Class 13 Benefits	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R5a. USDH - Benefits for Former Employees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R5b. DHFN - Benefits for Former Employees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R5c. Voluntary Separation Incentive Pay (VSIP)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R5d. Foreign National Separation Liability Accrual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Personnel (includes OC 13)	1,991	2,320	2,320	400,907	0	0	0	0	400,907	0	400,907	\$172,805	\$172,805	\$172,805	0.0%	0.0%
T1. US Direct Hire (USDH)	1,991	2,320	2,320	400,907	-	-	-	-	400,907	-	400,907	\$172,805	\$172,805	\$172,805	0.0%	0.0%
T1a. Senior Executive Schedule	6	8	8	1,272	0	0	0	0	1,272	0	1,272	\$159,000	\$159,000	\$159,000	0.0%	0.0%
T1b. General Schedule	1,985	2,312	2,312	399,635	0	0	0	0	399,635	0	399,635	\$172,853	\$172,853	\$172,853	0.0%	0.0%
T1c. Special Schedule	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-
T1d. Wage System	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-
T1e. Highly Qualified Experts	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-
T1f. Other	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-
T2. Direct Hire Program Foreign Nationals (DHFN)	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-
T3. Total Direct Hire	1,991	2,320	2,320	400,907	-	-	-	-	400,907	-	400,907	\$172,805	\$172,805	\$172,805	0.0%	0.0%
T4. Indirect Hire Foreign Nationals (IHFN)	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-
<i>Subtotal - Total Funded (excludes OC 13)</i>	1,991	2,320	2,320	400,907	-	-	-	-	400,907	-	400,907	\$172,805	\$172,805	\$172,805	0.0%	0.0%
T5. Other Object Class 13 Benefits	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T5a. USDH - Benefits for Former Employees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T5b. DHFN - Benefits for Former Employees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T5c. Voluntary Separation Incentive Pay (VSIP)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T5d. Foreign National Separation Liability Accrual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Department of the Air Force
 TOTAL CIVILIAN PERSONNEL COSTS
 OP-8B: OP-8 (PB)
 FY 2025 President's Budget Submission
 (FY 2025)

	(S in Thousands)											d/c l Basic Comp	i/c m Total Comp	Rates k/c n Comp & Benefits	h/d o % BC Variables	j/d p % BC Benefits
	a Begin Strength	b End Strength	c FTEs	d Basic Comp	e Overtime Pay	f Holiday Pay	g Other O.C.11	e + f + g h Total Variables	d + h i Comp O.C.11	i Benefits O.C.12/13	i + j k Comp & Benefits					
Direct Funded Personnel (includes OC 13)	2,283	2,280	2,280	296,456	0	0	0	0	296,456	104,808	401,264	\$130,025	\$130,025	\$175,993	0.0%	35.4%
D1. US Direct Hire (USDH)	2,283	2,280	2,280	296,456	-	-	-	-	296,456	104,808	401,264	\$130,025	\$130,025	\$175,993	0.0%	35.4%
D1a. Senior Executive Schedule		8	8	1,440					1,440	518	1,958	\$180,000	\$180,000	\$244,750	0.0%	36.0%
D1b. General Schedule	2,275	2,272	2,272	295,016					295,016	104,290	399,306	\$129,849	\$129,849	\$175,751	0.0%	35.4%
D1c. Special Schedule	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D1d. Wage System	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D1e. Highly Qualified Experts	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D1f. Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D2. Direct Hire Program Foreign Nationals (DHFN)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D3. Total Direct Hire	2,283	2,280	2,280	296,456	-	-	-	-	296,456	104,808	401,264	\$130,025	\$130,025	\$175,993	0.0%	35.4%
D4. Indirect Hire Foreign Nationals (IHFN)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Subtotal - Direct Funded (excludes OC 13)</i>	2,283	2,280	2,280	296,456	-	-	-	-	296,456	104,808	401,264	\$130,025	\$130,025	\$175,993	0.0%	35.4%
D5. Other Object Class 13 Benefits	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D5a. USDH - Benefits for Former Employees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D5b. DHFN - Benefits for Former Employees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D5c. Voluntary Separation Incentive Pay (VSIP)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D5d. Foreign National Separation Liability Accrual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reimbursable Funded Personnel (includes OC 13)	37	37	37	9,260	0	0	0	0	9,260	0	9,260	\$250,270	\$250,270	\$250,270	0.0%	0.0%
R1. US Direct Hire (USDH)	37	37	37	9,260	-	-	-	-	9,260	-	9,260	\$250,270	\$250,270	\$250,270	0.0%	0.0%
R1a. Senior Executive Schedule	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R1b. General Schedule	37	37	37	9,260	-	-	-	-	9,260	-	9,260	\$250,270	\$250,270	\$250,270	0.0%	0.0%
R1c. Special Schedule	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R1d. Wage System	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R1e. Highly Qualified Experts	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R1f. Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R2. Direct Hire Program Foreign Nationals (DHFN)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R3. Total Direct Hire	37	37	37	9,260	-	-	-	-	9,260	-	9,260	\$250,270	\$250,270	\$250,270	0.0%	0.0%
R4. Indirect Hire Foreign Nationals (IHFN)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Subtotal - Reimbursable Funded (excludes OC 13)</i>	37	37	37	9,260	-	-	-	-	9,260	-	9,260	\$250,270	\$250,270	\$250,270	0.0%	0.0%
R5. Other Object Class 13 Benefits	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R5a. USDH - Benefits for Former Employees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R5b. DHFN - Benefits for Former Employees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R5c. Voluntary Separation Incentive Pay (VSIP)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R5d. Foreign National Separation Liability Accrual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Personnel (includes OC 13)	2,320	2,317	2,317	305,716	0	0	0	0	305,716	104,808	410,524	\$131,945	\$131,945	\$177,179	0.0%	34.3%
T1. US Direct Hire (USDH)	2,320	2,317	2,317	305,716	-	-	-	-	305,716	104,808	410,524	\$131,945	\$131,945	\$177,179	0.0%	34.3%
T1a. Senior Executive Schedule		8	8	1,440	0	0	0	0	1,440	518	1,958	\$180,000	\$180,000	\$244,750	0.0%	36.0%
T1b. General Schedule	2,312	2,309	2,309	304,276	0	0	0	0	304,276	104,290	408,566	\$131,778	\$131,778	\$176,945	0.0%	34.3%
T1c. Special Schedule	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-
T1d. Wage System	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-
T1e. Highly Qualified Experts	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-
T1f. Other	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-
T2. Direct Hire Program Foreign Nationals (DHFN)	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-
T3. Total Direct Hire	2,320	2,317	2,317	305,716	-	-	-	-	305,716	104,808	410,524	\$131,945	\$131,945	\$177,179	0.0%	34.3%
T4. Indirect Hire Foreign Nationals (IHFN)	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-
<i>Subtotal - Total Funded (excludes OC 13)</i>	2,320	2,317	2,317	305,716	-	-	-	-	305,716	104,808	410,524	\$131,945	\$131,945	\$177,179	0.0%	34.3%
T5. Other Object Class 13 Benefits	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T5a. USDH - Benefits for Former Employees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T5b. DHFN - Benefits for Former Employees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T5c. Voluntary Separation Incentive Pay (VSIP)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T5d. Foreign National Separation Liability Accrual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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ACRONYMS

GENERAL ACRONYMS

A&AS	- Advisory & Assistance Services
ABIDES	- Automated Budget Interactive Data Environment System
ACAT	- Acquisition Category
ACTD	- Advanced Concept Technology Demonstration
AGM	- Air-to-Ground Missile
AIM	- Air Intercept Missile
AIS	- Avionics Intermediate Shop
ACMI	- Aircraft Combat Maneuvering Instrumentation
AMRAAM	- Advanced Medium-Range Air-to-Air Missile
APPN	- Appropriation
ATD	- Advanced Technology Development
BA	- Budget Activity
BES	- Budget Estimate Submission
BY	- Budget Year
C3	- Command, Control, and Communication System
CFE	- Contractor Furnished Equipment
CONOPS	- Concept of Operation
CONUS	- Continental United States
CPMS	- Comprehensive Power Management System
CPT	- Cockpit Procedures Trainer
CRA	- Continuing Resolution Authority
CTS	- Countermeasures Test Set
CY	- Current Year
ECCM	- Electronic Counter Counter-Measures
ECM	- Electronic Counter Measures
ECO	- Engineering Change Orders
EOQ	- Economic Order Quantity
ECP	- Engineering Change Proposal
EPA	- Economic Price Adjustment
EW	- Electronic Warfare
EWAISP	- Electronic Warfare Avionics Integration Support Facility
FLIR	- Forward Looking Infra Red

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FOT&E	- Follow-on Test and Evaluation
FOC	- Fully Operational Capability
FLTS	- Flight Line Test Set
FPIF	- Fixed Price Incentive Firm
FPIS	- Fixed Price Incentive Fee, Successive Targets
FY	- Fiscal Year
GANS	- Global Access Navigation & Safety
GATM	- Global Air Traffic Management
GFE	- Government Furnished Equipment
GFP	- Government Furnished Property
GPS	- Global Positioning System
GSE	- Ground Support Equipment
ICS	- Interim Contractor Support
IOC	- Initial Operating Capability
IT	- Information Technology
JUON	- Joint Urgent Operational Need
MAIS	- Major Automated Information System Program
MDAP	- Major Defense Acquisition Program
METS	- Mobile Electronic Test Stations
MYP	- Multiyear Procurement
NAVWAR	- Navigation Warfare
NMC Rate	- Not Mission Capable Rate
OCO	- Overseas Contingency Operations
OOC	- Overseas Operations Costs
OT&E	- Operational Test and Evaluation
OWRM	- Other War Reserve Material
PAGEL	- Priced Aerospace Ground Equipment List
PB	- President's Budget
PBR	- Program Budget Review
PMA	- Program Management Administration
PMC	- Procurement Method Code
PNO	- Acquisition Program Number (MDAP Codes)
PR	- Purchase Request
PRCP	- Program Resource Collection Process
PTT	- Part Task Trainer
PY	- Prior Year

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R&M	- Reliability and Maintainability
RAA	- Rapid Acquisition Authority
RDT&E	- Research, Development, Test and Evaluation
RWR	- Radar Warning Receiver
ROM	- Rough Order of Magnitude
SS	- Sole Source
SOF	- Special Operation Force
TAF	- Tactical Air Force
TCAS	- Traffic Collision Alert and Avoidance System
TEWS	- Tactical Electronic Warfare System
TISS	- TEWS Intermediate Support System
TOA	- Total Obligation Authority
WCF	- Working Capital Fund
WRM	- War Reserve Material
WST	- Weapon System Trainer
UAV	- Unmanned Aerial Vehicle
XML	- Extensible Markup Language

BASE / ORGANIZATIONAL ACRONYMS

ACC	- Air Combat Command
AETC	- Air Education & Training Command
AFCAO	- Air Force Computer Acquisition Office
AFCEA	- Air Force Civil Engineering Support Agency
AFCIC	- AF Communications & Information Center
AFCSC	- Air Force Cryptologic Service Center
AFESC	- Air Force Engineering Services Center
AFGWC	- Air Force Global Weather Central
AFIT	- Air Force Institute of Technology
AFLCMC	- Air Force Life Cycle Management Center
AFMC	- Air Force Materiel Command
AFMETCAL	- Air Force Metrology and Calibration Office
AFMLO	- Air Force Medical Logistics Office
AFOSI	- Air Force Office of Special Investigation
AFOTEC	- Air Force Operational Test & Evaluation Center
AFPC	- Air Force Personnel Center

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AFPSL	- AF Primary Standards Lab
AFR	- Air Force Reserve
AFSOC	- AF Special Operations Command
AFSPC	- Air Force Space Command
AIA	- Air Intelligence Agency
ALC	- Air Logistics Center
AMC	- Air Mobility Command
ANG	- Air National Guard
ASC	- Aeronautical Systems Center
AETC	- Air Education Training Command
AU	- Air University
AWS	- Air Weather Service
CIA	- Central Intelligence Agency
DGSC	- Defense General Support Center
DLA	- Defense Logistics Center
DOE	- Department of Energy
DPSC	- Defense Personnel Support Center
DSCC	- Defense Supply Center, Columbus
DTIC	- Defense Technical Information Center
ER	- Eastern Range
ESC	- Electronic Systems Center
FAA	- Federal Aviation Agency
FBI	- Federal Bureau of Investigation
GSA	- General Services Administration
JCS	- Joint Chiefs of Staff
NATO	- North Atlantic Treaty Organization
OSD	- Office of the Secretary of Defense
PACAF	- Pacific Air Forces
USAF	- United States Air Force
USAFA	- United States Air Force Academy
USAFE	- United States Air Force Europe
USCENTCOM	- United States Central Command
USEUCOM	- United States European Command
USMC	- United States Marine Corps
USSTRATCOM	- United States Strategic Command
WP AFB	- Wright-Patterson AFB, OH

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CONTRACT METHOD / TYPE ACRONYMS

C	- Competitive
BA	- Basic Agreement
BOA	- Basic Ordering Agreement
BPA	- Blanket Purchasing Agreement
CS	- Cost Sharing
IDDQ	- Indefinite Delivery, Definite Quantity
IDIQ	- Indefinite Delivery, Indefinite Quantity
IDRT	- Indefinite Delivery, Requirements
Letter	- Letter
LH	- Labor-hour
MIPR	- Military Interdepartmental Purchase Request
MIPR-C	- Military Interdepartmental Purchase Request - Competitive
MIPR-OPT	- Military Interdepartmental Purchase Request - Option
MIPR-OTH	- Military Interdepartmental Purchase Request – Other
MIPR-SS	- Military Interdepartmental Purchase Request - Sole Source
OPT	- Option
OTH	- Other
PO	- Project Order
REQN	- Requisition
SS	- Sole Source
T&M	- Time and Materials
UCA	- Undefinitized Contract Action
WP	- Work Project

CONTRACTED BY ACRONYMS

11 WING	- 11th Support Wing, Washington, DC
ACC	- Air Combat Command, Langley AFB, VA
AEDC	- Arnold Engineering Development Center, Arnold AFB, TN
AAC	- Air Armament Center, Eglin AFB, FL
AEDC	- Arnold Engineering Development Center, Arnold AFB, TN
AETC	- Air Education and Training Command, Randolph AFB, TX
AFCIC	- Air Force Communications and Information Center, Washington, DC
AFCESA	- Air Force Civil Engineering Support Agency, Tyndall AFB, FL

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AFFTC	- Air Force Flight Test Center, Edwards AFB, CA
AFLCMC	- Air Force Life Cycle Management Center, Wright-Patterson AFB, OH
AFMC	- Air Force Materiel Command, Wright-Patterson AFB, OH
AFMETCAL	- Air Force Metrology and Calibration Office, Heath, Ohio
AFMLO	- Air Force Medical Logistics Office, Ft Detrick, MD
AIA	- Air Intelligence Agency, Kelly AFB, TX
AMC	- Air Mobility Command, Scott AFB, IL
ASC	- Aeronautical Systems Center, Wright-Patterson AFB, OH & Eglin AFB, FL
AFWA	- Air Force Weather Agency, Offutt AFB, NE
DGSC	- Defense General Support Center, Richmond, VA
DPSC	- Defense Personnel Support Center, Philadelphia, PA
ER	- Eastern Range, Patrick SFB, FL
ESC	- Electronic Systems Center, Hanscom AFB, MA
HSC	- Human Services Center, Brook AFB, TX
OC-ALC	- Oklahoma City Air Logistics Center, Tinker AFB, OK
OO-ALC	- Ogden Air Logistics Center, Hill AFB, UT
SMC	- Space & Missile Systems Center, Los Angeles AFB, CA
US STRATCOM	- US Strategic Command, Offutt AFB, NE
WACC	- Washington Area Contracting Center, Washington DC
WR	- Western Range, Vandenberg SFB, CA
WR-ALC	- Warner-Robins Air Logistics Center, Robins AFB, GA
AFSPC	- Air Force Space Command, Peterson AFB, CO
HQ ANG	- Headquarters, Air National Guard, Washington, DC
USAFE	- United States Air Force Europe, Ramstein AB, GE
USAFA	- United States Air Force Academy, Colorado Springs, CO

IDENTIFICATION CODES

Code "A"	- Line items of material which have been approved for Air Force service use.
Code "B"	- Line items of material that have not been approved for Service use
OBAN	- Operating Budget Account Number, 2-digit code for unit allocated funds

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
3620F: <i>Research, Development, Test & Evaluation, Space Force</i> / BA 1: <i>Basic Research</i>					PE 0601102SF / <i>Defense Research Sciences</i>							
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	24.359	0.000	21.349	0.000	21.349	22.820	24.584	26.866	27.820	Continuing	Continuing
610001: <i>Defense Research Sciences - Space</i>	-	24.359	0.000	21.349	0.000	21.349	22.820	24.584	26.866	27.820	Continuing	Continuing

Note

In FY 2023, Program Element began with CII funding. In FY 2025, some efforts from PE 0601102F/Defense Research Sciences, Project 613001/Physics and Electronics and Project 613004/Education and Outreach were transferred to PE 0601102SF/Defense Research Sciences, Project 610001/Defense Research Sciences - Space, for space-unique research.

A. Mission Description and Budget Item Justification

Defense Research Sciences consists of research activities in academia and industry along with research performed in the Department of the Air Force (DAF), including the Air Force Research Laboratory, Air Force Institute of Technology, and the United States Air Force Academy. This program supports basic broad-based scientific and engineering research in areas critical to the five core technical competencies of the United States Space Force: Space Security; Combat Power Projection; Space Mobility and Logistics; Information Mobility; and Space Domain Awareness, while simultaneously building capacity in academia and cultivating the Science, Technology, Engineering, and Mathematics (STEM) pipeline. All research areas are subject to long-range planning and technical review by both DAF and tri-Service scientific planning groups. Efforts in this program have been coordinated through the Department of Defense (DoD) Science and Technology (S&T) Executive Committee process to harmonize efforts and eliminate duplication.

In order to manage, execute, and deliver science and technology capabilities, this program element may include: necessary civilian pay expenses; expenses to support the operation and maintenance of facilities; as well as expenses related to travel, supplies, IT hardware, software and support, administrative contractor services, etc.

Funds in this program element may be used to investigate specified science advancements primarily targeted to challenges in the space domain and multi-domain research with space-domain application.

This program is in Budget Activity 1, Basic Research because this budget activity includes scientific study and experimentation directed toward increasing fundamental knowledge and understanding in those fields of the physical, engineering, environmental, and life sciences related to long-term national security needs.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force</i> / BA 1: <i>Basic Research</i>	R-1 Program Element (Number/Name) PE 0601102SF / <i>Defense Research Sciences</i>
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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	25.000	0.000	0.000	0.000	0.000
Current President's Budget	24.359	0.000	21.349	0.000	21.349
Total Adjustments	-0.641	0.000	21.349	0.000	21.349
• 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	-0.641	0.000			
• Other Adjustments	0.000	0.000	21.349	0.000	21.349

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 610001: *Defense Research Sciences - Space*

Congressional Add: *Program increase: Basic Research*

Congressional Add Subtotals for Project: 610001

Congressional Add Totals for all Projects

	FY 2023	FY 2024
	24.359	0.000
Congressional Add Subtotals for Project: 610001	24.359	0.000
Congressional Add Totals for all Projects	24.359	0.000

Change Summary Explanation

FY 2025 funding in the Current President's Budget increased compared to the Previous President's Budget by \$21.349M. Funding increased due to a transfer from the U.S. Air Force to the U.S. Space Force for space-unique research.

C. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Space-focused Basic Research	0.000	0.000	18.575
Description: Foster basic research discovery in physical and biological sciences that enhance U.S. Space Force's ability to conduct global space operations.			
FY 2024 Plans: Not Applicable			
FY 2025 Plans: Basic research allows for endless exploration. Current basic research efforts include, but are not limited to, Space Physics, Astrodynamics, and Space Biosciences. Seek to further understand the solar terrestrial environment extending from the Sun			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force</i> / BA 1: <i>Basic Research</i>		R-1 Program Element (Number/Name) PE 0601102SF / <i>Defense Research Sciences</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>through Earth's magnetosphere and radiation belts to the mesosphere and lower thermosphere region to improve operational space weather forecasting. Advance the fundamental understanding of the physical processes that impact the motion and control of both natural and artificial objects moving in the gravity fields associated with the Earth/Moon/Sun system needed to enable future operations beyond geostationary earth orbits (X-GEO) operations. Conduct research in life sciences such as synthetic biology, biologically produced components, and biological processes to understand and mitigate the impacts of harsh and remote environments on future operations and future assets. Explore theories, principles, and practical concepts of physical and biological sciences in harsh and remote environments to identify solutions to current and future U.S. Space Force mission needs. Science discovered in this effort will have a profound impact on future long-term, large-scale military operations in space as well as applications to other emerging DAF mission needs such as missions to remote regions in Antarctica and very high-altitude air missions. Explore novel ideas that may bridge these major efforts and enhance global space operations.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased compared to FY 2024 by 18.575M. Increase is a result of a transfer from USAF Program Element PE 0601102F/ Defense Research Sciences, Project 613001/Physics and Electronics and Project 613004/Education and Outreach into this USSF Program Element 0601102SF/Defense Research Sciences, Project 610001/Defense Research Sciences - Space, for space-unique research.</p>				
<p>Title: Outreach to International S&T Community</p> <p>Description: Foster international basic research discovery by supporting direct interchanges with a broad range of key international researchers and communities. Identify and leverage international scientific advances when appropriate.</p> <p>FY 2024 Plans: Not Applicable</p> <p>FY 2025 Plans: Leverage international expertise to identify and maintain awareness of foreign scientific developments. Explore foreign investments and influence world-class scientific research on specific topics of interest to the U.S. Space Force. Pursue access to fundamental scientific discoveries outside the U.S. that are relevant to the U.S. Space Force. Support international visits by scientists and high-level DoD fundamental science delegations, providing primary interface to coordinate international science and technology participation among DoD organizations.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased compared to FY 2024 by .816M. Increase is a result of a transfer from USAF Program Element PE 0601102F/ Defense Research Sciences, Project 613001/Physics and Electronics and Project 613004/Education and Outreach into this USSF</p>		0.000	0.000	0.816

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 1: Basic Research</i>	R-1 Program Element (Number/Name) PE 0601102SF / <i>Defense Research Sciences</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
Program Element 0601102SF/Defense Research Sciences, Project 610001/Defense Research Sciences - Space, for space-unique research.			
Title: Outreach to U.S. S&T Workforce	0.000	0.000	1.958
Description: Strengthen science, mathematics, and engineering research and infrastructure in the U.S., thereby strengthening current and future U.S. Space Force S&T capabilities.			
FY 2024 Plans: Not Applicable			
FY 2025 Plans: Identify and increase opportunities for scientists and engineers to participate in critical U.S. Space Force research. Provide hands-on exposure to cutting-edge research to prepare future generations of scientists and engineers in fields critical to maintaining the technological superiority of the U.S. Space Force.			
FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased compared to FY 2024 by 1.958M. Increase is a result of a transfer from USAF Program Element PE 0601102F/ Defense Research Sciences, Project 613001/Physics and Electronics and Project 613004/Education and Outreach into this USSF Program Element 0601102SF/Defense Research Sciences, Project 610001/Defense Research Sciences - Space, for space-unique research.			
Accomplishments/Planned Programs Subtotals	0.000	0.000	21.349

	FY 2023	FY 2024
Congressional Add: Program increase: Basic Research	24.359	0.000
FY 2023 Accomplishments: Conducted Congressionally directed effort		
FY 2024 Plans: Not Applicable		
Congressional Adds Subtotals	24.359	0.000

D. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

E. Acquisition Strategy
Not Applicable

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force</i> / BA 1: <i>Basic Research</i>	R-1 Program Element (Number/Name) PE 0601103SF / <i>University Research Initiatives</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	28.902	0.000	14.731	0.000	14.731	14.916	16.742	17.553	17.902	Continuing	Continuing
610002: <i>University Research Initiatives - Space</i>	-	28.902	0.000	14.731	0.000	14.731	14.916	16.742	17.553	17.902	Continuing	Continuing

Note

In FY 2023, Program Element began with CII funding. In FY 2025, some efforts from PE 0601103F/University Research Initiatives, Project 615094/University Research Initiatives, were transferred to PE 0601103SF/University Research Initiatives, Project 610002/University Research Initiatives - Space, for space-unique research.

A. Mission Description and Budget Item Justification

This program supports defense-related basic research in a wide range of scientific and engineering disciplines relevant to maintaining U.S. military technology superiority. Research topics include, but are not limited to, revolutionary and high priority technologies critical to the five core technical competencies of the United States Space Force: Space Security; Combat Power Projection; Space Mobility and Logistics; Information Mobility; and Space Domain Awareness. The program also enhances and promotes the education of U.S. scientists and engineers in disciplines critical to maintaining, advancing, and enabling future U.S. defense technologies. This program assists universities in establishing superior instrumentation capabilities needed to improve the quality of defense-related research and education. A fundamental component of this program is the recognition that future technologies and technology exploitations require highly coordinated and concerted multi- and inter-disciplinary efforts. Efforts in this program have been coordinated through the Department of Defense Science and Technology Executive Committee process to harmonize efforts and eliminate duplication.

In order to manage, execute, and deliver science and technology capabilities, this program element may include: necessary civilian pay expenses; expenses to support the operation and maintenance of facilities; as well as expenses related to travel, supplies, IT hardware, software and support, administrative contractor services, etc.

Funds in this program element may be used to investigate specified science advancements primarily targeted to challenges in the space domain and multi-domain research with space-domain application.

This program is in Budget Activity 1, Basic Research because this budget activity includes scientific study and experimentation directed toward increasing fundamental knowledge and understanding in those fields of the physical, engineering, environmental, and life sciences related to long-term national security needs.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force</i> / BA 1: <i>Basic Research</i>	R-1 Program Element (Number/Name) PE 0601103SF / <i>University Research Initiatives</i>
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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	30.000	0.000	0.000	0.000	0.000
Current President's Budget	28.902	0.000	14.731	0.000	14.731
Total Adjustments	-1.098	0.000	14.731	0.000	14.731
• 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	-1.098	0.000			
• Other Adjustments	0.000	0.000	14.731	0.000	14.731

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 610002: *University Research Initiatives - Space*

Congressional Add: *Program increase: Defense University Research Instrumentation Program*

Congressional Add Subtotals for Project: 610002

Congressional Add Totals for all Projects

	FY 2023	FY 2024
	28.902	0.000
	28.902	0.000
	28.902	0.000

Change Summary Explanation

FY 2025 funding in the Current President's Budget increased compared to the Previous President's Budget by \$14.731M. Funding increased due to a transfer from the U.S. Air Force to the U.S. Space Force for space-unique research.

C. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Multidisciplinary University Research Initiative	0.000	0.000	11.791	0.000	11.791
Description: Promote fundamental, multi- and interdisciplinary science and engineering research projects involving multiple principal investigators.					
FY 2024 Plans: Not Applicable					
FY 2025 Base Plans:					

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 1: Basic Research</i>	R-1 Program Element (Number/Name) PE 0601103SF / <i>University Research Initiatives</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
<p>Fund competitive research grants at U.S. universities that focus on significantly expanding the basic knowledge of Department of the Air Force-relevant science and technology areas critical to the U.S. Space Force core technical competencies. Focus on complex research efforts not normally achievable in smaller funded, single investigator awards.</p> <p>FY 2025 OCO Plans: Not Applicable</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased compared to FY 2024 by 11.791M. Increase is a result of a transfer from USAF Program Element PE 0601103F/ University Research Initiatives, Project 615094/University Research Initiatives into this USSF Program Element 0601103SF/Defense Research Sciences, Project 610002/University Research Initiatives - Space, for space-unique research.</p>					
<p>Title: Research Instrumentation</p> <p>Description: Enhance scientific and engineering research through advanced education infrastructure and instrumentation at U.S. universities.</p> <p>FY 2024 Plans: Not Applicable</p> <p>FY 2025 Base Plans: Award grants on a competitive basis under the Defense University Research Instrumentation Program to U.S. universities to acquire state-of-the-art, high technology instrumentation and infrastructure to enhance U.S. Space Force research and educational capabilities.</p> <p>FY 2025 OCO Plans: Not Applicable</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased compared to FY 2024 by 2.940M. Increase is a result of a transfer from USAF Program Element PE 0601103F/ University Research Initiatives, Project 615094/University Research Initiatives into this USSF Program Element 0601103SF/Defense Research Sciences, Project 610002/University Research Initiatives - Space, for space-unique research.</p>	0.000	0.000	2.940	0.000	2.940
Accomplishments/Planned Programs Subtotals	0.000	0.000	14.731	0.000	14.731

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force</i> / BA 1: <i>Basic Research</i>	R-1 Program Element (Number/Name) PE 0601103SF / <i>University Research Initiatives</i>
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	FY 2023	FY 2024
Congressional Add: Program increase: Defense University Research Instrumentation Program	28.902	0.000
FY 2023 Accomplishments: Conducted Congressionally directed effort		
FY 2024 Plans: Not Applicable		
Congressional Adds Subtotals	28.902	0.000

D. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

E. Acquisition Strategy

Not Applicable

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 2: Applied Research</i>	R-1 Program Element (Number/Name) PE 1202212SF / <i>Defense Laboratories R&D Projects</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	14.330	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	14.330
622030: <i>Defense Lab R&D Projects</i>	-	14.330	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	14.330

A. Mission Description and Budget Item Justification

Implementation of 10 U.S.C. Section 4123, amendment to 10 U.S.C. Section 2363, to fund: innovative basic and applied research conducted at the defense laboratory and supports military missions; development programs supporting the transition of technologies developed by the defense laboratory into operational use; workforce development activities improving the capacity of the defense laboratory to recruit and retain personnel with necessary scientific and engineering expertise that support military missions; and the repair or minor military construction of the laboratory infrastructure and equipment.

The United States Space Force (USSF) is dependent on technological advances in response to emerging threats and to maintain a competitive advantage. The USSF has a comprehensive and deliberative planning process to identify and fund research that is expected to have the greatest benefit to the USSF and the warfighter. 10 U.S.C. Section 4123 provides the Commander of the Air Force Research Laboratory (AFRL), in consultation with the Department of the Air Force Science and Technology Executive, a degree of flexibility to rapidly exploit scientific breakthroughs or respond to emerging threats, to include developing a skilled workforce and necessary infrastructure. This flexibility increases the rate of innovation and accelerates the development and fielding of needed military capabilities to address current and future problems.

In FY 2021 the USSF established Program Element (PE) 1202212SF, which internally reprograms 10 U.S.C. Section 4123 funds to this USSF program element in the year of execution after receipt of the appropriation. This allows increased transparency to Congress on 10 U.S.C. Section 4123 funding and additional execution flexibility for 10 U.S.C. Section 4123 activities to cross all technology areas. This is a parallel effort to United States Air Force (USAF) PE 0602212F, which also internally reprograms 10 U.S.C. Section 4123 funds into the USAF program element in the year of execution after receipt of the appropriation.

This program is in Budget Activity 2, Applied Research because this budget activity includes studies, investigations, and non-system specific technology efforts directed toward general military needs with a view toward developing and evaluating the feasibility and practicality of proposed solutions and determining their parameters.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 2: Applied Research	R-1 Program Element (Number/Name) PE 1202212SF I Defense Laboratories R&D Projects
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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	14.330	0.000	0.000	0.000	0.000
Total Adjustments	14.330	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	0.000	0.000			
• Other Adjustments	14.330	0.000	0.000	0.000	0.000

Change Summary Explanation

Increase in FY 2023 in Other Adjustments is due to realignment of funds to PE 1202212SF to support Research and Development Projects, 10 U.S.C. Section 4123.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
Title: Defense Laboratories R&D Projects - Air Force Research Laboratory	14.330	0.000	0.000
Description: Implementation of 10 U.S.C. Section 2363, amendment to PL 110-417, 10 U.S.C. Section 2358 and 10 U.S.C. 2805(d)(1)(B), to fund: innovative basic and applied research conducted at the Air Force Research Laboratory (AFRL) and supports military missions; development programs supporting the transition of technologies developed by AFRL into operational use; workforce development activities improving the capacity of AFRL to recruit and retain personnel with necessary scientific and engineering expertise that support military missions; and the repair or minor military construction of the laboratory infrastructure and equipment.			
FY 2024 Plans: NA			
FY 2025 Plans: N/A			
FY 2024 to FY 2025 Increase/Decrease Statement: N/A			
Accomplishments/Planned Programs Subtotals	14.330	0.000	0.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force Date: March 2024

Appropriation/Budget Activity
3620F: *Research, Development, Test & Evaluation, Space Force I BA 2: Applied Research*

R-1 Program Element (Number/Name)
PE 1202212SF / *Defense Laboratories R&D Projects*

D. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

E. Acquisition Strategy

Not Applicable

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 2: Applied Research	R-1 Program Element (Number/Name) PE 1206601SF / Space Technology
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	355.174	206.196	244.964	0.000	244.964	251.303	267.412	272.650	278.213	Continuing	Continuing
620200: Enterprise Transformational Appld Research	-	0.000	0.000	9.193	0.000	9.193	7.014	7.015	7.015	7.014	Continuing	Continuing
621010: Space Survivability & Surveillance	-	56.399	41.591	42.502	0.000	42.502	38.900	41.603	42.743	43.640	Continuing	Continuing
624846: Spacecraft Payload Technologies	-	61.582	71.286	43.953	0.000	43.953	45.773	47.625	49.094	50.123	Continuing	Continuing
624847: Rocket Propulsion Technology	-	15.511	14.483	28.214	0.000	28.214	29.099	30.071	30.994	31.643	Continuing	Continuing
624866: Lasers & Imaging Technology	-	31.318	19.985	30.298	0.000	30.298	31.629	33.114	32.097	32.768	Continuing	Continuing
625018: Spacecraft Protection Technology	-	33.727	32.345	42.834	0.000	42.834	49.936	56.553	57.929	59.141	Continuing	Continuing
628809: Spacecraft Vehicle Technologies	-	156.637	26.506	47.970	0.000	47.970	48.952	51.431	52.778	53.884	Continuing	Continuing

Note
 This program, BA 2, PE 1206601SF, project , Explore, is a new start.
 This program, BA 2, PE 1206601SF, project , Seedlings for Disruptive Capabilities, is a new start.

Program Element 1206601SF/Space Technology, Project 620200/Enterprise Transformational Appld Research, is a new start under the 3620 appropriation. The (1) Explore and (2) Seedlings for Disruptive Capabilities Thrusts are FY25 transfers of Space domain efforts from 3600 USAF Program Element 0602020F/Future AF Capabilities Applied Research, Project 620200/Enterprise Transformational Appld Research.

A. Mission Description and Budget Item Justification

This program focuses on seven major areas. First, the Space Survivability and Surveillance area develops technologies to understand space weather and the geophysics environment for mitigation and exploitation of these effects to Department of Air Force systems. Second, the spacecraft payload technologies area improves satellite payload operations by developing advanced materials/components, networking, analysis tools, and subsystem capabilities. Third, the rocket propulsion technology area develops rocket propulsion and associated technologies for space access, space maneuver, and strategic systems. Fourth, the lasers & imaging technology area conducts research supporting ground-based optical space situational awareness and ground-to-space laser-enabled communication. Fifth, the

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 2: Applied Research</i>	R-1 Program Element (Number/Name) PE 1206601SF / <i>Space Technology</i>
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spacecraft protection area develops technologies for protecting United States space assets in potential hostile settings. The sixth major area, spacecraft vehicles, focuses on spacecraft platform and control technologies, operator effectiveness, and human-machine interactions. The last area, enterprise transformational applied research develops multidisciplinary applied research efforts to accelerate the technology pipeline of transformational capabilities. Efforts in this program have been coordinated through the Department of Defense Science and Technology Executive Committee process to harmonize efforts and eliminate duplication.

In order to manage, execute, and deliver science and technology capabilities, this program element may include: Necessary civilian pay expenses; expenses to support the operation and maintenance of facilities; as well as expenses related to travel, supplies, IT hardware, software and support, administrative contractor services, etc.

This program is in Budget Activity 2, Applied Research because this budget activity includes studies, investigations, and non-system specific technology efforts directed toward general military needs with a view toward developing and evaluating the feasibility and practicality of proposed solutions and determining their parameters.

B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	360.286	206.196	157.742	0.000	157.742
Current President's Budget	355.174	206.196	244.964	0.000	244.964
Total Adjustments	-5.112	0.000	87.222	0.000	87.222
• 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	10.000	0.000			
• SBIR/STTR Transfer	-5.028	0.000			
• Other Adjustments	-10.084	0.000	87.222	0.000	87.222

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 624847: *Rocket Propulsion Technology*

Congressional Add: *Propulsion Technology*

Congressional Add Subtotals for Project: 624847

Project: 625018: *Spacecraft Protection Technology*

Congressional Add: *Congressional Add: Program increase - ground-based interferometry*

Congressional Add: *Congressional Add: Program Increase - digital engineering and modeling for space domain awareness*

Congressional Add: *Congressional Add: Program Increase - lunar surface space domain awareness*

Congressional Add: *Congressional Add: Program Increase - SOSA-based spacecraft protection technology*

	FY 2023	FY 2024
	4.930	-
	4.930	-
	1.972	-
	9.367	-
	3.944	-
	9.860	-

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 2: Applied Research</i>	R-1 Program Element (Number/Name) PE 1206601SF / <i>Space Technology</i>
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<u>Congressional Add Details (\$ in Millions, and Includes General Reductions)</u>	FY 2023	FY 2024
Congressional Add Subtotals for Project: 625018	25.143	-
Project: 628809: <i>Spacecraft Vehicle Technologies</i>		
Congressional Add: <i>Congressional Add: Program increase - thin-film photovoltaic energy</i>	2.958	-
Congressional Add: <i>Congressional Add: Program increase - hybrid space architecture</i>	4.930	-
Congressional Add: <i>Congressional Add: Program increase - university consortia for space technology</i>	19.721	-
Congressional Add: <i>Congressional Add: Program increase - aerospace films for increased operational range of reconnaissance</i>	5.916	-
Congressional Add: <i>Congressional Add: Program increase - 3D graphene lithium-sulfur batteries</i>	4.930	-
Congressional Add: <i>Congressional Add: Program increase - L-Band active phased array demonstration</i>	2.958	-
Congressional Add: <i>Congressional Add: Program increase - next generation multiband space array antenna</i>	9.860	-
Congressional Add: <i>Congressional Add: Program increase - advanced analog microelectronics</i>	2.958	-
Congressional Add: <i>Congressional Add: Program increase - spectrum superiority lab</i>	4.930	-
Congressional Add: <i>Congressional Add: Program increase - advanced space power systems</i>	9.269	-
Congressional Add: <i>Congressional Add: Program increase - cybersecurity for a hybrid space architecture</i>	14.791	-
Congressional Add: <i>Congressional Add: Program increase - flexible solar panels</i>	4.930	-
Congressional Add: <i>Congressional Add: Program increase - high efficiency lightweight RF amplifiers for LEO constellation</i>	4.930	-
Congressional Add: <i>Congressional Add: Program increase - moving target engagement solutions</i>	5.916	-
Congressional Add: <i>Congressional Add: Program increase - operational upper stage augmentation kit</i>	9.860	-
Congressional Add Subtotals for Project: 628809	108.857	-
Congressional Add Totals for all Projects	138.930	-

Change Summary Explanation

FY 2025 increased compared to FY 2024 by \$38.8M due to the additional funding for Starfire Optical Range base operations support, correction of a known database error realigning funding from BA06 1206601SF, and USAF to USSF transfers for Enterprise Transformational Applied Research. This was coupled with a decrease in funding for completion of the resilient satellite navigation and reductions for re-prioritization to meet the nation's future security needs.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force Date: March 2024

Appropriation/Budget Activity
3620F: *Research, Development, Test & Evaluation, Space Force / BA 2: Applied Research*

R-1 Program Element (Number/Name)
PE 1206601SF / *Space Technology*

The increase in FY2025 from PB 2024 to PB 2025 of \$87.2M reflects additional funding for Starfire Optical Range base operations support (\$7.3M), USAF to USSF transfers for Enterprise Transformational Applied Research (\$9.2M), a correction of a known database error realigning funding from BA06 1206601SF (\$81.9M) and reductions for re-prioritization to meet the nation's future security needs(\$-11.2M).

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 2	R-1 Program Element (Number/Name) PE 1206601SF / <i>Space Technology</i>	Project (Number/Name) 620200 / <i>Enterprise Transformational Appld Research</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
620200: <i>Enterprise Transformational Appld Research</i>	-	0.000	0.000	9.193	0.000	9.193	7.014	7.015	7.015	7.014	Continuing	Continuing

Note
 This program, BA 2, PE 1206601SF, project , Explore, is a new start.
 This program, BA 2, PE 1206601SF, project , Seedlings for Disruptive Capabilities, is a new start.

A. Mission Description and Budget Item Justification

This project element develops multidisciplinary applied research efforts to accelerate the technology pipeline of transformational capabilities by reducing risk and maturing technologies so they can transition in support of larger advanced technology development capability investments. These activities are selected to enable solutions to the Department of the Air Force (DAF)s highest priorities. The Explore effort engages traditional & non-traditional industry, government laboratories, and academia through 12-24 month feasibility studies and demonstrations. The Seedlings for Disruptive Capabilities Program (SDCP) facilitates Air Force Research Laboratory (AFRL) cross-disciplinary applied research to provide leap-ahead, high risk technology development. Applied research efforts span a broad spectrum of activities, and established processes allow agility and flexibility to meet higher demand signals.

AFRL will plan and manage these funds at the enterprise level to achieve a high level of collaboration executed across all the applicable Technology Directorates and will apply the research toward disruptive capabilities. Building off the technology competencies and ecosystems of the Technology Directorates brings together the needed expertise and components to develop the transformational capabilities.

B. Accomplishments/Planned Programs (\$ in Millions)

Title: Explore	FY 2023	FY 2024		FY 2025
Description: Explore engages traditional & non-traditional industry, government labs and academia through competitive opportunity calls to incubate transformational Science and Technology (S&T). Its strategy-informed construct works to uncover game-changing and leap-ahead technologies that address DAF future force priorities. Explore's three-step process identifies, invests in, and matures these technologies through 12-24 month feasibility studies and proof-of-concept activities. The technology areas are identified through concept decomposition, technical horizon scanning, and broad competitive calls to the nation's best and brightest innovators in industry, academia, government, non-profits, and other non-traditional partners. Promising technologies are accelerated through aggressive, short-duration, applied research and development efforts. These efforts assess operational viability and demonstrate feasibility of transformational warfighter capabilities, including their associated business and use cases. To do this, a variety of approaches are used including modeling and simulation, military utility experimentation, exercise participation, technical analysis, technology/concept maturation, risk reduction activities, and subject matter expertise	-	0.000		3.500

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F / 2	R-1 Program Element (Number/Name) PE 1206601SF / <i>Space Technology</i>	Project (Number/Name) 620200 / <i>Enterprise Transformational Appld Research</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>input. Explore informs future areas of research and aids in identifying emerging technologies which could enable larger advanced technology development capability investments.</p> <p>FY 2024 Plans: Previously this work was accomplished under USAF Program Element 0602020F/ Future AF Capabilities Applied Research, Project 620200/Enterprise Transformational Appld Research and was transferred as part of the realignment to the Space Force Unique Science and Technology.</p> <p>FY 2025 Plans: Initiate efforts which support immediate space priorities of the DAF within building blue combat effects capabilities, countering adversary capabilities, supporting contested logistics, and command, control, and communications battle management</p> <p>Continue development of space technologies investment framework and identification of key space capability needs for the future force.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased compared to FY 2024 by 3.500M. Increase is a result of a transfer from USAF Program Element 0602020F/ Future AF Capabilities Applied Research, Project 620200/Enterprise Transformational Appld Research into this USSF Program Element 1206601SF/Space Technology, Project 620200/ Enterprise Transformational Appld Research.</p>				
<p>Title: Seedlings for Disruptive Capabilities</p> <p>Description: Integrates cross-enterprise multi-directorate space transformational applied research efforts to accelerate the pipeline of technology-enabled capability candidates pursuing the Department of the Air Force Operational Imperatives. Seedlings for Disruptive Capabilities solicit applied research to provide leap-ahead, high risk technology development. Significantly advances scientific progress of innovative concepts underpinning transformational operational capabilities to future forces, enhance organic AFRL research capabilities in an enterprise-level, cross-Directorate environment & fortify external research partnerships to leverage key emerging technology developments in academia, industry, and/or government laboratories. The Air Force Research Laboratory will plan and manage these research activities at the enterprise level with decentralized execution to achieve the intent of the strategy.</p> <p>FY 2024 Plans: Previously this work was accomplished under USAF Program Element 0602020F/ Future AF Capabilities Applied Research, Project 620200/Enterprise Transformational Appld Research and was transferred as part of the realignment to the Space Force Unique Science and Technology.</p> <p>FY 2025 Plans:</p>		-	0.000	5.693

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 2	R-1 Program Element (Number/Name) PE 1206601SF / <i>Space Technology</i>	Project (Number/Name) 620200 / <i>Enterprise Transformational Appld Research</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
Continue building infrastructure for trusted satellite autonomy that can enable quick reaction, planning and decision making in contested operations. <i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> FY 2025 increased compared to FY 2024 by 5.693M. Increase is a result of a transfer from USAF Program Element 0602020F/ Future AF Capabilities Applied Research, Project 620200/Enterprise Transformational Appld Research into this USSF Program Element 1206601SF/Space Technology, Project 620200/ Enterprise Transformational Appld Research.			
Accomplishments/Planned Programs Subtotals	-	0.000	9.193

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 2					R-1 Program Element (Number/Name) PE 1206601SF / <i>Space Technology</i>				Project (Number/Name) 621010 / <i>Space Survivability & Surveillance</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
621010: <i>Space Survivability & Surveillance</i>	-	56.399	41.591	42.502	0.000	42.502	38.900	41.603	42.743	43.640	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project develops technologies to understand and control the space environment for warfighter's future capabilities. The focus is on characterizing and forecasting the battlespace environment for more realistic space system design, modeling, and simulation, as well as the battlespace environment's effect on space systems' performance. This includes technologies to specify and forecast the space environment for planning operations, ensure uninterrupted system performance, optimize space-based surveillance operations, and provide capability to mitigate or exploit the space environment for both offensive and defensive operations.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Space Environment Research	19.443	15.591	23.725
Description: Develop techniques, forecasting tools, sensors, and technologies for specifying, monitoring, predicting, and controlling space environmental conditions hazardous to Department of Defense (DoD) operational space and radar systems.			
FY 2024 Plans: Continue support for North American Aerospace Defense Command (NORAD) Homeland Defense Modernization and Department of the Air Force (DAF) Arctic strategy. Develop and investigate representative and median regional space environment specifications intended for operational system simulation experiments. Extend and improve software radio techniques to monitoring and specifying space environment impacts. Utilize Artificial Intelligence (AI)/Machine Learning (ML) techniques. Improve efficiency of plasma generation systems. Support space experiments and demonstrations. Develop and enhance space environment modelling capabilities to better enable accurate specification and forecasting of the state of the space environment and the resulting impacts to Department of Defense and national systems. Extend advanced research into beyond-geosynchronous space environment impacts to national systems. Continue applied research of space environment interactions and effects for space situational awareness. Evaluate basic research in solar and space environment physics for transition to applied research efforts. Initiate exploratory work on space protection and exploitation technologies.			
FY 2025 Plans: Continue to expand and refine space environment modeling capabilities to facilitate precise specification and forecasting of the space environment's conditions and its implications on Department of Defense and national systems. Increase our ability to drive down granularity of space environment specification through increased space based environmental monitoring capabilities. Continue to increase support for the North American Aerospace Defense Command (NORAD) Homeland Defense Modernization and the techniques to enhance data analysis, decision-making processes, and improve our ability to understand faster, decide faster, and act faster in the Electromagnetic Operating Environment. Continue to develop plasma generation			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 2	R-1 Program Element (Number/Name) PE 1206601SF / <i>Space Technology</i>	Project (Number/Name) 621010 / <i>Space Survivability & Surveillance</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>systems for improved operational impacts. Provide comprehensive support for space experiments and demonstrations. Continue comprehensive research and analysis of the space environment to establish accurate regional environment specifications for effective operational system simulation experiments. Increase research efforts to investigate the impacts of the space environment beyond geosynchronous orbits on national systems. Continue to explore and study space environment interactions and effects to improve space domain awareness and technologies in operational environments including space and terrestrial sensor development. Continue to evaluate foundational research in solar and space environment physics to determine its suitability for application in practical research initiatives and exploratory work on developing technologies for space protection and exploitation. Complete space based environmental monitoring sensor development.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased compared to FY 2024 by \$8.134M due to increasing research in beyond geosynchronous orbits, support to NORAD, and the DAF arctic strategy. Funding was realigned into this thrust from BA06 1206601SF to correct known database error to accurately reflect actual costs of research performed and planned in this thrust.</p>			
<p>Title: Surveillance Technologies</p> <p>Description: Develop advanced target detection techniques, spectral signature libraries, and decision aids for space-based sensors and surveillance systems.</p> <p>FY 2024 Plans: In FY 2024 this thrust will be realigned to PE 1206601SF/Space Technology, Project 624846/Spacecraft Payload Technologies, and consolidated under one thrust titled Missile Warning and Tactical Sensing to better align projects under focused mission areas and in line with the USSF Space Systems Command (SSC) PEOs.</p> <p>FY 2025 Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: N/A</p>	8.973	0.000	0.000
<p>Title: Alternative Navigation Technologies</p> <p>Description: Develop new technologies based on cold atom physics and photonics that provide autonomous jam-proof precision inertial navigation to augment Global Positioning System (GPS) in case of GPS-denial. Develop atomic clocks and methods to disseminate time based on new technologies to replace legacy GPS atomic clocks and networks.</p> <p>FY 2024 Plans:</p>	12.978	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 2	R-1 Program Element (Number/Name) PE 1206601SF / <i>Space Technology</i>	Project (Number/Name) 621010 / <i>Space Survivability & Surveillance</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>In FY 2024 this thrust will be realigned to PE 1206601SF/Space Technology, Project 624846/Spacecraft Payload Technologies and consolidated under one thrust titled Space Communication/Positioning, Navigation, & Timing (PNT) Technologies to better align projects in line with the USSF SSC PEO's mission areas.</p> <p>FY 2025 Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: N/A</p>			
<p>Title: Strategic Radiation Hardened Electronics</p> <p>Description: Design, develop, produce and qualify strategic radiation hardened (SRH) non-volatile memory (NVM) that does not exist today and is suitable to support DoD strategic missile, missile defense, and space system needs and to address a more diverse & advanced nuclear threat.</p> <p>FY 2024 Plans: Finalize concept design for SRH NVM to address the electrical and radiation performance requirements identified in FY 2023. Continue plan for fabrication, test and evaluation of test articles to mitigate emerging radiation effects in electronics. Initiate the technical development of the sub-scale test chip and continue efforts to develop a space qualification strategy. Continue efforts to ensure durability of a domestic source of readout integrated circuits (ROIC) and focal plane array (FPA) technologies. Continue efforts to enable maturation of large format high-dynamic range FPAs. Initiate feasibility assessment to port radiation hardened ROIC technology from current State-of-the-Art to a more advanced processing node.</p> <p>FY 2025 Plans: Continue development of SRH NVM to address the electrical and radiation performance requirements gap identified in Strategic Radiation Hardened Electronics Council's (SRHEC) Program Needs Report #4. Complete Design Review (DR) for up to two vendors, initiate down select to 1 vendor that will proceed to further mature the technology. During down select phase, begin initial fabrication of sub-scale test articles and evaluation of test chips to reduce program risk and ensure the full-scale prototype is on track to meet radiation and performance requirements, then produce a space qualification strategy. Continue efforts to ensure durability of a domestic source of readout integrated circuits (ROIC) and focal plane array (FPA) technologies. Continue efforts to enable maturation of large format, high- dynamic range FPAs. Continue feasibility assessment to port radiation hardened ROIC technology from current State-of-the-Art to a more advanced processing node.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased compared to FY 2024 by \$7.223M due to downselect to one vendor for SRH NVM.</p>	15.005	26.000	18.777
Accomplishments/Planned Programs Subtotals	56.399	41.591	42.502

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force Date: March 2024

Appropriation/Budget Activity 3620F / 2	R-1 Program Element (Number/Name) PE 1206601SF / <i>Space Technology</i>	Project (Number/Name) 621010 / <i>Space Survivability & Surveillance</i>
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C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 2					R-1 Program Element (Number/Name) PE 1206601SF / <i>Space Technology</i>				Project (Number/Name) 624846 / <i>Spacecraft Payload Technologies</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
624846: <i>Spacecraft Payload Technologies</i>	-	61.582	71.286	43.953	0.000	43.953	45.773	47.625	49.094	50.123	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project develops advanced technologies that enhance spacecraft payload operations by improving materials/component, networking, analysis tools, and subsystem capabilities. The project focuses on development of advanced space data generation and exploitation technologies, including infrared sensors; and development of high-fidelity space simulation models that support space-based surveillance and space asset protection research and development for the warfighter.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
<p>Title: Space-Based Detector Technologies</p> <p>Description: Develop advanced infrared device technologies that enable hardened space detector arrays with improved detection to perform acquisition, tracking, and discrimination of space objects and missile warning.</p> <p>FY 2024 Plans: In FY 2024 this thrust is consolidated under one thrust titled Missile Warning and Tactical Sensing to better align with the USSF Space Systems Command (SSC) PEO's mission areas.</p> <p>FY 2025 Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: N/A</p>	4.032	0.000	0.000
<p>Title: Missile Warning and Tactical Sensing</p> <p>Description: Develop advanced infrared device technologies that enable hardened space detector arrays with improved detection to perform acquisition, tracking, and discrimination of space objects and missile warning. Develop advanced target detection techniques, spectral signature libraries, and decision aids for space-based sensors and surveillance systems.</p> <p>FY 2024 Plans: Complete performance characterization of High Dynamic Range (HDR) resilient 10um pitch Focal Plane Array (FPA) series. Results will be rolled into full large format FPA build. Continue developing a more thorough understanding of noise sources in smaller Complementary Metal Oxide Semiconductor (CMOS) mixed signal nodes which are vital to success of HDR FPA program. Continue involvement in Event Based Sensor (EBS) development and assist in defining DoD and IC path forward. Evaluate the performance of test chips as they become available, as part of the AFRL collaboration with the Defense Advanced Research</p>	0.000	8.076	15.553

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 2	R-1 Program Element (Number/Name) PE 1206601SF / <i>Space Technology</i>	Project (Number/Name) 624846 / <i>Spacecraft Payload Technologies</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Projects Agency (DARPA). Continue the development of next generation infrared detector materials that have the potential of offering higher performance.</p> <p>Continue development of novel sensing concepts for space-based surveillance and detection of challenging, evolving strategic and tactical targets in contested environments. Initiate development and design of space-based sensors for resilient target custody by proliferated space architectures. Continue development of data analytics for edge processing, cloud solutions, and human-machine learning to shorten sensor-to-shooter timelines. Initiate development of trusted artificial intelligence and machine learning models for autonomous classification and moving target indication of ground vehicles, air platforms, and maritime vessels for battlefield operations. Initiate study of sensing systems optimized for space-based autonomous tasking and moving target indication from multiple target surveillance and tracking layers of a hybrid space architecture. Continue study and development of autonomous sensing strategies and technologies for multi-domain target acquisition and tracking by networked satellite constellations.</p> <p>FY 2025 Plans: Initiate testing of noise properties of smaller mixed signal nodes. Initiate identification of transition opportunities for Event Based Sensors (EBS) based on results from FY 2024 testing. Continue development of next generation infrared detector materials that have the potential of offering higher performance. Continue build of focal plane arrays using novel detector material and obtain statistically significant performance characterization data product.</p> <p>Continue development of novel sensing concepts for space-based moving target engagement at scale in time sensitive, highly contested environments. Initiate design and laboratory testing of concepts for space-based sensing payloads. Continue development and design of space-based sensors for resilient target custody by target tracking space architectures. Continue development of data analytics and data mobility solutions for edge processing, information networking, and human-machine learning in support of tactical sensing and targeting. Continue development of trusted artificial intelligence and machine learning models for autonomous classification and identification of moving targets in support of multi-domain battlefield operations. Continue study of sensing system networking optimized for space-based autonomous tasking and moving target indication from multi-tiered hybrid space architectures.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased compared to FY 2024 by \$7.477M due to design and laboratory testing of concepts for space-based sensing payloads. Funding was realigned into this thrust from BA06 1206601SF to correct known database error to accurately reflect actual costs of research performed and planned in this thrust.</p>			
<p>Title: Space Electronics Research</p> <p>Description: Develop technologies for space-based payload components such as radiation-hardened electronic devices, microelectro-mechanical system devices, and advanced electronics packaging.</p>	5.683	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F / 2	R-1 Program Element (Number/Name) PE 1206601SF / <i>Space Technology</i>	Project (Number/Name) 624846 / <i>Spacecraft Payload Technologies</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>FY 2024 Plans: In FY 2024 this thrust is realigned to PE 1206601SF/Space Technology, Project 628809/Spacecraft Vehicle Technologies and consolidated under one thrust, titled Spacecraft Component Technologies to better align efforts with the USSF SSC PEO's mission areas.</p> <p>FY 2025 Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: N/A</p>				
<p>Title: Modeling and Simulation Tools for Space Applications</p> <p>Description: Provide modeling, simulation, and analysis for technology evolution in space-based terrestrial surveillance systems, precision navigation and timing, space situational awareness, satellite communications, space environment monitoring, and space control payloads.</p> <p>FY 2024 Plans: In FY 2024 this thrust is transferred to Program Element 1206616SF/Space Advanced Technology Development/Demo, Project 633834/Integrated Space Technology Demonstrations, to better align efforts with the USSF SSC PEO's mission areas.</p> <p>FY 2025 Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: N/A</p>		3.752	0.000	0.000
<p>Title: Alternative Positioning, Navigation, and Timing Technology</p> <p>Description: Identify and develop technologies that enable new, or enhance existing, United States positioning, navigation, and timing (PNT) satellite capabilities by increasing resiliency and availability of accuracy, and/or increasing the affordability of providing current capabilities. Develop technologies to meet identified Air Force Space Command/Space and Missile Systems Center positioning, navigation, and timing space payload technology needs.</p> <p>FY 2024 Plans: In FY 2024 this thrust is consolidated under one thrust titled Space Communication/PNT Technologies to better align efforts with the USSF Space Systems Command (SSC) PEO's mission areas.</p> <p>FY 2025 Plans:</p>		7.315	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F / 2	R-1 Program Element (Number/Name) PE 1206601SF / <i>Space Technology</i>	Project (Number/Name) 624846 / <i>Spacecraft Payload Technologies</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
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N/A			
FY 2024 to FY 2025 Increase/Decrease Statement:			
N/A			

Title: Space Communication/ Positioning, Navigation & Timing Technologies	0.000	13.210	28.400
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Description: Identify and develop technologies that enable new, or enhance existing, United States communication, positioning, navigation, and timing satellite capabilities. Technology solutions should improve performance, increase robustness and/or resilience, and/or increase the affordability of providing current capabilities. Develop technologies to meet identified US Space Command/Space Systems Command communication, positioning, navigation, and timing space payload technology needs. Develop new technologies based on cold atom physics and photonics that provide autonomous jam-proof precision inertial navigation to augment Global Positioning System (GPS) in case of Global Positioning System-denial. Develop atomic clocks and methods to disseminate time based on new technologies to replace legacy Global Positioning System atomic clocks and networks.

FY 2024 Plans:
Continue scientific research and technology development for space communications exploring W/V-band spectrum options. Continue to support field demonstrations and on-orbit experiments to examine the interaction of communication, position, navigation and timing signals between the multi-layer, multi-function architectures in contested environments and exercise potential Concept of Operations (CONOPs). Continue development of the enabling technologies to increase Timing precision, enable transition to proliferated low earth orbit constellation, and provide increased options for the user. Continue to support Quantum Rim of the Pacific (RIMPAC) exercise and other opportunities to accelerate the fielding of Quantum-based technologies. Continue laboratory development of Quantum-based technologies and component miniaturization efforts.

FY 2025 Plans:
Initiate development of low probability of intersect and low probably of detection (LPI/LPD), high bandwidth, multi-domain communications for contested and denied environments to include GPS-free Positioning, Navigation, & Timing (PNT) dissemination. Develop lasercom interoperability laboratory capabilities (both indoor and outdoor). Explore research and development of Artificial Intelligence/Machine Learning (AI/ML) enhancements to PNT architecture to reduce the time required to react to a PNT-based threat. Continue to support field demonstrations and on-orbit experiments to examine the interaction of communication, position, navigation, and timing signals between the multi-layer, multi-function architectures in contested environments and exercise potential Concept of Operations.

Continue to develop enabling technologies and demonstration units to enhance the transition path for advanced clocks and time dissemination. Continue to explore and utilize opportunities to accelerate the fielding of quantum-based technologies and testing in relevant environments. Continue collaboration with international partners in the development of Quantum-based technologies

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F / 2	R-1 Program Element (Number/Name) PE 1206601SF / <i>Space Technology</i>	Project (Number/Name) 624846 / <i>Spacecraft Payload Technologies</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>to leverage allied funding and capabilities and ensure US leadership in these areas. Continue lab development of quantum-based technologies and component miniaturization efforts. Complete Quantum Rim of the Pacific (RIMPAC) exercise support.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased compared to FY 2024 by \$15.190M due to initiating development of multi-domain communications for contested and denied environments and Artificial Intelligence/Machine Learning (AI/ML) enhancements to PNT architecture. Funding was realigned into this thrust from BA06 1206601SF to correct known database error to accurately reflect actual costs of research performed and planned in this thrust.</p>			
<p>Title: Resilient Satellite Navigation</p> <p>Description: *Formerly Resilient Positioning, Navigation, and Timing Solutions</p> <p>Advance and evaluate technologies contributing diversity to satellite positioning, navigation and timing (PNT) information delivery, creating models of performance, scalability and resiliency needed to anchor USSF's Space Warfighting Analysis Center (SWAC) Force Design analytics. Pursue signals and user equipment concepts targeting low size, weight and power (SWAP) users. Promote and characterize commercial PNT capabilities potentially suitable for DoD use. Conduct laboratory and on-orbit experimentation to capture representative integrated system performance and feed back key parameters to SWAC analyses and forward into future requirements definition.</p> <p>FY 2024 Plans: Complete development of reprogrammable user equipment silicon. Continue signals and hardware/software-in-the-loop (HIL/SIL) development toward on-orbit demonstration of reprogrammable PNT signal broadcast to low-SWAP user equipment to assess resiliency, performance and scalability. Conduct modeling and simulation of planned field experiments utilizing testbed assets to predict end-to-end PNT performance in contested electromagnetic environment. Feed initial findings back to inform SWAC PNT Force Design model.</p> <p>FY 2025 Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased compared to FY 2024 by \$50.000M due to completion of the specific planned resilient satellite navigation S&T efforts to feed future SWAC force design. This effort was planned and funded for 2 years FY 2023-FY 2024.</p>	40.800	50.000	0.000
Accomplishments/Planned Programs Subtotals	61.582	71.286	43.953

C. Other Program Funding Summary (\$ in Millions) N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 2	R-1 Program Element (Number/Name) PE 1206601SF / <i>Space Technology</i>	Project (Number/Name) 624846 / <i>Spacecraft Payload Technologies</i>

C. Other Program Funding Summary (\$ in Millions)

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 2					R-1 Program Element (Number/Name) PE 1206601SF / <i>Space Technology</i>				Project (Number/Name) 624847 / <i>Rocket Propulsion Technology</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
624847: <i>Rocket Propulsion Technology</i>	-	15.511	14.483	28.214	0.000	28.214	29.099	30.071	30.994	31.643	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project develops and demonstrates rocket propulsion technologies for space access and space maneuver. Analytical and experimental areas of emphasis are propellants, propellant management, combustion, rocket material applications, and innovative space access and in space propulsion concepts. Technologies of interest will improve reliability, performance, survivability, affordability, and environmental compatibility of these systems. Develop technologies to reduce the weight and cost of components using new materials and improved designs and manufacturing techniques. All efforts in this project contribute to the sustainment and growth of the space and rocket propulsion industry, providing space access and in space propulsion technology for the entire Department of Defense (DoD). Technologies under this project enable capabilities of interest to DoD, National Aeronautics and Space Administration (NASA) and growing Space community. Tasks include: proof of concept tests of critical components; advanced component development; and ground-based tests. This project develops next generation of physics-based modeling, simulation, and analysis (MS&A) tools for rapid and agile space access and in-space propulsion design, analysis, and production, as well as the digital engineering concepts to manage the entire process of design, test, and validation of space access and in-space systems. All thrusts are reviewed by a DoD level steering committee yearly for relevance to DoD missions, and the associated support costs.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Rocket Combustion Technologies	4.474	6.123	12.146
Description: Develop and demonstrate advanced combustion technology for significantly improved performance, while preserving chamber lifetime and reliability. This effort includes design testing of materials and systems and supports investigation into environments/ processes to improve efficiency, effectiveness, suitability, and interoperability of space access technologies. Leveraging commercial investments to develop this technology.			
FY 2024 Plans: Continue the employment of new fuel and material operating limitations, manufacturing processes, and launch goals in cycle analysis to identify trade space for future engines. Continue to develop and evaluate advanced material solutions for high temperature components in rocket propulsion. Continue development and payoff determination of rotating detonation rocket engine technologies. Initiate technologies and material studies supporting rapid launch capabilities emphasizing digital design capabilities.			
FY 2025 Plans: Continue the employment of new fuel and material operating limitations, manufacturing processes, and launch goals in cycle analysis to identify trade space for future engines. Continue to develop, demonstrate, and evaluate advanced material solutions for high temperature components in rocket propulsion. Continue development and payoff determination of rotating detonation			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F / 2	R-1 Program Element (Number/Name) PE 1206601SF / <i>Space Technology</i>	Project (Number/Name) 624847 / <i>Rocket Propulsion Technology</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
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rocket engine technologies. Continue technologies and material studies supporting rapid launch capabilities emphasizing digital design capabilities.

FY 2024 to FY 2025 Increase/Decrease Statement:

FY2025 increased compared to FY2024 by \$6.023M. \$0.358M of the increase is due to acceleration of digital design capabilities work and the remainder \$5.665M is due to transfer from BA06 PE 1206601SF to correct known database error from stand up of the Space Force in FY22 to accurately reflect actual costs of research performed and planned in this thrust.

Title: Applied Space Access Technologies

Description: Develop technologies for improved performance, while increasing life and reliability needs for engine uses in expendable and reusable launch vehicles. This effort also develops propulsion technologies that improve readiness, mobility, and responsive capabilities of space access methods and systems.

FY 2024 Plans:

Continue sub-scale risk mitigation and technology maturation activities to incorporate into next generation engine concepts. Continue modular component integration and interaction research activities supporting next generation engine concepts and operational capabilities. Initiate technologies and processes supporting modeling and analysis for rapid launch capabilities.

FY 2025 Plans:

Continue sub-scale risk mitigation and technology maturation activities to incorporate into next generation engine concepts. Continue modular component integration and interaction research activities supporting next generation engine concepts and operational capabilities. Continue technologies and processes supporting modeling and analysis for rapid launch capabilities.

FY 2024 to FY 2025 Increase/Decrease Statement:

FY2025 increased compared to FY2024 by 2.724M. -0.320M decreased due to higher national security priorities and the 3.044M is due to transfer from Program Element 1206601SF/Space Technology, Project 628809/Spacecraft Vehicle Technologies to correct known database error from stand up of the Space Force in FY22 to accurately reflect actual costs of research performed and planned in this thrust.

Title: On-Orbit Propulsion Technologies

Description: Develop electric, chemical, and advanced propulsion technologies for station-keeping, repositioning, and orbit transfer for satellites and satellite constellations. This effort develops technologies for flexible, responsive in-space maneuver in all orbit regimes. Develop technologies critical to expanding Space Force's capacity to maneuver, and project power throughout space.

FY 2024 Plans:

	FY 2023	FY 2024	FY 2025
	2.403	3.290	6.013
	3.704	5.070	10.055

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F / 2	R-1 Program Element (Number/Name) PE 1206601SF / <i>Space Technology</i>	Project (Number/Name) 624847 / <i>Rocket Propulsion Technology</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Continue advanced chemical propellants development focusing on flight-weight systems to assist in transition to industry partners. Continue to support the maturation of advanced diagnostics for both chemical and electric propulsion thruster plumes with potential for integrated state-of-health application. Continue to expand the validation and verification programs (both experimental and flight) to quantify accuracy of modeling and simulation tools developed to support thruster-spacecraft integration. Continue transition and support of thruster/plume modeling framework to spacecraft industry to propulsion community. Continue expanding exploration of advanced integrated electric propulsion and chemical thruster concepts and assess new spacecraft propulsion requirements.</p> <p>FY 2025 Plans: Continue advanced chemical propellants development focusing on flight-weight systems to assist in transition to industry partners. Continue to support the maturation of advanced diagnostics for both chemical and electric propulsion thruster plumes with potential for integrated state-of-health application. Continue to expand the validation and verification programs (both experimental and flight) to quantify accuracy of modeling and simulation tools developed to support thruster-spacecraft integration. Continue transition and support of thruster/plume modeling framework to spacecraft industry to propulsion community. Continue expanding exploration of advanced integrated electric propulsion and chemical thruster concepts and assess new spacecraft propulsion requirements.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY2025 increased compared to FY2024 by 3.044M. 0.295M of the increase is due to cost of raw materials and fuels and the remainder 2.749M is due to transfer from Program Element 1206601SF/Space Technology, Project 628809/Spacecraft Vehicle Technologies to correct known database error from stand up of the Space Force in FY22 to accurately reflect actual costs of research performed and planned in this thrust.</p>			
Accomplishments/Planned Programs Subtotals	10.581	14.483	28.214

	FY 2023	FY 2024
Congressional Add: Propulsion Technology	4.930	-
FY 2023 Accomplishments: Conduct Congressionally directed efforts.		
Congressional Adds Subtotals	4.930	-

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 2					R-1 Program Element (Number/Name) PE 1206601SF / <i>Space Technology</i>				Project (Number/Name) 624866 / <i>Lasers & Imaging Technology</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
624866: <i>Lasers & Imaging Technology</i>	-	31.318	19.985	30.298	0.000	30.298	31.629	33.114	32.097	32.768	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project conducts research advancing ground-based optical space domain awareness, techniques to counter laser threats to space craft, and laser applications towards ground-to-space communication.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
<p>Title: Electro-Optic Space Domain Awareness and Satellite Security</p> <p>Description: Develop advanced, long-range, electro-optical technologies that enable ground-based optical Space Domain Awareness (SDA) and quantum-based optical communications. Develop and use technologies to quantitatively assess the vulnerability of blue satellite systems and components to lasers and other-directed energy sources. Operate the Starfire Optical Range (SOR) to conduct research meeting internal and customer requirements.</p> <p>FY 2024 Plans: Continue research and development (R&D) of laser-enabled real-time space domain awareness (SDA) focused on imaging of satellites when in Earth's shadow. When demonstrated, transition this capability to Space Operations Command (SPoC)/DEL2/Det2. Continue to mature component technologies for 24/7 optical and infrared imaging of near-earth and geosynchronous objects enabling characterization of tactical timelines, especially technology enabling detection of small-sats in very close proximity to large high-value space assets. Continue investigation through measurement, modeling, and simulation of the susceptibility of satellite components to laser and other-directed energy threats to inform practical designs for protective equipment and for employing protection methods on tactically rapid timelines. When demonstrated, transition to Space Systems Command (SSC) the simulation tools necessary to enable laser-satellite deconfliction. Continue to mature daylight detection of satellites enabling custody and imaging through daytime hours when satellites cannot normally be detected by ground-based optical systems. Continue development of laser-enabled options for ranging to geosynchronous satellites from apertures smaller than 3 meters and development of laser-enabled options for characterizing near-geosynchronous satellites. Continue development of long-range secure optical network technology leveraging quantum science, especially for free space laser communication channels during daylight. Continue to apply machine-learning to automatically identify geosynchronous orbit objects more accurately and rapidly than current "hard-wired" algorithms. Conduct research into maintaining custody of space craft in three-body-gravitational pseudo-orbits, such as in cis-lunar space and Earth-Sun equilibrium zones. Continue to maintain the Starfire Optical Range (SOR) facilities and experimental equipment in a mission-ready state for both R&D and for use by Space Operations Command (SPoC)/DEL2/Det2.</p> <p>FY 2025 Plans:</p>	31.318	19.985	30.298

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 2	R-1 Program Element (Number/Name) PE 1206601SF / <i>Space Technology</i>	Project (Number/Name) 624866 / <i>Lasers & Imaging Technology</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Complete research and development (R&D) of laser-enabled real-time space domain awareness (SDA) focused on imaging of satellites when in Earth's shadow. Transition this capability to Space Operations Command (SPoC)/DEL2/Det2. Continue to mature component technologies for 24/7 optical and infrared imaging of near-earth and geosynchronous objects enabling characterization of tactical timelines, especially technology enabling detection of small satellites in very close proximity to large high-value space assets. Continue investigation through measurement, modeling, and simulation of the susceptibility of satellite components to laser and other-directed energy threats to inform practical designs for protective equipment and for employing protection methods on tactically relevant timelines. When demonstrated, transition to Space Systems Command (SSC) the simulation tools necessary to enable laser-satellite deconfliction. Continue to mature daylight detection of satellites enabling custody and imaging through daytime hours when satellites cannot normally be detected by ground-based optical systems. Continue development of laser-enabled options for ranging to geosynchronous satellites from apertures smaller than 3 meters and development of laser-enabled options for characterizing near-geosynchronous satellites. Continue development of long-range secure optical network technology leveraging quantum science, especially for free space laser communication channels during daylight. Complete efforts to train artificial intelligence to identify space objects in non-imaging observations, such as spectra and speckle. Continue development of artificial intelligence to estimate the position and orientation of uncooperative space objects. Continue research into maintaining custody of space craft in three-body-gravitational pseudo-orbits from ground-based measurements, such as in cis-lunar space and Earth-Sun equilibrium zones. Continue to maintain the Starfire Optical Range (SOR) facilities and experimental equipment in a mission-ready state for both R&D and for use by Space Operations Command (SPoC)/DEL2/Det2.</p> <p><i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> Increase from FY 2024 to FY 2025 of \$10.313 million to fund necessary base operations support and civilian pay realignment from Air Force to Space Force.</p>			
Accomplishments/Planned Programs Subtotals	31.318	19.985	30.298

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 2					R-1 Program Element (Number/Name) PE 1206601SF / <i>Space Technology</i>				Project (Number/Name) 625018 / <i>Spacecraft Protection Technology</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
625018: <i>Spacecraft Protection Technology</i>	-	33.727	32.345	42.834	0.000	42.834	49.936	56.553	57.929	59.141	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project develops the technologies to perform faster, well-informed decision making for space operations, enhanced mission assurance of critical space services, and integrate space with joint operational picture for protecting United States space assets, in potentially hostile environments, to assure continued space system operation. The project provides transitionable technology and knowledge to enable speed-of-light protection, many-on-many engagement and defense, and new orbit regimes despite growing threat impunity. This project also encompasses efforts to expand the University Consortium for Space Research to address research needs unique to the USSF.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Space Control	8.584	20.345	26.414
Description: Provide timely, well-informed decisions enabled by space situational awareness in the cislunar environment, analytic tools powered by modern techniques and practices, trusted autonomy in both ground and on-orbit systems, and an underlying resilience to cyber and electronic warfare threats.			
FY 2024 Plans: Continue to develop techniques to detect, identify, track, characterize, and catalog satellites using multi-phenomenology techniques with particular focus on space situational awareness in the cislunar environment; provide technical expertise towards flight experiments that will demonstrate utility of cislunar situational awareness for establishing and transferring custody, tracking, and deterring threats from deep space. Continue studies to inform potential upgrades to operational tools used in space situational awareness. Continue development of on-orbit threat warning sensing and assessment with emphasis on spectrum awareness and inherent, on-board satellite sensors. Continue research on cyber vulnerability and cyber hardening methods of space assets with laboratory testbeds; developing standards and techniques. Continue collaboration and demonstration of cyber hardening techniques aboard on-orbit experiments through established transitional pipeline of flight experiments; growing pipeline for future demonstrations. Continue to develop on-board autonomous satellite technologies, emphasizing operational resilience for tactical action, awareness across operator, ground and space interfaces, enabling tactical awareness for distributed system elements, defining success criteria for many-to-many engagements; plan for next generation flight experiments. Continue experimentation and exercises with DoD ground architectures, operations centers, commercial and international partners.			
FY 2025 Plans: Continue to develop techniques to detect, identify, track, characterize, and catalog satellites using multi-phenomenology techniques with particular focus on space situational awareness in the cislunar environment; provide technical expertise towards flight experiments that will demonstrate utility of cislunar situational awareness for establishing and transferring custody, tracking,			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 2	R-1 Program Element (Number/Name) PE 1206601SF / <i>Space Technology</i>	Project (Number/Name) 625018 / <i>Spacecraft Protection Technology</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>and deterring threats from deep space. Continue studies to inform potential upgrades to operational tools used in space situational awareness. Continue development of on-orbit threat warning sensing and assessment with emphasis on spectrum awareness and inherent, on-board satellite sensors. Continue research on cyber vulnerability and cyber hardening methods of space assets with laboratory testbeds, developing standards and techniques. Continue collaboration and demonstration of cyber hardening techniques aboard on-orbit experiments through established transitional pipeline of flight experiments, growing pipeline for future demonstrations. Continue to develop on-board autonomous satellite technologies, emphasizing operational resilience for tactical action, awareness across operator, ground and space interfaces, enabling tactical awareness for distributed system elements, defining success criteria for many-to-many engagements, plan for next generation flight experiments. Continue experimentation and exercises with DoD ground architectures, operations centers, commercial and international partners. Initiate studies, assessments, and engineering trades to support spectrum resilience via radio frequency sensing to support multi-satellite, multi-domain spectrum dominance. Complete integration and testing of multiple cyber resilience, reactive protection, and autonomous sensing capabilities into on-orbit demonstrations and initiate on-orbit experimentation with those capabilities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased compared to FY 2024 by \$6.069M due to expanding technical research in the areas of spectrum resilience, multi-domain spectrum dominance and autonomous sensing to initiate on-orbit experimentation.</p>			
<p>Title: University Consortium for Space Research</p> <p>Description: Expand the University Consortium for Space Research to address research needs unique to the USSF. Create Technology Institutes at universities focused on developing and delivering technology for critical USSF missions. Support development of the future space workforce. Build capacity for space research within higher education institutions. Accelerates the transition of fundamental research and early-stage technology development into integrated systems capable of aiding the national security space enterprise. The objective is to create key technology breakthroughs for USSF through Space Strategic Technology Institutes (SSTIs). The goal for each SSTI is to transition fundamental research and early-stage tech development into transformational research and technology development and demonstration capabilities within the space domain. Supports research, development, and demonstration; and educates and trains students for the future national security space workforce. Annual calls for specific technology areas will result in one or multiple contract awards.</p> <p>FY 2024 Plans: Expand the number of Technology Institutes, provide programming that builds capacity for space research in higher education including a focus on minority serving institutions.</p> <p>FY 2025 Plans: Continue to expand the number of Technology Institutes to be comprised of network of universities, non-profits and industry partnerships with a high emphasis to include workforce development and research areas, prioritized under USSF challenges.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement:</p>	0.000	12.000	16.420

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F / 2	R-1 Program Element (Number/Name) PE 1206601SF / <i>Space Technology</i>	Project (Number/Name) 625018 / <i>Spacecraft Protection Technology</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
FY 2025 increased compared to FY 2024 by \$4.420M due to the continued expansion of the University Consortium for Space, to include increasing the number of Technology Institutes through multiple awards for future SSTI calls comprising of at least three new research institutions, collaborating with other universities and industry to address space research, development and demonstration needs.			
Accomplishments/Planned Programs Subtotals	8.584	32.345	42.834

	FY 2023	FY 2024
Congressional Add: Congressional Add: Program increase - ground-based interferometry <i>FY 2023 Accomplishments:</i> Conduct Congressionally directed effort.	1.972	-
Congressional Add: Congressional Add: Program Increase - digital engineering and modeling for space domain awareness <i>FY 2023 Accomplishments:</i> Conduct Congressionally directed effort.	9.367	-
Congressional Add: Congressional Add: Program Increase - lunar surface space domain awareness <i>FY 2023 Accomplishments:</i> Conduct Congressionally directed effort.	3.944	-
Congressional Add: Congressional Add: Program Increase - SOSA-based spacecraft protection technology <i>FY 2023 Accomplishments:</i> Conduct Congressionally directed effort.	9.860	-
Congressional Adds Subtotals	25.143	-

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 2					R-1 Program Element (Number/Name) PE 1206601SF / <i>Space Technology</i>				Project (Number/Name) 628809 / <i>Spacecraft Vehicle Technologies</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
628809: <i>Spacecraft Vehicle Technologies</i>	-	156.637	26.506	47.970	0.000	47.970	48.952	51.431	52.778	53.884	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project is a pervasive portfolio pursuing a broad range of emerging technologies targeted for application and insertion in the future national space architecture. The project focuses on spacecraft components including, structures, power, thermal management, electronics, and robotics/logistics modules. Leap-ahead capability is provided utilizing in-house expertise and laboratories, and by leveraging the creativity and innovation of the Nation's industry, universities, and national laboratories to conduct applied research. The project maintains core competencies in astrodynamics, controls, electronics, materials, power, structures, and thermal, and provides foundational technologies supporting all space mission areas.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
<p>Title: Space Power/Thermal Research</p> <p>Description: Develop technologies for advanced space platform subsystems such as compact, high efficiency solar power cells and arrays, and innovative power generation concepts.</p> <p>FY 2024 Plans: In FY 2024 this thrust will be consolidated under one thrust titled Spacecraft Component Technologies to better align efforts with the USSF SSC PEO's mission areas.</p> <p>FY 2025 Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: N/A</p>	9.963	0.000	0.000
<p>Title: Space Structures and Controls Research</p> <p>Description: Develop revolutionary and enabling technologies, including lighter weight, lower cost, high performance structures for space platforms; guidance, navigation, and controls hardware and software for next generation of space superiority systems.</p> <p>FY 2024 Plans: In FY 2024 this thrust with associated funding is consolidated under one thrust titled Spacecraft Component Technologies to better align efforts with the USSF SSC PEO's mission areas.</p> <p>FY 2025 Plans:</p>	14.424	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 2	R-1 Program Element (Number/Name) PE 1206601SF / <i>Space Technology</i>	Project (Number/Name) 628809 / <i>Spacecraft Vehicle Technologies</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
N/A			
<i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> N/A			
<p>Title: Spacecraft Component Technologies</p> <p>Description: Develop technology and research initiatives executed through continuous cycles of development, maturation, and assessment of component technologies. Develop revolutionary and enabling technologies including: lighter weight, lower cost, high-performance structures and thermal systems for space platforms; compact, high-efficiency solar power cells and arrays, and innovative power-generation concepts; radiation-hardened electronic devices; microelectro-mechanical system devices; advanced electronics packaging; guidance, navigation, and controls hardware and software; refueling and logistics module upgrade; on-orbit assembly; and high degree of freedom robotics. Due to the pervasive nature of the project, many of the developed components support DoD missions in the terrestrial domain in addition to their primary space mission.</p> <p>FY 2024 Plans: Continue development of high power arrays and storage capability for small satellites including solar array structures scalable to all missions with specific power greater than 100 Watts per kilogram. Transition compact telescoping array to industry and initiate new efforts pushing toward landmark 40% efficiency solar cells. Transition initial development of directed energy protection capabilities for proliferated low Earth orbit constellations and next generation USSF satellite buses. Complete exploration of alternative power generation sources, such as nuclear to characterize the limitations and challenges underpinning operating space systems in non-traditional orbital regimes. Initiate technology development required for alternative power generation sources and next-generation USSF satellite buses. Transition research to enable high-pulsed power systems including generation, storage, and heat rejection technologies for small satellites. Continue research efforts in high-performance, resilient small satellite technologies and development efforts in deployable structures, metrology, power and thermal management for tactical intelligence, surveillance, and reconnaissance missions in contested environments.</p> <p>FY 2025 Plans: Continue to develop high-power resilient satellite technology, including deployable solar arrays scalable to all missions. Transition modular self-stiffening array to industry. Continue efforts for landmark 40% efficiency solar cells and develop alternative power generation and storage sources. Complete tech maturation of robotic test capabilities for high-fidelity ground testing of microgravity deployment and 3-dimensional attitude control systems testing. Continue transitioning research enabling space logistics concepts including autonomous rendezvous, proximity operations, and docking; guidance and navigation algorithms for novel orbits; scalable autonomy and multi-agent behavior; and high degrees of freedom robotics for spacecraft operations including on-orbit refueling, spacecraft upgrade, assembly, and manufacturing. Continue development for functional materials, metrology, power and thermal management for space-based sensing missions in contested environments.</p>	0.000	26.506	47.970

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 2	R-1 Program Element (Number/Name) PE 1206601SF / <i>Space Technology</i>	Project (Number/Name) 628809 / <i>Spacecraft Vehicle Technologies</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Continue leadership role in OUSD(R&E) Trusted and Assured Microelectronics program executing the research, development and transition of radiation hardened electronic components to support National Security Space and Strategic systems. Continue adapting bench-marking capabilities on new electronics using the latest spacecraft algorithms and transitioning bench-marking capabilities and results to the acquisition community to enable data-informed payload architecture design decisions. Continue development of strategic radiation hardened microprocessor. Continue research and development on reliable application of high-performance commercial-based processing in future space systems to enable revolutionary on-orbit edge processing, autonomy, data fusion, and machine learning. Continue research into heterogeneous on-orbit processing capabilities in support of future on-orbit servicing objectives. Initiate effort on Hyper-Converged edge computing for space systems.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased compared to FY 2024 by \$21.464M due to initiating effort on Hyper-Converged edge computing for space systems and applying resources to research on reliable application of high-performance commercial-based processing in future space systems. Funding was realigned into this thrust from BA06 1206601SF to correct known database error to accurately reflect actual costs of research performed and planned in this thrust.</p>			
<p>Title: Space Experiments</p> <p>Description: Develop flight experiments to improve the capabilities of existing operational space systems and to enable new transformational space capabilities.</p> <p>FY 2024 Plans: In FY 2024 this thrust is transferred to Program Element 1206616SF/Space Advanced Technology Development/Demo, Project 633834/Integrated Space Technology Demonstrations and consolidated into the Integrated Satellite Demonstrations thrust to better align efforts with the USSF Space Systems Command (SSC) PEO's mission areas.</p> <p>FY 2025 Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: N/A</p>	8.925	0.000	0.000
<p>Title: Space Communication Technologies</p> <p>Description: Develop technologies for next-generation space communications terminals and equipment and methods/techniques to enable future space system operational command and control concepts.</p> <p>FY 2024 Plans:</p>	14.468	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F / 2	R-1 Program Element (Number/Name) PE 1206601SF / <i>Space Technology</i>	Project (Number/Name) 628809 / <i>Spacecraft Vehicle Technologies</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
In FY 2024 this thrust is realigned to PE 1206601SF/Space Technology, Project 624846/Spacecraft Payload Technologies, and consolidated under one thrust titled Space Communication/Positioning, Navigation, & Timing Technologies to better align efforts with the USSF SSC PEO's mission areas. FY 2025 Plans: N/A FY 2024 to FY 2025 Increase/Decrease Statement: N/A			
Accomplishments/Planned Programs Subtotals	47.780	26.506	47.970

	FY 2023	FY 2024
Congressional Add: Congressional Add: Program increase - thin-film photovoltaic energy FY 2023 Accomplishments: Conduct Congressionally directed effort.	2.958	-
Congressional Add: Congressional Add: Program increase - hybrid space architecture FY 2023 Accomplishments: Conduct Congressionally directed effort.	4.930	-
Congressional Add: Congressional Add: Program increase - university consortia for space technology FY 2023 Accomplishments: Conduct Congressionally directed effort.	19.721	-
Congressional Add: Congressional Add: Program increase - aerospace films for increased operational range of reconnaissance FY 2023 Accomplishments: Conduct Congressionally directed effort.	5.916	-
Congressional Add: Congressional Add: Program increase - 3D graphene lithium-sulfur batteries FY 2023 Accomplishments: Conduct Congressionally directed effort.	4.930	-
Congressional Add: Congressional Add: Program increase - L-Band active phased array demonstration FY 2023 Accomplishments: Conduct Congressionally directed effort.	2.958	-
Congressional Add: Congressional Add: Program increase - next generation multiband space array antenna FY 2023 Accomplishments: Conduct Congressionally directed effort.	9.860	-
Congressional Add: Congressional Add: Program increase - advanced analog microelectronics FY 2023 Accomplishments: Conduct Congressionally directed effort.	2.958	-
Congressional Add: Congressional Add: Program increase - spectrum superiority lab	4.930	-

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F / 2	R-1 Program Element (Number/Name) PE 1206601SF / <i>Space Technology</i>	Project (Number/Name) 628809 / <i>Spacecraft Vehicle Technologies</i>
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	FY 2023	FY 2024
FY 2023 Accomplishments: Conduct Congressionally directed effort.		
Congressional Add: Congressional Add: Program increase - advanced space power systems	9.269	-
FY 2023 Accomplishments: Conduct Congressionally directed effort.		
Congressional Add: Congressional Add: Program increase - cybersecurity for a hybrid space architecture	14.791	-
FY 2023 Accomplishments: Conduct Congressionally directed effort.		
Congressional Add: Congressional Add: Program increase - flexible solar panels	4.930	-
FY 2023 Accomplishments: Conduct Congressionally directed effort.		
Congressional Add: Congressional Add: Program increase - high efficiency lightweight RF amplifiers for LEO constellation	4.930	-
FY 2023 Accomplishments: Conduct Congressionally directed effort.		
Congressional Add: Congressional Add: Program increase - moving target engagement solutions	5.916	-
FY 2023 Accomplishments: Conduct Congressionally directed effort.		
Congressional Add: Congressional Add: Program increase - operational upper stage augmentation kit	9.860	-
FY 2023 Accomplishments: Conduct Congressionally directed effort.		
Congressional Adds Subtotals	108.857	-

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 1206310SF / <i>Space Science and Technology Research and Development</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	431.411	472.493	425.166	0.000	425.166	477.878	428.174	281.289	428.318	Continuing	Continuing
634869: <i>Space Science and Technology Research and Development</i>	-	431.411	472.493	425.166	0.000	425.166	477.878	428.174	281.289	428.318	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Space Development Agency (SDA) is developing and demonstrating next generation space capabilities for the joint warfighter enabled by proliferation of satellites and a new acquisition model utilizing rapid spiral development. SDA is developing capabilities to address a wide range of Department of Defense (DoD) space needs as stated in the National Defense Strategy and DoD Space Vision, including low-latency tactical communication, beyond line of sight targeting, and advanced missile tracking. Specifically, SDA will demonstrate and field persistent, resilient capabilities needed to be responsive to emerging multi-domain threats against the U.S. national interest. SDA is responsible for the overall programmatic development and execution of a Proliferated Warfighter Space Architecture (PWSA). In coordination with other DoD Space stakeholders, SDA will drive the development of space capabilities to achieve the DoD Space Vision and reduce overlap and inefficiency. SDA will expand the DoD's space warfighting capability and foster growth in the U.S. space industrial base, by developing enhanced government-commercial relationships and international collaborations with key allies and partners.

While SDA is not responsible for building and fielding all capabilities within the PWSA, the Agency is responsible for orchestrating and architecting the PWSA and ensuring capability delivery to the warfighter following a spiral development approach. As part of the PWSA, SDA is building and fielding the Transport Layer, a proliferated constellation of satellites to provide low-latency, beyond line of sight (BLOS), high-volume data transport for the warfighter. This Transport Layer will provide the space-based connectivity backbone for Joint All-Domain Command and Control (JADC2).

The establishment of a proliferated data Transport Layer is essential to developing a new and responsive space architecture. SDA will integrate additional constellations with this Transport Layer to provide multiple warfighting capabilities, such as advanced missile warning, 24/7/365 custody of time critical targets, and alternative position, navigation and timing (APNT) capabilities in navigation warfare (NAVWAR) resilient environments.

This program element funds the research and development activity to deliver capabilities to U.S. joint warfighting forces in two-year tranches, which began in FY 2022, including performing trade studies, technical analyses, or modeling and simulation; identifying and maturing enabling technologies; defining and conducting risk reduction experiments and demonstrations, prototyping hardware or software systems; and exploring novel concepts for future warfighting capabilities.

This program element may include necessary civilian pay expenses and contractor support required to facilitate delivery of the PWSA capability.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 1206310SF / <i>Space Science and Technology Research and Development</i>
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The total cost of the Tranche 1 (T1) Transport Layer Middle Tier of Acquisition effort is \$2,977.300 million, including RDT&E and procurement of prototype units. The T1 Transport Layer RP program is fully funded across the Future Years Defense Program.

The total cost of the Tranche 2 (T1) Transport Layer Middle Tier of Acquisition effort is \$5,250.700 million, including RDT&E and procurement of prototype units. The T2 Transport Layer RP program is fully funded across the Future Years Defense Program.

This program is in Budget Activity 3, Advanced Technology Development because this budget activity includes development of subsystems and components and efforts to integrate subsystems and components into system prototypes for field experiments and/or tests in a simulated environment.

B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	447.472	472.493	489.580	0.000	489.580
Current President's Budget	431.411	472.493	425.166	0.000	425.166
Total Adjustments	-16.061	0.000	-64.414	0.000	-64.414
• 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	-16.061	0.000			
• Other Adjustments	0.000	0.000	-64.414	0.000	-64.414

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 634869: *Space Science and Technology Research and Development*

Congressional Add: *Defense of Low-Earth Orbit Satellites*

Congressional Add: *Defense-in-Depth for Spacecraft Cybersecurity*

Congressional Add Subtotals for Project: 634869

Congressional Add Totals for all Projects

	FY 2023	FY 2024
	7.371	-
	4.817	-
Congressional Add Subtotals for Project: 634869	12.188	-
Congressional Add Totals for all Projects	12.188	-

Change Summary Explanation

The decrease in FY 2023 from the Previous President's Budget to the Current President's Budget is due to reallocations for SBIR/STTR projects.

The decrease from the FY 2024 amount to the FY 2025 amount is due to realignment for higher U.S. Space Force priorities.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 1206310SF / <i>Space Science and Technology Research and Development</i>
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The decrease in FY 2025 from the Previous President's Budget to the Current President's Budget is due to realignment for higher U.S. Space Force priorities.

C. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
<p>Title: Space Development Agency R&E</p> <p>Description: Research and development activities to support development, demonstration, and fielding of a resilient military sensing and data transport capability via a proliferated space architecture in Low Earth Orbit (LEO). The funds support the development of an increasingly broad set of technologies (including alternative navigation solutions, advanced missile tracking, multi-INT fusion algorithms, integrated battle management algorithms, and next generation tactical data links) that are critical to delivering a robust initial warfighting capability in the Proliferated Warfighter Space Architecture (PWSA).</p> <p>FY 2024 Plans:</p> <p>Tranche 0</p> <ul style="list-style-type: none"> - Continue to conduct post-Capstone demonstrations and experimentations with warfighters. - Test and demonstrate more complex on-orbit Tracking data fusion algorithms within the Battle Management Command, Control, and Communications (BMC3) module. - Continue to refine optical inter-satellite communication links from space-to-space, space-to-air, and space-to-ground. - Continue tracking on-orbit operations background data collection and target of opportunity observation. - Continue testing the developed algorithms for integrated BMC3 applications on-orbit. <p>Tranche 1</p> <ul style="list-style-type: none"> - Support risk reduction of Tranche 1 Transport Layer (T1TL) satellites, ground systems and integration. - Conduct interoperability and compatibility testing for key T1TL interfaces including optical communications, space-to-ground radio frequency (RF), Link 16 and Networking and Encryption. - Perform mission engineering support activities including Concept of Operations (CONOPS) and Concept of Employment (CONEMP) development, user segment integration, developmental and operational test planning and characterization and modeling of system performance. - Begin development of user interface Interface Control Documents (ICDs). <p>Tranche 2</p> <ul style="list-style-type: none"> - Continue design of Tranche 2 Transport Layer (T2TL) Alpha system and mission - further proliferation of Link 16 capabilities. - Continue design of T2TL-Beta system and mission - initial global proliferation of tactical satellite communications (TACSATCOM) and Integrated Broadcast Service - Low Earth Orbit (IBS-L) capability. - Begin design of T2TL-Gamma system and mission - further proliferation of advanced capabilities and fire control. - Extend PWSA Ground Segment architecture design to support integration of Tranche 2 system elements and missions. 	419.223	472.493	425.166

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 1206310SF / <i>Space Science and Technology Research and Development</i>
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C. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
<p>Proliferated Warfighter Space Architecture (PWSA) Future Programs (PFP)</p> <ul style="list-style-type: none"> - Construct ground segment network including a Demonstration Operations Center (DOC). - Initiate PFP Ground Segment Integration (PGI) effort to provide a common, enduring ground infrastructure and resources to minimize cost and complexity for PFP space vehicle demonstration and experimentation programs (beginning with FOO Fighter and T2DES). <p>NExT</p> <ul style="list-style-type: none"> - Complete the Critical Design Review for the NExT space systems. - Accept delivery of key long-lead system components in preparation for payload to space vehicle integration. - Implement critical encryption architecture upgrades to support partner payloads operating at multiple classification levels. - Complete system cybersecurity milestones. <p>TxDES</p> <ul style="list-style-type: none"> - Work with DARPA to transfer Blackjack technology into the T1DES program. - Continue design and analysis effort for an additional tactical data link, waveform, and/or alternative position, navigation and timing (APNT) signal planned for demonstration in T2 (i.e., T2 Demonstration and Experimentation System (T2DES)) and proliferation beginning with Proliferated Warfighter Space Architecture (PWSA) Tranche 3 (T3). <p>FY 2025 Plans:</p> <p>Tranche 0</p> <ul style="list-style-type: none"> - Continue to conduct post-Capstone demonstrations and experimentations with warfighters. - Continue tracking on-orbit operations background data collection and target of opportunity observation. - Continue testing the developed algorithms for integrated Battle Management Command, Control and Communications (BMC3) applications on-orbit. <p>Tranche 1</p> <ul style="list-style-type: none"> - Support risk reduction of T1 Transport satellites, ground systems, and integration. - Continue interoperability and compatibility testing for key T1 interfaces including optical communications, space-to-ground RF, Link 16 and Networking and Encryption. - Continue mission engineering support activities including Concept of Operations (CONOPS) and Concept of Employment (CONEMP) development, user segment integration, developmental and operational test planning, and characterization and modeling of system performance. - Continue development of user interface Interface Control Documents (ICDs). 			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 1206310SF / <i>Space Science and Technology Research and Development</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Tranche 2</p> <ul style="list-style-type: none"> - Complete T2TL-Alpha system and mission design. - Complete T2TL-Beta system and mission design. - Complete T2TL-Gamma system and mission design. - Complete PWSA Ground Segment architecture design. <p>Tranche 3</p> <ul style="list-style-type: none"> - Finalize Minimum Viable Capability (MVC) design requirements with warfighting community. - Initiate T3 acquisition and source selection processes leading to space vehicle vendor procurement instruments. <p>PFP</p> <ul style="list-style-type: none"> - Complete facility and network design for the DOC to support demonstrations. - Continue PFP Ground Segment Integration (PGI) effort to provide a common, enduring ground infrastructure and resources to minimize cost and complexity for PFP space vehicle demonstration and experimentation programs (beginning with FOO Fighter and T2DES). <p>NExT</p> <ul style="list-style-type: none"> - Construct NExT ground segment with network interfaces. - Accept delivery of NExT partner payloads for flight integration. - Integrate partner payloads to host NExT space vehicles. - Complete NExT Assembly, Integration, and Test (AI&T) activities, including ground segment verification. - Begin launch of NExT space vehicles. - Assess system cybersecurity. <p>TxDES</p> <ul style="list-style-type: none"> - Complete assembly, integration and test of T1DES space vehicles and finalize demonstration plans. - Finalize development of additional tactical data link, waveform, and/or APNT signal planned for demonstration in T2 (i.e., T2DES) and proliferation beginning with PWSA T3. <p>FY 2024 to FY 2025 Increase/Decrease Statement: The decrease from the FY 2024 amount to the FY 2025 amount is due to realignment for higher U.S. Space Force priorities.</p>			
Accomplishments/Planned Programs Subtotals	419.223	472.493	425.166

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 1206310SF / <i>Space Science and Technology Research and Development</i>
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	FY 2023	FY 2024
Congressional Add: Defense of Low-Earth Orbit Satellites FY 2023 Accomplishments: Applied fast prototyping techniques to develop machine learning algorithms for advanced monitoring capabilities. The development process used data from orbiting satellites and a command and control (C2) center. The proposed system aims to improve the interface between humans and machines to boost situational awareness in space systems. Its primary goal is establishing and sustaining trust between humans and space systems by calibrating their interactions, particularly about essential spacecraft systems, constellations, and C2 operations. Additionally, it will offer rapid machine-based support in formulating tactics, methods, and procedures (TTPs) to restore the integrity of the space system following its degradation and the identification or suspicion of a breach. Performance testing and assessment will be conducted at different stages of the system's development.	7.371	-
Congressional Add: Defense-in-Depth for Spacecraft Cybersecurity FY 2023 Accomplishments: Researched, designed, tested, and deployed cyber defense-in-depth techniques and algorithms for proliferated low earth orbit (LEO) class space vehicles. This lays the foundation for SDA's PWSA architecture against cyber and intrusion exploitation.	4.817	-
Congressional Adds Subtotals	12.188	-

D. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

E. Acquisition Strategy

Partners for these activities include DoD research centers, small businesses, large defense contractors, commercial space providers, Federally Funded Research and Development Centers, University Affiliated Research Centers, Missile Defense Agency (MDA), Space Systems Command (SSC), Space Operations Command (SpOC), Space Training and Readiness Command (STARCOM), and Defense Advanced Research Projects Agency (DARPA). SDA is also a potential transition partner for technology developers seeking to conduct on-orbit experimentation and prototyping.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 1206616SF / <i>Space Advanced Technology Development/Demo</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	157.654	110.033	138.270	0.000	138.270	112.407	115.397	117.008	118.461	Continuing	Continuing
633834: <i>Integrated Space Technology Demonstrations</i>	-	68.556	65.731	95.888	0.000	95.888	70.028	74.376	75.668	76.534	Continuing	Continuing
634868: <i>Maui Space Surveillance System</i>	-	14.759	10.667	20.925	0.000	20.925	20.285	18.329	17.583	17.528	Continuing	Continuing
634922: <i>Space & Missile Rocket Propulsion</i>	-	56.508	22.629	16.456	0.000	16.456	16.971	17.464	18.341	18.869	Continuing	Continuing
63682J: <i>Spacecraft Vehicles</i>	-	17.831	11.006	5.001	0.000	5.001	5.123	5.228	5.416	5.530	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program focuses on four major areas. First, integrated space technology demonstrations, is a series of advanced technology demonstrations designed to address mission needs by applying emerging technologies from the Air Force Research Laboratory, other United States government laboratories, and industry. These areas can include multi-domain technologies such as advanced materials and process in areas such as survivability, readiness, and affordability as well as manufacturing and processes to reduce transition risk, enable cost reduction, improve component and system quality, increase readiness and affordable mission availability, enhance industrial capability, and promote transformation through the industrial base. Second, the program focuses on ground-based optical space situational awareness technology development and demonstration at the Maui Space Surveillance System in Hawaii, as well as the operation and upgrade of the facility. Third, the program develops and demonstrates advanced and innovative low-cost high performance space access and satellite propulsion technologies and components. The last major area, spacecraft vehicles, focuses on developing technologies for next-generation space communications terminals and equipment. Efforts in this program have been coordinated through the Department of Defense Science and Technology Executive Committee process to harmonize efforts and eliminate duplication.

In order to manage, execute, and deliver science and technology capabilities, this program element may include: necessary civilian pay expenses; expenses to support the operation and maintenance of facilities; as well as expenses related to travel, supplies, IT hardware, software and support, administrative contractor services, etc.

The Department of the Air Force technologies in this program are both enabling and enduring as we invest in maturing emerging technologies that address established mission gaps, and transformational technologies that address integrated enterprise capabilities intended to reshape the future force across air, space, and cyber warfighting domains. Development of transformational operational capabilities through advanced technology solutions focuses on five strategic capabilities: Global Persistent Awareness; Resilient Information Sharing; Rapid, Effective Decision-Making; Complexity, Unpredictability, and Mass; and Speed and Reach of Disruption and Lethality.

This program is in Budget Activity 3, Advanced Technology Development because this budget activity includes development of subsystems and components and efforts to integrate subsystems and components into system prototypes for field experiments and/or tests in a simulated environment.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 1206616SF / <i>Space Advanced Technology Development/Demo</i>
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This program is in Budget Activity 3, Advanced Technology Development because this budget activity includes development of subsystems and components and efforts to integrate subsystems and components into system prototypes for field experiments and/or tests in a simulated environment.

B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	167.423	110.033	103.000	0.000	103.000
Current President's Budget	157.654	110.033	138.270	0.000	138.270
Total Adjustments	-9.769	0.000	35.270	0.000	35.270
• 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	-5.522	0.000			
• Other Adjustments	-4.247	0.000	35.270	0.000	35.270

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 633834: *Integrated Space Technology Demonstrations*

Congressional Add: *Congressional Add: Program increase - accelerate cislunar flight experiment*

Congressional Add: *Congressional Add: Program increase - space research hub*

Congressional Add Subtotals for Project: 633834

Project: 634922: *Space & Missile Rocket Propulsion*

Congressional Add: *Congressional Add: Program increase - tridyne multi-mode propulsion*

Congressional Add: *Hall multi-mode propulsion Tech*

Congressional Add: *Additive Mfg of solid rocket propellant*

Congressional Add: *Commercial Space Access Improvements*

Congressional Add: *Congressional Add: Program increase - upper stage engine technology*

Congressional Add Subtotals for Project: 634922

Congressional Add Totals for all Projects

	FY 2023	FY 2024
	19.341	-
	3.868	-
Congressional Add Subtotals for Project: 633834	23.209	-
	2.901	-
	2.901	-
	2.901	-
	4.835	-
	22.629	-
Congressional Add Subtotals for Project: 634922	36.167	-
Congressional Add Totals for all Projects	59.376	-

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force Date: March 2024

Appropriation/Budget Activity
3620F: *Research, Development, Test & Evaluation, Space Force I BA 3: Advanced Technology Development (ATD)*

R-1 Program Element (Number/Name)
PE 1206616SF / *Space Advanced Technology Development/Demo*

Change Summary Explanation

FY 2025 increased compared to FY 2024 by \$28.2M due to the additional funding for continuing the Oracle cislunar flight experiment, Maui base operations support, and USAF to USSF transfers for advanced materials and manufacturing for space applications. This was coupled with a decrease in funding for completion of several W/V Band launch activities and reductions for re-prioritization to meet the nation's future security needs.

The increase in FY2025 from PB 2024 to PB 2025 of \$35.3M reflects additional funding for continuing the Oracle cislunar flight experiment (\$36.0M), Maui base operations support (\$10.0M), USAF to USSF transfers for advanced materials and manufacturing for space applications (\$5.3M) and reductions for re-prioritization to meet the nation's future security needs (\$-16.0M).

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 3					R-1 Program Element (Number/Name) PE 1206616SF / <i>Space Advanced Technology Development/Demo</i>				Project (Number/Name) 633834 / <i>Integrated Space Technology Demonstrations</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
633834: <i>Integrated Space Technology Demonstrations</i>	-	68.556	65.731	95.888	0.000	95.888	70.028	74.376	75.668	76.534	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project is a series of advanced technology demonstrations designed to address mission needs by applying emerging technologies from the Air Force Research Laboratory, other United States government laboratories, and industry. These technologies are integrated into system-level demonstrations that are used to test, evaluate, and validate the technologies in a relevant environment. This project includes the initiation and development of programs addressing Department of the Air Force (DAF) capability gaps and provides technologies for transformational future force capabilities. Transformational efforts will be identified through a competitive process and be responsive to DAF design priorities. Selected efforts will be designated as transformational, indicating enterprise-level priority.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Integrated Satellite Demonstrations	20.410	21.887	18.956
Description: Develop satellite technologies for integrated, robust, and flexible satellite demonstrations building on previous work and leveraging investments by other organizations.			
FY 2024 Plans: Continue development of integrated satellite demonstrations of key space technologies across multi-domain mission areas. Continue design, build, and test of small satellite missions with a focus on capabilities in autonomy, cyber resiliency, and integration of commercial, allied, and government space networks for command and control (C2) of a hybrid space architecture. Continue evolution of the space center of excellence to accelerate transition of space capabilities to the joint warfighter.			
FY 2025 Plans: Continue development of integrated satellite demonstrations of key space technologies across multi-domain mission areas. Complete on orbit demonstration of command and control (C2) networks. Initiate effort to demonstrate traditional large architecture through small satellite employment. Continue design, build, and test of small satellite missions with a focus on capabilities in autonomy, cyber resiliency, and integration of commercial, allied, and government space networks C2 of a hybrid space architecture. Initiate development of space flight experiments focused to increase the resiliency of space missions to emerging threats. Resiliency includes system-level hardening of satellites, rapid manufacturing of payloads, autonomous systems, and hybrid architecture tests that maintain continuity of DOD missions using satellites in various orbits. Using advanced rapid manufacturing methods, individual technologies will be integrated together to experiment with individual satellite resiliency. New technologies include advanced autonomous algorithms to reduce satellite operator burden, novel space cyber flight software (FSW) hardening methods, advanced materials, advanced image processing			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F / 3	R-1 Program Element (Number/Name) PE 1206616SF / <i>Space Advanced Technology Development/Demo</i>	Project (Number/Name) 633834 / <i>Integrated Space Technology Demonstrations</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>techniques and advanced satellite communication technologies to enable hybrid orbit architectures that have minimal impacts to user equipment. Evaluate studies to further development and maturation of space technologies to incorporate into future flight demonstrations.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased compared to FY 2024 by \$2.931M due to finalizing evaluation of prior studies and selecting one new demonstration.</p>				
<p>Title: Transformational Technology Development</p> <p>Description: This funding allocation will initiate new and continue existing transformational technology development. The Department of the Air Force (DAF) needs to provide game-changing leap-ahead capabilities to meet future force designs. This effort identifies transformational science and technology investment opportunities through the WARfighter- TECHNOLOGIST (WARTECH) process. The WARTECH process enables the DAF enterprise to collaboratively translate future force design priorities and requirements into targeted USSF science and technology investments.</p> <p>WARTECH accelerates capability development and responds to emerging technology opportunities by supporting integrated concept exploration. These investments support activities such as mission thread analyses to demonstrate military utility and software and hardware feasibility assessments. Select efforts will evolve into either a Vanguard Pathfinder to allow for further assessment and maturation or be designated a Vanguard Prospect or Vanguard indicating enterprise-level priority.</p> <p>FY 2024 Plans: Continue experiment demonstrating advanced space situational awareness and multi-agent satellite inspection with integration and test of payloads for rendezvous, proximity operations, and docking. Continue development of payloads cislunar space situational awareness experiment. Initiate development of concept flight experiment for multi-domain space operations supporting the joint warfighter base on USSF technology needs.</p> <p>FY 2025 Plans: Complete integrated spacecraft testing, perform launch vehicle integration, launch, and early operations for advanced space domain awareness and multi-agent satellite inspection demonstrating advanced rendezvous, proximity operations, and docking capabilities. Continue development of concept flight experiment for multi-domain space operations supporting the joint warfighter base on USSF technology needs. Initiate efforts to de-risk the maturation of resilient space architectures, components, and systems. Initiate the design and development of space-systems focused modeling and simulation, live virtual constructs, and test and evaluation capabilities. Initiate efforts to increase space-systems autonomy and improve processing and exploitation of space-based data sources.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement:</p>		24.937	26.475	23.001

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F / 3	R-1 Program Element (Number/Name) PE 1206616SF / <i>Space Advanced Technology Development/Demo</i>	Project (Number/Name) 633834 / <i>Integrated Space Technology Demonstrations</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
FY 2025 decreased compared to FY 2024 by \$3.474M due to realized reduction in component cost and to fund higher priority requirements within the DoD.				
<p>Title: Modeling and Simulation Tools for Space Applications</p> <p>Description: Provide modeling, simulation, and analysis for technology evolution in space-based terrestrial surveillance systems, precision navigation and timing, space domain awareness, satellite communications, space environment monitoring, and space control payloads.</p> <p>FY 2024 Plans: Continue mission-level military utility analyses of technology and associated architectures and employment concepts across multi-domain mission areas. Continue refining guidelines and checkpoints for concept maturation evaluations in context of emerging space technologies. Continue to evolve processes for applying model-based systems engineering into technology decision-making and flight experiment design.</p> <p>FY 2025 Plans: Continue mission-level military utility analyses of technology and associated architectures and employment concepts across multidomain mission areas. Continue refining guidelines and checkpoints for concept maturation evaluations in context of emerging space technologies. Continue to evolve processes for applying model-based systems engineering into technology decision making and flight experiment design.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased compared to FY 2024 by \$0.198M due to increased military utility analyses.</p>		0.000	8.852	9.050
<p>Title: Agile Space Operations Technology</p> <p>Description: Develop, provide, and leverage agile software development platforms and pipelines that support pain point identification and rapid software application prototyping, operational evaluation, operator/Guardian effectiveness, and certification in support of USSF operators in collaboration with commercial partners.</p> <p>FY 2024 Plans: Continue to focus on tactical level exploratory development and transition of emerging technologies, refine an environment to perform agile software development and delivery through user focused collaboration and commercial partnerships, and to work with USSF Field Commands and SAF to develop and field a variety of software applications to the USSF Space Delta Units and improve Guardian performance.</p> <p>FY 2025 Plans:</p>		0.000	3.517	3.585

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F / 3	R-1 Program Element (Number/Name) PE 1206616SF / <i>Space Advanced Technology Development/Demo</i>	Project (Number/Name) 633834 / <i>Integrated Space Technology Demonstrations</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>Continue to focus on tactical level exploratory development and transition of emerging technologies to operators, refine an agile software development environment in collaboration with CTIO to perform agile software development and delivery through user focused collaboration and commercial partnerships, and to work with USSF Field Commands and SAF to develop and field a variety of software applications to the USSF Space Delta Units and improve Guardian performance.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased compared to FY 2024 by \$0.068M due to additional software testing.</p>				
<p>Title: Orbital Prime</p> <p>Description: SpaceWERX Orbital Prime will transition agile, affordable, and accelerated space capabilities, reducing risk to the global commons to rapidly field In-space Servicing, Assembly, Manufacturing (ISAM) capabilities.</p> <p>FY 2024 Plans: Pair funding with capabilities being matured through the SpaceWERX Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) pipeline set aside for Orbital Prime, which includes Strategic Funding Increase (STRATFI) matching consideration, and to seed a Prize Challenge such as through the private sector X-Prize program.</p> <p>FY 2025 Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased compared to FY 2024 by \$5.000M due to to completion of the effort.</p>		0.000	5.000	0.000
<p>Title: Cislunar Space Situational Awareness</p> <p>Description: Develop technologies that detect space objects in cislunar space that are challenging to observe using traditional Space Surveillance Network (SSN) assets, and track objects in transit between the Earth/Moon corridor.</p> <p>FY 2025 Plans: Commence assembly integration and testing (AI&T) of the Oracle cislunar spacecraft, delivering increased space situational awareness (SSA) capabilities beyond 10X Geosynchronous Orbit, capable of detecting, tracking and maintaining custody of objects transiting in the Earth-Moon corridor. Continue procurement of remaining payload and spacecraft materials required to complete AI&T. Continue development of cislunar data analysis software and cloud based ground system improving on existing system architectures and leveraging commercial networks for command and control of space vehicle. This was previously funded in the Transformational Technology Development thrust and is not a FY 2025 new start.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement:</p>		-	-	36.000

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F / 3	R-1 Program Element (Number/Name) PE 1206616SF / <i>Space Advanced Technology Development/Demo</i>	Project (Number/Name) 633834 / <i>Integrated Space Technology Demonstrations</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
FY 2025 increased compared to FY 2024 by \$36.000M due to additional funds allocated towards continuing the Oracle Cislunar Flight Experiment. This was previously funded in the Transformational Technology Development thrust as well as with Congressional Adds in FY 2022 and FY 2023 to accelerate cislunar flight. It has been broken out to provide visibility consistent with Congressional interest in cislunar space as articulated in the Department Of Defense Appropriations Bill, 2023.				
<p>Title: Manufacturing for Space Systems</p> <p>Description: Develop and transition technologies to reduce cost and improve acquisition timelines through manufacturing innovations of advanced technologies for Department of the Air Force space and multi-domain applications.</p> <p>FY 2024 Plans: In FY 2024 this work was accomplished in 3600: Research, Development, Test & Evaluation, USAF; Program 0603680F/ Manufacturing Technology Program, Project 635280/Manufacturing Technology; Effort: Affordable Mission Availability.</p> <p>FY 2025 Plans: Develop technologies to improve efficiency gains to radiation shielding and thermal control through adapting manufacturing processes for new materials technology. Investigate yield improvements and cost reduction on space-based sensors. Improve yield and cost reduction on efforts for in-space maneuverability. Initiate identification of Department of the Air Force needs for in-space assembly and manufacturing.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased compared to FY 2024 by \$2.194M due to funds transferred from the USAF program as shown in the FY 2024 plans.</p>		-	0.000	2.194
<p>Title: Advanced Materials for Spacecraft Resilience</p> <p>Description: Develop advanced materials and technologies for spacecraft structures, mission-systems, and payloads to ensure survivability and mission effectiveness from electro-magnetic spectrum threats and hazards. These technologies are applicable to spacecraft at all orbital regimes and supports numerous programs of record (PoRs) spanning multiple government agencies. They are synchronized with related air-domain efforts executed in 3600: Research, Development, Test & Evaluation, Air Force; Program 0603112F/Advanced Materials for Weapon Systems, Project 632100/Laser Hardened Materials.</p> <p>FY 2024 Plans: In FY 2024 this work was accomplished in 3600: Research, Development, Test & Evaluation, USAF; Program 0603112F / Advanced Materials for Weapon Systems; Project 632100, Laser Hardened Materials; Effort: Aerospace Systems Protection.</p> <p>FY 2025 Plans:</p>		-	0.000	3.102

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 3	R-1 Program Element (Number/Name) PE 1206616SF / <i>Space Advanced Technology Development/Demo</i>	Project (Number/Name) 633834 / <i>Integrated Space Technology Demonstrations</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
Continue development of resilient materials for spacecraft structures. Investigate environmental compatibility of materials at low earth orbit and other orbital regimes. FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased compared to FY 2024 by \$3.102M due to funds transferred from the USAF program as shown in the FY 2024 plans.			
Accomplishments/Planned Programs Subtotals	45.347	65.731	95.888

	FY 2023	FY 2024
Congressional Add: Congressional Add: Program increase - accelerate cislunar flight experiment FY 2023 Accomplishments: Conduct Congressionally directed effort.	19.341	-
Congressional Add: Congressional Add: Program increase - space research hub FY 2023 Accomplishments: Conduct Congressionally directed effort.	3.868	-
Congressional Adds Subtotals	23.209	-

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 3					R-1 Program Element (Number/Name) PE 1206616SF / <i>Space Advanced Technology Development/Demo</i>				Project (Number/Name) 634868 / <i>Maui Space Surveillance System</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
634868: <i>Maui Space Surveillance System</i>	-	14.759	10.667	20.925	0.000	20.925	20.285	18.329	17.583	17.528	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program funds ground-based optical space situational awareness technology development and demonstration at the Maui Space Surveillance System (MSSS) in Hawaii, as well as the operation and upgrade of the experimental equipment and required facilities. Efforts in this program have been coordinated through the Department of Defense Science and Technology Executive Committee process to harmonize efforts and eliminate duplication.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Operate and Upgrade Maui Space Surveillance System	14.759	10.667	20.925
Description: Operate, sustain, and upgrade the Maui Space Surveillance System (MSSS) to support development, demonstration, and integration of ground-based optical space domain awareness technologies for use in R&D, as well as for missions conducted by the Space Operations Command DELTA 2/15 Space Surveillance Squadron (SPoC/DEL2/15SPSS).			
FY 2024 Plans: Continue to maintain the Maui Space Surveillance System (MSSS) research and development (R&D) facilities and experimental equipment in a mission-ready state including needed upgrades and modernization to keep the R&D facilities and equipment in good working order to perform efficiently and reliably. Continue to operate MSSS R&D facilities for development and demonstration of ground-based space domain awareness capabilities in conjunction with customer programs and to contribute to the Space Operations Command (SPoC)/DEL2/15SPSS's operational Space Domain Awareness (SDA) mission as needed. Continue to collect observations of satellites as requested by mission partners. Continue to operate the prototype regional wide-area-search of the geosynchronous belt in the Pacific Area of Responsibility (AOR) until the Ground-Based Electro-Optical Deep Space Surveillance (GEODSS)-Maui installation reaches initial operating capability (IOC) for its search-based surveillance capability. Initiate expert assistance to 15 SPSS in R&D design requirements during the construction of the new Air Force Maui Optical and Supercomputing (AMOS) facility funded under military construction (MILCON) authority. Initiate expert assistance to 15 SPSS in R&D design requirements and environmental assessment as a lead up to reconstruction of the Small Telescope Advanced Research site. Continue to host missions in the Pacific AOR for Department of Defense (DoD) components and other government agencies.			
FY 2025 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F / 3	R-1 Program Element (Number/Name) PE 1206616SF / <i>Space Advanced Technology Development/Demo</i>	Project (Number/Name) 634868 / <i>Maui Space Surveillance System</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Continue to maintain the Maui Space Surveillance System (MSSS) research and development (R&D) facilities and experimental equipment in a mission-ready state, including needed upgrades and modernization to keep the R&D facilities and equipment in good working order to perform efficiently and reliably.</p> <p>MSSS R&D facilities for development and demonstration of ground-based space domain awareness capabilities in conjunction with customer programs and to contribute to the Space Operations Command (SPoC)/DEL2/15SPSS's operational Space Domain Awareness mission as needed.</p> <p>Continue to collect observations of satellites as requested by mission partners.</p> <p>Continue to operate the prototype regional wide-area-search of the geosynchronous belt in the Pacific Area of Responsibility (AOR) until the (Ground-Based Electro-Optical Deep Space Surveillance) GEODSS-Maui installation reaches initial operating capability (IOC) for its search-based surveillance capability.</p> <p>Continue expert assistance to 15 SPSS in R&D design requirements during the construction of the new Air Force Maui Optical and Supercomputing (AMOS) facility funded under military communication (MILCON) authority.</p> <p>Complete expert assistance to 15 SPSS in R&D design requirements and environmental assessment as a lead up to re-construction of the Small Telescope Advanced Research site.</p> <p>Continue to host missions in the Pacific AOR for DoD components and other government agencies.</p> <p><i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> Increase from FY 2024 to FY 2025 of \$10.258M to fund necessary base operations support.</p>			
Accomplishments/Planned Programs Subtotals	14.759	10.667	20.925

C. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

D. Acquisition Strategy
N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 3					R-1 Program Element (Number/Name) PE 1206616SF / <i>Space Advanced Technology Development/Demo</i>				Project (Number/Name) 634922 / <i>Space & Missile Rocket Propulsion</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
634922: <i>Space & Missile Rocket Propulsion</i>	-	56.508	22.629	16.456	0.000	16.456	16.971	17.464	18.341	18.869	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops and demonstrates advanced liquid rocket engine technologies, components, engines, and integrated systems for launch vehicles. Characteristics such as environmental acceptability, affordability, reliability, responsiveness, reduced weight, and reduced operation and launch costs are emphasized. The objective is to reduce costs, simplify manufacturability, increase performance and life/reusability as well as payload lift capability. Additionally, this project investigates and demonstrates technologies that will improve responsiveness and resiliency of space access systems and launch infrastructure. This project also develops and demonstrates solar electric, electric, chemical, and advanced propulsion technologies, for station-keeping, repositioning, and orbit transfer for satellites and satellite constellations. This effort develops technologies for flexible, responsive in-space maneuver in all orbit regimes. These technologies are critical to expanding Space Force's capability to deliver capabilities resiliently and responsively in, to, and through space. This project further develops and demonstrates the next generation of physics-based modeling, simulation, and analysis (MS&A) tools for rapid and agile space access and in-space propulsion design, analysis, and production, as well as the digital engineering concepts to manage the entire process of design, test, and validation of space access and in-space systems. All efforts in this project contribute to the sustainment and growth of the space and rocket propulsion industry, providing space access and in-space propulsion technology for the entire Department of Defense (DoD). Technologies under this project enable capabilities of interest to DoD, National Aeronautics and Space Administration (NASA), and growing Space community. The efforts in this project are reviewed by a DoD level steering committee annually for relevance to DoD missions, and the associated support costs.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Space Access Propulsion Technologies	8.835	9.828	2.703
Description: Develop and demonstrate liquid rocket propulsion technology for current and future space launch vehicles. Demonstrate technologies and concepts of operation supporting rapid launch capability.			
FY 2024 Plans: Continue modular engine feasibility to address scalability, applicability, testability, and life cycle cost for National Security Space applications. Continue development of disruptive engine concepts/cycles for liquid propellant engines, engine system components, and control for space launch system. Continue evaluation of austere location launch capability with commercial partners and demonstration opportunities, driving towards a sustainable rapid launch capability. Continue coordination of technology transition opportunities for space access to manage technology insertion and evaluate capabilities for rocket engine hardware and related systems. Initiate a digital framework for space access planning, integration, modeling and logistical areas to facilitate rapid launch capabilities.			
FY 2025 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 3	R-1 Program Element (Number/Name) PE 1206616SF / <i>Space Advanced Technology Development/Demo</i>	Project (Number/Name) 634922 / <i>Space & Missile Rocket Propulsion</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Continue evaluation of launch capability with commercial partners and demonstration opportunities. Continue coordination of technology transition opportunities for space access to manage technology insertion and evaluate capabilities for rocket engine hardware and related systems. Reduce efforts for digital framework development for space access planning, integration, and modeling; modular engine feasibility evaluation for National Security Space applications; and development of disruptive engine concepts, engine components, and control for space launch system.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY2025 decrease compared to FY2024 by \$7.125M due to re-prioritization to meet the nation's future security needs.</p>			
<p>Title: Advanced On-Orbit Propulsion Technologies</p> <p>Description: Develop and demonstrate solar electric, electric, and monopropellant propulsion technologies for existing and future satellites, upper stages, orbit transfer vehicles, and satellite maneuvering.</p> <p>FY 2024 Plans: Continue to develop and transition experimental, modeling and simulation, and theoretical efforts geared towards advanced thruster development with emphasis on understanding thrust scale-up. Continue analysis and development of multi-mode propulsion opportunities to combine high efficiency and high thrust capabilities on a common propellant. Continue thrust scale-up effort for advanced non-toxic propellant for use in monopropellant thrusters and electric propulsion thrusters for a multi-mode propulsion capability. Continue flight-weight design and development of multimode propulsion flight system combining capabilities of chemical thrusters and electric propulsion thrusters and utilizing a single common propellant for greater operational potentiality. Initiate design and development of high power electric propulsion thrusters for enhanced maneuver capability.</p> <p>FY 2025 Plans: Continue to develop, demonstrate and transition experimental, modeling and simulation, and theoretical efforts geared towards advanced thruster development with emphasis on understanding thrust scale-up. Continue analysis and development of multi-mode propulsion opportunities to combine high efficiency and high thrust capabilities on a common propellant. Continue thrust scale-up effort for advanced non-toxic propellant for use in monopropellant thrusters and electric propulsion thrusters for a multi-mode propulsion capability. Continue flight-weight design and development of multimode propulsion flight system combining capabilities of chemical thrusters and electric propulsion thrusters and utilizing a single common propellant for greater operational capability. Continue design and development of high power electric propulsion thrusters for enhanced maneuver capability. Initiate development of modular propulsion architectures that allow for rapid integration & transition of new propulsion technology.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement:</p>	11.506	12.801	12.547

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 3	R-1 Program Element (Number/Name) PE 1206616SF / <i>Space Advanced Technology Development/Demo</i>	Project (Number/Name) 634922 / <i>Space & Missile Rocket Propulsion</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
FY2025 decreased compared to FY2024 by \$0.254M. Funding decreased due to consolidation of testing activities driven by budget limitation.			
<p>Title: Space Warfighter Technologist Capabilities</p> <p>Description: This funding allocation will initiate new transformational technology development. The Department of the Air Force (DAF) needs to provide game-changing leap-ahead capabilities to meet future force designs. This effort identifies transformational science and technology investment opportunities through the WARfighter- TECHnologist (WARTECH) process. The WARTECH process enables the DAF enterprise to collaboratively translate future force design priorities and requirements into targeted USSF science and technology investments.</p> <p>WARTECH accelerates capability development and responds to emerging technology opportunities by supporting integrated concept exploration. These investments support activities such as mission thread analyses to demonstrate military utility and software and hardware feasibility assessments. Select efforts will evolve into either a Vanguard Pathfinder to allow for further assessment and maturation or be designated a Vanguard Prospect or Vanguard indicating enterprise-level priority.</p> <p>FY 2024 Plans: N/A</p> <p>FY 2025 Plans: In FY25 the efforts to de-risk the maturation of resilient space architectures, components and systems are not new starts. Funds will be realigned to PE 1206616SF/Space Advanced Technology Development/Demo, Project 633834/Integrated Space Technology Demonstrations. A correction is going to be requested during year of execution to properly align funding.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 funding increased compared to FY 2024 by 1.206M to fund efforts for risk reduction of space architectures, components, and systems.</p>	0.000	0.000	1.206
Accomplishments/Planned Programs Subtotals	20.341	22.629	16.456

	FY 2023	FY 2024
Congressional Add: Congressional Add: Program increase - tridyne multi-mode propulsion	2.901	-
FY 2023 Accomplishments: Conduct Congressionally directed effort.		
Congressional Add: Hall multi-mode propulsion Tech	2.901	-

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 3	R-1 Program Element (Number/Name) PE 1206616SF / <i>Space Advanced Technology Development/Demo</i>	Project (Number/Name) 634922 / <i>Space & Missile Rocket Propulsion</i>

	FY 2023	FY 2024
FY 2023 Accomplishments: Conduct Congressionally directed effort.		
Congressional Add: Additive Mfg of solid rocket propellant	2.901	-
FY 2023 Accomplishments: Conduct Congressionally directed effort.		
Congressional Add: Commercial Space Access Improvements	4.835	-
FY 2023 Accomplishments: Commercial Space Access Improvements		
Congressional Add: Congressional Add: Program increase - upper stage engine technology	22.629	-
FY 2023 Accomplishments: Conduct Congressionally directed effort.		
Congressional Adds Subtotals	36.167	-

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 3	R-1 Program Element (Number/Name) PE 1206616SF / <i>Space Advanced Technology Development/Demo</i>	Project (Number/Name) 63682J / <i>Spacecraft Vehicles</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
63682J: <i>Spacecraft Vehicles</i>	-	17.831	11.006	5.001	0.000	5.001	5.123	5.228	5.416	5.530	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops and demonstrates technologies critical to addressing documented military satellite communications capability gaps and top-ranked United States Space Force (USSF) and/or Space Systems Command (SSC) technology needs.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Space Communication Technologies	17.831	11.006	5.001
Description: Develop technologies for next-generation space communications terminals and equipment, along with methods/techniques to enable future space system operational command and control concepts.			
FY 2024 Plans: Initiate W/V-band transponder integration and testing activities. Prepare integrated payload for launch. Finish development of ground terminal capabilities to support transponder testing and experimentation. Continue on-orbit beacon experiment, including mission support, transmission of test signals, operation of ground receiver terminals, collection and archiving of data, monitoring of environmental conditions, and analysis of environmental impacts on W/V propagation.			
FY 2025 Plans: Continue on-orbit W/V-band beacon experiment, including mission support, transmission of test signals, operation of ground receiver terminals, collection and archiving of data, monitoring of environmental conditions, and analysis of environmental impacts on W/V propagation. Complete W/V-band transponder launch and early on-orbit operations. Initiate transponder experiments and technology demonstrations. Operate and maintain ground transceiver. Collect, analyze, and archive data.			
FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased compared to FY 2024 by \$6.005M due to W/V-band transponder launch and early on-orbit operations.			
Accomplishments/Planned Programs Subtotals	17.831	11.006	5.001

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 3	R-1 Program Element (Number/Name) PE 1206616SF / <i>Space Advanced Technology Development/Demo</i>	Project (Number/Name) 63682J / <i>Spacecraft Vehicles</i>

D. Acquisition Strategy
N/A

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604002SF / <i>Space Force Weather Services Research</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	0.816	0.849	0.867	0.000	0.867	0.888	0.906	0.938	0.957	Continuing	Continuing
645353: <i>SF Weather Services Research</i>	-	0.816	0.849	0.867	0.000	0.867	0.888	0.906	0.938	0.957	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This budget activity funds the development necessary to evaluate integrated technologies and models for future operationalization into segments of the Space Force Weather Services (SFWS) in support of the 2022 National Defense Strategy's (NDS) three lines of effort. To improve readiness for a more lethal force, SFWS provides timely, accurate, resilient and relevant environmental information, to include space and terrestrial weather, for global battlespace situational awareness for Air Force (AF), Army, Special Operations Forces (SOF), Space Force (USSF), combatant commands, the Intelligence Community (IC), and other government agencies. SFWS capabilities at home station and deployed provide critical environmental information in support of decision makers to gain the asymmetric advantage during the full spectrum of air and space combat operations. SFWS development enhances the lethality, effectiveness, and survivability of AF & SF weapon systems and precision munitions by modernizing capability and seeking the military advantage to accurately predict friendly and foe environmental impacts to optimize mission execution and planning, targeting, weaponing, battle damage assessment, and space systems operations. To strengthen alliances and partnerships, SFWS development efforts integrate Department of Defense (DoD), government agency, commercial, and international partner environmental data with SFWS information system equipment for processing, storing, exploiting, and disseminating all-domain weather information for analysis, forecasting, mission integration, and greater interoperability. To ensure greater performance and affordability for the AF and SF, SFWS systems are being modernized through improvements to architecture and system efficiency, cybersecurity, joint all-domain command and control (JADC2) and sensing grid integration, migration to cloud computing, and expanding agile software development practices.

SFWS aligns activities under four capability areas: Weather Data Collection, Weather Data Analysis and Dissemination, Weather Forecasting, and Product Tailoring/Warfighter Applications (PTWA). This alignment ensures an integrated and systems-oriented approach to program management decisions. A portion of the Weather Forecasting capability is addressed by RDT&E, BA 04, PE 0604002S, Project 645353 - Space Force Weather Services Research.

Weather Forecasting provides global and regional advanced scientific numerical weather prediction capabilities for automated, high-resolution forecast products for mission planning and execution. Space weather modeling assists in characterizing and forecasting the near-earth environment to the sun and enables space weather anomaly and space weather impact assessments. Weather Forecasting includes activities for Numerical Weather Modeling (NWM) and Space Weather Analysis and Forecast System (SWAFS). SWAFS is a software suite of 47 models and applications to ingest, process, and store space environmental data, run space environmental models to specify and forecast the near-earth environment, and run space effects characterization applications.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604002SF / <i>Space Force Weather Services Research</i>
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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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	0.816	0.849	0.865	0.000	0.865
Current President's Budget	0.816	0.849	0.867	0.000	0.867
Total Adjustments	0.000	0.000	0.002	0.000	0.002
• 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	0.002	0.000	0.002

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Title: Space Weather Analysis and Forecast System (SWAFS) Radio Frequency Ionospheric Scintillation Application (RISA version 2) software upgrade</p> <p>Description: SWAFS RISA is an Air Force Research Laboratory (AFRL) Analysis of Alternatives (AoA) to upgrade software allowing use of model algorithms that utilize sensor packages on the Constellation Observing System to monitor Meteorology, Ionosphere, and Climate (COSMIC II) to understand space environment conditions affecting satellites and communications. Johns Hopkins University/Applied Physics Lab (JHU/APL) will perform model upgrades to Ionospheric Data Assimilation - Four Dimensional (IDA4D) to ensure compatibility with a Gov Cloud environment within the SWAFS Space Domain Awareness Environmental Toolkit - for Defense (SET4D) baseline.</p> <p>FY 2024 Plans: AFRL continues development of Radio frequency Ionospheric Scintillation Application v2.0, Solar Forecasting System (SFS), and Ultra High Frequency (UHF) communication prototype AoAs. JHU/APL develops observation support from Super-Darn ground system and Space-Based JHU/APL prototypes to begin initial evaluation of National Defense Authorization Act 2021 Arctic strategy.</p> <p>FY 2025 Plans:</p>	0.816	0.849	0.867

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604002SF / <i>Space Force Weather Services Research</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
Continue development of upgrade to the Space Weather High Frequency Model, in conjunction with the AFRL development of the Scintillation Nowcast Forecast Model Update, that identifies space environment impacts to DoD and Intelligence Community communications to and through space.			
Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain, leveraging commercial and international opportunities, if appropriate. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc.			
<i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> FY 2025 increased due to increased effort for high frequency model upgrade development.			
Accomplishments/Planned Programs Subtotals	0.816	0.849	0.867

D. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
• RDTE 07 1203940S: <i>Space Situation Awareness Operations</i>	3.144	3.931	3.121	-	3.121	3.222	3.288	3.407	3.474	Continuing	Continuing

Remarks

E. Acquisition Strategy
SWAFS will use individual Federal Acquisition Regulation (FAR) based and rapid acquisition contracting methods, as well as AFRL for development works (Technology Readiness Level (TRL) 6 and below) to develop AoA, design solutions, and prototype code.

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 0604002SF / <i>Space Force Weather Services Research</i>	Project (Number/Name) 645353 / <i>SF Weather Services Research</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Scintillation Nowcast Forecast Model Update AoA</i>				
JHU/Ovation prime and IDA4D Modernization	2	2023	4	2024
<i>Space Weather Model Upgrade Development</i>				
Develop RISA v2.0	1	2023	4	2025
High Frequency Communication Tool	1	2025	4	2026
Hi-Latitude communications specifications and forecasts	1	2027	4	2029
Improved solar wind forecasting for satellite health and drag specifications	1	2027	4	2029

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 1203010SF I Space Force IT, Data Analytics, Digital Solutions
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	0.000	61.723	88.610	0.000	88.610	108.027	116.921	123.882	131.038	Continuing	Continuing
645620: <i>Digital Engineering</i>	-	0.000	40.815	42.242	0.000	42.242	36.605	36.675	37.563	38.284	Continuing	Continuing
646017: <i>SSC Developmental IT Infrastructure</i>	-	0.000	20.908	46.368	0.000	46.368	71.422	80.246	86.319	92.754	Continuing	Continuing

Note

This program, BA 4, PE 1203010SF, project , USSF Integrated Operations Network (ION), is a new start.

In FY 2025, Project 645620 will begin to merge, integrate and consolidate Digital Engineering investments with the goal of providing an initial Digital Engineering Ecosystem capability for the United States Space Force (USSF). In particular prototypes and lessons learned from Space Digital Ecosystem and Integration (SpaceDEN), and Digital Engineering Interconnected Cloud-based Ecosystem (DEICE) and other USSF digital ecosystem investments will merge into one USSF Digital Engineering Ecosystem effort in FY 2025

A. Mission Description and Budget Item Justification

Digital Engineering (DE) is one of four USSF Focus areas in the Service's digital transformation, and is a key enabler. The Space Force was born as a digitally-driven organization to meet the need to respond faster to global threats and to act as a force multiplier for the lean Service. The "USSF Vision for a Digital Service," May 2021, signed by the Chief of Space Operations, states that "A key aim of [Digital Engineering] is to manage the complexity of contemporary weapon system acquisition as well as accelerate and modernize the entire capability development lifecycle—from conception to deployment to operations and sustainment." The USSF Digital Engineering Ecosystem stakeholders are from across the capability development lifecycle. Users include engineers, program managers, force designers, requirements professionals, finance professionals, contracting professionals, logisticians, acquisition leaders and decision makers, mission partners, industry connections, and all other participants in the Capability Development Lifecycle. The Department of Defense's (DoD) Defense Acquisition University definition of Digital Engineering Ecosystem is, "The interconnected infrastructure, environment, and methodology (process, methods, and tools) used to store, access, analyze, and visualize data and models to address the needs of stakeholders." The current funding profile will demonstrate a robust capability for approximately 2000 users with the goal to scale up to accommodate users across the USSF. This includes cloud-hosted and on-premises virtual machines with integrated applications tailored to users for access on users' desks through the web as well as demonstration of secure thin client and other user devices for user access. The modernized capability buildout is for all security classification domains from Controlled Unclassified Information (CUI) to Secret, Top Secret (TS), Sensitive Compartmented Information (SCI) and Special Access Program (SAP). For the SAP deployment, the program also provides initial capability for necessary secure lab space to conduct capability development using the toolsets.

This program supports the Secretary of the Air Force (SecAF) Operational Imperative (OI) #1, "Space Order of Battle" and OI #2, "Optimized Advanced Battle Management System" (ABMS). OI #1 requires the USSF to field space-based services that are resilient to attack. The Digital Engineering Ecosystem (DEE) provides the modernized capability development toolsets to accomplish design, development, sustainment and retirement decisions in support of that goal across the entire United States (US) military space portfolio. The DEE is essential for managing the complexity of the system-of-systems design and development orchestration necessary to build out a resilient architecture for space-based operational support systems. Additionally, the DEE improves the agility of the USSF acquisition workforce,

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1203010SF / <i>Space Force IT, Data Analytics, Digital Solutions</i>
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enabling quicker and more informed decision making and faster delivery of capabilities to warfighters. In support of OI #2, the DEE also projects to demonstrate digital engineering toolsets for the design of the USSF led portion of ABMS with the potential to scale. In addition, the program demonstrates digital transformation for use by all Space Systems Command (SSC) program offices.

Project 645620, Digital Engineering, demonstrates and builds a scalable initial increment of the DEE and demonstrates a Digital Services Ecosystem (DSE) for Space Force Capability Development. Strategic Analysis Tools will continue development of USSF Space Enterprise Architecture Modeling. The Science, Technology, and Research Studies effort focuses on an Artificial Intelligence Accelerator with the Massachusetts Institute of Technology.

Project 646017, SSC Developmental IT Infrastructure, in FY 2025 supports the SSC Chief Information Office by implementing cybersecurity integration, a Cybersecurity Operations Center, Authorizing Official and Risk Management Framework cyber assessment team, Zero Trust, and supply chain risk management capabilities. This project also includes USSF's Integrated Operations Network (ION) effort. ION will provide a secure, reliable, multi-classification data transport high speed backbone across kill webs.

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

This program element may include necessary support required to ensure a cyber-secure and resilient IT infrastructure.

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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	0.000	61.723	62.312	0.000	62.312
Current President's Budget	0.000	61.723	88.610	0.000	88.610
Total Adjustments	0.000	0.000	26.298	0.000	26.298
• 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	26.298	0.000	26.298

Change Summary Explanation

FY 2025: +24.985M for Integrated Operations Network; + 1.150M for advanced space capability modeling; and other minor adjustments.

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 4					R-1 Program Element (Number/Name) PE 1203010SF / <i>Space Force IT, Data Analytics, Digital Solutions</i>				Project (Number/Name) 645620 / <i>Digital Engineering</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
645620: <i>Digital Engineering</i>	-	0.000	40.815	42.242	0.000	42.242	36.605	36.675	37.563	38.284	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 645620 consolidates investments in resilient information technology infrastructure and platforms, data solutions, software toolsets across all classification levels for Digital Engineering use cases across the entire USSF into a USSF Digital Engineering Ecosystem program. Prior year's work on Space Digital Ecosystem and Integration (SpaceDEN), and Digital Engineering Interconnected Cloud-based Ecosystem (DEICE), SSC Developmental IT Infrastructure and other USSF digital ecosystem investments will merge into one IT Infrastructure and USSF Digital Engineering Ecosystem effort in FY 2025.

The Space Digital Ecosystem & Integration (SpaceDEN) program develops capabilities that support SSC's Protect and Defend assets in an increasingly contested space environment. The digital infrastructure is vital in connecting capabilities from sensor-to-shooter to close multifaceted kill chains across all warfighting domains. SpaceDEN digitizes Space Domain Awareness and Combat Power (SDACP) and Protect and Defend portfolios, enabling acquisition decisions at the speed of relevance, synergizing partnerships with industry, and closing capability gaps across both portfolios. This program will develop a Multi-Level Security Architecture utilizing a hybrid cloud by incorporating data integration across Authoritative Sources of Truth (ASOT) and Single Sources of Truth (SSOT). Building unclassified to classified network systems, digital engineering environment (DEE), and IT equipment within a physical facility, it will provide employees a place to work SAP activities and support Multi-level Security (MLS) labs. These activities include: system and data engineering, data science, prototype mock-ups, demonstrations and testing, and modeling simulations and analysis through highly complex Space Command and Control (C2) systems. The SpaceDEN efforts will be merged and harmonized to support the buildout of the SAP portion of the USSF Digital Engineering Ecosystem.

DEICE Tech Stack prototypes and develops the Digital Services Ecosystem (DSE) for Space Force Capability Development as a cloud-based, remotely accessible, multilevel security, interconnected infrastructure, providing the technical methodology used to store, access, analyze, and visualize evolving systems' data and models throughout systems' acquisition lifecycles. Digital Engineering (DE) includes the development and prototyping of critical technology and helps create models to represent all aspects of the system. DE supports all activities for the design, development, manufacture, and operation of the system throughout its lifecycle resulting in reduced sustainment costs. The data transport and cross domain layers will expand further, resulting in greater capability for synchronous C2. DEICE prototype lessons learned will be incorporated to build out the USSF Digital Engineering Ecosystem.

The USSF Digital Engineering Ecosystem includes information technology (IT), system security engineering, software, data and network modernization. The IT efforts will demonstrate IT capabilities for use in accelerating and modernizing the USSF capability development lifecycle in support of the Space Force USSF Digital Services Ecosystem. Information Technology provides customers proper tools needed to accomplish their mission. These tools enhance customer collaboration, end-user experience, exploration and integration amongst our mission partners and industry. Digital Engineering Ecosystem IT Infrastructure helps assess technical risks associated with use, by understanding the System and Enterprise-level risks posed by threats based on deployment and gathered intelligence. The software sector aims to bring Software Agile best practices as mainstream into acquisition; it also enables Platform and Infrastructure at scale based on mission thread needs. The Digital

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1203010SF / <i>Space Force IT, Data Analytics, Digital Solutions</i>	Project (Number/Name) 645620 / <i>Digital Engineering</i>
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Engineering Ecosystem IT infrastructure provides deliberate data exposure and "normalizes" the data to make it meaningful and useful for any business or mission use case that desires to exploit it. The network modernization improves and optimizes administrative/mission networks and end-user experiences across several enclaves.

Funding will investigate, develop, and analyze USSF-unique research via studies/grants/partnerships to promote efficiency and speed leveraging industry, academia, international and other government agencies. The effort specifically focuses on taking advantage of commercial technologies available in industry for digital transformation. This funding is required to serve Chief of Space Operations priority efforts to innovate and experiment and to build an agile force that better ensures our long-term competitive advantage in space. These efforts promote competition between various research organizations (e.g., laboratories, FFRDCs, etc.) to advance critical research for contested space operations. Funding will also advance space capability modeling to support wargaming and analysis and continue development of the USSF Space Enterprise Architecture Modeling.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
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Title: Digital Engineering Integration	0.000	35.993	36.204
<p>Description: USSF Digital Engineering Ecosystem (USSF DEE) is the aggregation of multiple Environments, ASOTs, SSOTs driving toward improved data layers throughout the USSF. This integration effort enables capability development to support creation of computer readable models to represent all aspects of the system, design activities, development, manufacture, and operation of the system throughout its lifecycle. USSF DEE will lead to greater efficiency and improved quality of all the acquisition activities. USSF DEE will incorporate components of and lessons learned from prior Digital Engineering prototyping efforts SpaceDEN and DEICE and several other Digital Engineering investments across the USSF.</p> <p>FY 2024 Plans: Leverage existing contract vehicles for awarding Other Transaction Authority (OTA) and select Small Business Innovation Research (SBIR) Phase III contracts enabling digital Engineering and Integration Test Infrastructure that allow for DEE assessments. Prototype, develop, test and establish the Space Force Digital Engineering as a Service (DEaas) Environments hosted on Hybrid cloud platform for cloud-computing and database storage (compute & store) via SpaceDEN.</p> <p>Develop and test the minimum viable product (MVP) for DEaaS by providing prototypes/demos using digital engineering tools and collaboration work spaces for the architects and systems engineers of the initial programs enabling Space System Integration activities and synergies with existing and evolving space force programs.</p> <p>Continue development, integration and testing of DEaaS with Integration Execution activities and MLS tests. These tests will update the Government Reference Architecture (GRA) for SpaceDEN Environments with acquisition and operational databases and add additional programs into the DEaaS Environment from across SSC.</p> <p>Implement Integration and Operational practices for system monitoring and security procedures. Ensure Security accreditation for MLS infrastructure.</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1203010SF / <i>Space Force IT, Data Analytics, Digital Solutions</i>	Project (Number/Name) 645620 / <i>Digital Engineering</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Additionally, FY 2024 funding will allow the program to continue to implementing DE resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to: studies, technical analysis, risk reduction experiments and prototyping, integration and test of C2, resiliency measures and mission partner interfaces, space test/ combat range events, and office support etc.</p> <p>FY 2025 Plans: Leverage existing contract vehicles for awarding Other Transaction Authority (OTA) and select Small Business Innovation Research (SBIR) Phase III contracts and IT integration service contracts enabling Digital Engineering and Integration prototype infrastructure that allow for assessments and capability solutions. Continue to prototype, develop, test and establish the a USSF Digital Engineering Ecosystem hosted on Hybrid cloud platform for cloud-computing and database storage (compute & store) as well as networking required.</p> <p>Develop and test the minimum viable product (MVP)/program increments by providing prototypes/demos using digital engineering tools and collaboration workspaces for the architects and systems engineers from initial programs to program of record enabling Space System Integration activities and synergies with existing and evolving Space Force programs.</p> <p>Fund and establish new networks, accreditation, digital tools, Model Based System Engineering, model and analysis, Special Access Program Platform-as-a-Service (PaaS) in support of Cyber operations, POM support planning, Kill Chain analysis, digital source selection, enterprise integration, intelligence, and penetration testing.</p> <p>Continue development, integration and testing of the USSF Digital Engineering Ecosystem with Integration Execution activities and MLS/cross-domain solution (CDS) prototypes. These prototypes will update the Government Reference Architecture (GRA) for USSF DEE to begin integration between acquisition and operational databases, and add additional programs into USSF DEE from across SSC.</p> <p>Implement Integration and Operational practices for system monitoring and security procedures. Ensure Continuous Authority to Operate (ATO) Security accreditation for MLS infrastructure.</p> <p>Begin to scale USSF Digital Engineering Ecosystem minimum viable product (MVP) access for a subset of 3000 users across the Space Force. This includes increasing the capacity of user access to each of the designated environments associated with each Impact Level (IL) (i.e., CUI, Secret, TS/SCI and SAP). This scaling is pivotal to increasing enterprise-wide adoption of Digital Engineering methodologies that ultimately increase the efficiency of delivering capabilities to Space warfighters.</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1203010SF / <i>Space Force IT, Data Analytics, Digital Solutions</i>	Project (Number/Name) 645620 / <i>Digital Engineering</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>Develop and initiate training roadmaps and curriculum for the acquisition force and capability development partners that will increase overall enterprise digital proficiency. This training is key to decreasing the time it takes for acquisition professionals to become accustomed to standardized workflows and processes and software toolsets across different program offices and organizations within the Space Force.</p> <p>Onboard and employ force-multiplying tools and software to the USSF Digital Engineering Ecosystem MVP, developed both externally and within organizations across the DoD. By integrating these tools with the USSF Digital Engineering Ecosystem, programs will have the ability to continue any existing, specialized methods of acquisition agnostic to their respective programs, as well as to begin employing the use of tested and evaluated tools that are standard across Space Force acquisitions.</p> <p>Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased for non-pay and non-fuel inflation.</p>				
<p>Title: Science, Technology, and Research Studies</p> <p>Description: Funds research and studies on critical technology and international efforts to prevent strategic surprise while addressing Space Force current and emerging challenges in the space domain. S&T efforts in order to deter competitors and avoid technological strategic surprise. Incentivizes US and allies to create opportunities for natural deterrence. Advances space capability modeling.</p> <p>FY 2024 Plans: Partner with Massachusetts Institute of Technology (MIT) Artificial Intelligence (AI) Accelerator to fund six graduate scholars and one support contractor at MIT to advance artificial intelligence integration into Space Domain Awareness. Further, additional technical studies and research investigations will be accomplished based on findings from Space Futures workshops, Center for Naval Analysis reports, MIT Lincoln Lab research, and other sources which drive competition between government and FFRDC organizations to provide additional insights into resilient and assured space capabilities.</p> <p>FY 2025 Plans: Continue partnership with Massachusetts Institute of Technology (MIT) Artificial Intelligence (AI) Accelerator to fund six graduate scholars and one support contractor at MIT to advance artificial intelligence integration into Space Domain Awareness. Further, additional technical studies and research investigations will be accomplished based on findings from Space Futures workshops,</p>		0.000	4.822	6.038

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1203010SF / <i>Space Force IT, Data Analytics, Digital Solutions</i>	Project (Number/Name) 645620 / <i>Digital Engineering</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
Center for Naval Analysis reports, MIT Lincoln Lab research, and other sources which drive competition between government and FFRDC organizations to provide additional insights into resilient and assured space capabilities.			
Fund studies related to emerging technologies. Support interagency S&T partnerships focused on key space technology categories of overlapping interest among the partnership organizations. These efforts support continual development of space-based capabilities among the partnership organizations. This includes technology assessments as well as research coordination across multiple agencies operating in the space domain.			
Advance space capability modeling in the Bilateral Enterprise Analysis Model (BEAM) to support wargaming and analysis. Continue development of the USSF Space Enterprise Architecture Modeling to assess the ability of current and planned Space architectures to meet Combatant Command Joint Mission threads against current and future threats.			
<i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> FY 2025 increased for additional space capability modeling and non-pay and non-fuel inflation.			
Accomplishments/Planned Programs Subtotals	0.000	40.815	42.242

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

All contracts funded in this program element will be awarded using competitive procedures to the maximum extent possible. There will be numerous projects in which the program office will leverage rapid prototyping authorities to the maximum degree possible. The acquisition strategy leverages current contracts, Small Business Innovation Research (SBIR) and Indefinite Delivery - Indefinite Quantity (IDIQ) vehicles, and Other Transaction Agreements which were competitively awarded. Gaps in capability may require a new contract in FY 2024 based on lessons learned gathered during architecture refinement, market research and prototyping efforts closing out in early 1Q FY 2024. FY 2023 and FY 2024 Digital Engineering Ecosystem efforts prototype and demonstrate capability for the purpose of refining the acquisition strategy for an enduring solution for the Digital Engineering Ecosystem. Existing contracts or any necessary award to accommodate the USSF Digital Engineering Integrated Tech Stack, are scheduled to be in place by end of FY 2024. For the DEICE Tech Stack effort, Space Force plans to employ agile software development practices and techniques, such as flexible requirements, frequent user interaction, and rapid delivery. The program will acquire tools and capabilities through an agile-based Rapid Delivery Framework that: develops, integrates, and delivers new features and capabilities through 180-day program increments. Each DEE Prototype Demo further improves the MLS/CDS infrastructure and furthers digital engineering capabilities to accelerate and modernize Space Force capability development across all portfolios, as well as maturing emerging digital technologies. To deliver the cloud-based environment, contracts with cloud hosting, networking and data services providers will be utilized to provide: the software licenses, computer hosting, and cybersecurity. In addition, Federally Funded Research and Development Centers (FFRDCs) will provide expertise to develop required DE capabilities as well as optimizing the software configurations to support needed features. Finally, SBIR Phase 3

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1203010SF / <i>Space Force IT, Data Analytics, Digital Solutions</i>	Project (Number/Name) 645620 / <i>Digital Engineering</i>

contracts may be used to implement new DE capabilities based on industry best practices including: the management of the Product Backlog, assisting with on-boarding new programs, building training for new users, providing system administrative support, and creating scripts and features allowing DE activities to be automated.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force												Date: March 2024			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
3620F / 4				PE 1203010SF / Space Force IT, Data Analytics, Digital Solutions				645620 / Digital Engineering							
Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Digital Engineering MLS Prototyping	TBD	TBD : TBD	-	-		13.929	Apr 2024	10.770	Jan 2025	-		10.770	Continuing	Continuing	-
Digital Engineering Integration and Test	TBD	TBD : TBD	-	-		10.000	Jan 2024	14.644	Jan 2025	-		14.644	Continuing	Continuing	-
Science, Technology, and Research Studies	TBD	TBD : TBD	-	-		4.800	Oct 2024	6.038	Jan 2025	-		6.038	Continuing	Continuing	-
Security Accreditation	TBD	TBD : TBD	-	-		1.000	Jan 2024	3.000	Jan 2025	-		3.000	Continuing	Continuing	-
SE&I	TBD	TBD : TBD	-	-		5.000	Oct 2023	-		-		-	Continuing	Continuing	-
SBIR/STTR	TBD	TBD : TBD	-	-		1.254	May 2024	1.429	Jan 2025	-		1.429	Continuing	Continuing	-
Subtotal			-	-		35.983		35.881		-		35.881	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
IT Support	TBD	TBD : TBD	-	-		0.332	Oct 2024	0.465	Jan 2025	-		0.465	Continuing	Continuing	-
Subtotal			-	-		0.332		0.465		-		0.465	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
A&AS	TBD	TBD : TBD	-	-		3.000	Oct 2023	4.155	Jan 2025	-		4.155	Continuing	Continuing	-
FFRDC	RO	Various : Various	-	-		1.000	Oct 2023	1.741	Oct 2024	-		1.741	Continuing	Continuing	-
Other Support	TBD	TBD : TBD	-	-		0.500	Oct 2023	0.000	Oct 2024	-		0.000	Continuing	Continuing	-
Subtotal			-	-		4.500		5.896		-		5.896	Continuing	Continuing	N/A

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1203010SF / <i>Space Force IT, Data Analytics, Digital Solutions</i>	Project (Number/Name) 645620 / <i>Digital Engineering</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Digital Engineering				
IL-6 DEE MVP	1	2024	1	2025
TS/SCI DEE MVP	1	2024	3	2025
SAP DEE MVP	1	2024	4	2025
DEE Requirements/GRA Update #1/#2/#3/#4/#5/#6	1	2024	4	2026
Digital Thread/Data-Tool Integration	1	2024	2	2025
Contract Awards	2	2024	2	2025
DEE Prototype/Demo #1/#2/#3/#4/#5	3	2024	3	2026
DEE Integration Execution	2	2024	2	2028
DEE and DE Tool License Scaling	1	2025	4	2025
DEE MLS/CDS Test #1-3	3	2025	4	2026
DEE Security Accreditation	2	2024	2	2026
Science, Technology, and Research Studies				
Develop space capability modeling	1	2025	4	2028
Science, Technology, and Research Studies	1	2024	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 4					R-1 Program Element (Number/Name) PE 1203010SF / <i>Space Force IT, Data Analytics, Digital Solutions</i>				Project (Number/Name) 646017 / <i>SSC Developmental IT Infrastructure</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
646017: <i>SSC Developmental IT Infrastructure</i>	-	0.000	20.908	46.368	0.000	46.368	71.422	80.246	86.319	92.754	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 4, PE 1203010SF, project , USSF Integrated Operations Network (ION), is a new start.

A. Mission Description and Budget Item Justification

SSC Developmental IT Infrastructure supports the SSC Chief Information Office by implementing cybersecurity integration, a Cybersecurity Operations Center, Authorizing Official and Risk Management Framework cyber assessment team, Zero Trust, and supply chain risk management capabilities; and supports USSF with the Integrated Operations Network (ION) effort.

SSC efforts focus on developmental cybersecurity and supports cybersecurity policies and guidance, cyber resiliency capability development, vulnerability management, and program protection. SSC Developmental Cybersecurity helps assess technical risks associated with use, by understanding the System and Enterprise-level risks posed by threats based on deployment and gathered intelligence. The effort includes implementation of DoD cybersecurity policies and guidance such as DoD's Cyber Strategy, Zero Trust (ZT) Strategy, and other directives. This includes Research, Development, Test, and Evaluation (RDT&E) efforts for enabling ZT capabilities in Space Systems and implementation of SSC ZT Guidance and Policy via pilot programs for both legacy and future ground and space systems in accordance with Executive Order 14028 Improving the Nation's Cybersecurity, which requires federal agencies to establish plans to drive adoption of ZT Architecture. Additionally, the SSC Developmental Cybersecurity will deploy and enhance SSC's Supply Chain Risk Management (SCRM) capabilities through development of SCRM Artificial Intelligence and Machine Learning (AI/ML) tools that will illuminate and monitor the Space Defense Industrial Base and provide real-time risk analysis to the Program Executive Offices. The SSC Developmental Cybersecurity will analyze emerging Commercial Satellite Communication threats and provide publications to SSC, enhance the Infrastructure Asset Pre-Approval (IA-Pre) program which conducts on-site cyber compliance assessments, improves the security posture of commercial satellite communications services that SSC procures, and explore Space Spectrum sharing with commercial partners for added resiliency and cost reduction. The SSC Developmental Cybersecurity will stand up and bolster SSC's Approving Official and Risk Management Framework (RMF) capabilities, cybersecurity integration), and other vulnerability management and program protection efforts. The SSC Developmental Cybersecurity also furnishes internal management of requirements, funding, contract actions, and PM support/training relating to the SSC Chief Information Office.

USSF's ION will reduce technology debt and provide a secure, reliable, multi-classification data transport backbone across critical kill webs designed to defend against adversary operations. This ION communications backbone will provide high bandwidth with low latency for data transport. This effort will connect with the data platform, Unified Data Library, to ensure data exposure and dissemination occur using ION's resilient connectivity from sensors to C2 centers and tactical units. ION will integrate commercially-available IT capabilities to minimize government-unique tools. This effort will be resilient and agile against cyber threats to reduce attack vectors against multiple kill webs. FY25 efforts set conditions to scale and accelerate classified cloud infrastructure expansion in anticipation of projected threat timelines.

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1203010SF / <i>Space Force IT, Data Analytics, Digital Solutions</i>	Project (Number/Name) 646017 / <i>SSC Developmental IT Infrastructure</i>
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This program element may include necessary support required to ensure a cyber-secure and resilient IT infrastructure.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
<p>Title: USSF Integrated Operations Network (ION)</p> <p>Description: The ION will provide a secure, reliable, multi-classification transport layer to support space missions. ION will be a dynamic cloud-based software-defined mission network that integrates Space Force capabilities providing high bandwidth and low latency for essential capabilities including support to Artificial Intelligence (AI) and the Unified Data Library (UDL). The USSF Digital Engineering Ecosystem will be integrated into ION. Space Force discovered mission network infrastructure contained significant technology debt and is initiating ION to better prepare for Great Power Competition.</p> <p>FY 2024 Plans: N/A</p> <p>FY 2025 Plans: Develop a prototype hybrid agnostic transport and data interoperability to deliver software-defined mission architecture based on Space Force kill webs addressing potential adversary operations.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Increase of 24.985M between FY24 and FY25 is due to a transfer from Operations and Maintenance, Space Force, SAG 13C to RDT&E, Space Force PE 1203010SF, Project 646017 / SSC Developmental IT Infrastructure because the USSF pivoted from conducting a Spaceverse study effort to developing a classified network pathfinder named ION.</p>	-	0.000	24.985
<p>Title: SSC Developmental IT Infrastructure</p> <p>Description: SSC Developmental IT Infrastructure, is a USSF initiative that aims to drive effective, resilient, innovative, and cyber-secure solutions and IT across Space Systems Command, to meet warfighter and business needs.</p> <p>FY 2024 Plans: SSC Developmental IT Infrastructure plans to provide customers proper tools needed to accomplish their mission; these tools bring parity between personal and work-IT experiences to increase efficiency, efficacy, and workforce morale. The network infrastructure sector plans to implement Enterprise IT as a Service (EITaaS), zero-trust integration, and the Digital Engineering Environment (DEE) framework.</p> <p>SSC Developmental IT Infrastructure cybersecurity will execute various efforts to help assess technical risks associated with threats based on deployment and gathered intelligence. Those efforts include, but are not limited to, implementing: cybersecurity integration, a Cybersecurity Operations Center, a cyber assessment program, and vulnerability management program. The software sector aims to bring Software Agile and DevSecOps best practices as mainstream into acquisition; it plans to enable Platform and Infrastructure at scale based on mission thread needs. The SSC Developmental IT infrastructure plans to provide</p>	0.000	20.908	21.383

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1203010SF / <i>Space Force IT, Data Analytics, Digital Solutions</i>	Project (Number/Name) 646017 / <i>SSC Developmental IT Infrastructure</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>data exposure and "normalize" the data by aligning data strategies, scaling to include various entities, and deliver Dashboards for administration and mission support. The SSC Developmental IT Infrastructure will continue to support internal management of requirements, funding, contract actions, and PM support/training relating to the SSC Chief Information Office.</p> <p><i>FY 2025 Plans:</i> Continue prior year developmental efforts, to include development of SSC Cybersecurity policies and guidance, capability deployment, and pilot programs. After initial RDT&E efforts of ZT in FY 2024, further operational testing with various Program Executive Offices (PEO) such as Battle Management Command, Control & Communications (BMC3) and Space Domain Awareness and Combat Power (SDA & CP) will be conducted with the Space Control Network (SCN) and mesh-ONE T. Supply Chain Risk Management capabilities will be deployed to more Space Force program offices and can monitor the entire Space Force Industrial base with an estimated 20,000-30,000 suppliers. The Infrastructure Asset Pre-Approval (IA-Pre) program will continue development and commercial partnerships with the satellite communication industry for spectrum sharing will be secured and documented. Maintain support of SSC's Approving Official and Risk Management Framework (RMF) capabilities, cybersecurity integration, and other vulnerability management and program protection efforts. Furnish internal management of requirements, funding, contract actions, and PM support/training relating to the SSC Chief Information Office.</p> <p><i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> FY 2025 increase due to non-pay and non-fuel inflation</p>			
Accomplishments/Planned Programs Subtotals	0.000	20.908	46.368

C. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

D. Acquisition Strategy
SSC/CIO will utilize the most practical vehicle(s) and methods available within Federal Acquisition Regulation (FAR) and non-FAR contracts, agreements and solicitation methods. The CIO will utilize various pre-existing SSC SBIR and IDIQ vehicles to continue development of various enterprise solutions. For Zero Trust, a pre-existing Sequential SBIR Phase II is active and a follow-on SBIR Phase III for commercialization and operational deployment is anticipated. For SCRM, there is an ongoing SBIR Phase III contract that is supporting programs for Global Positioning System (GPS), Launch and Test Range System (LTRS), Evolved Strategic SATCOM (ESS), Overhead Persistent Infrared (OPIR), and SpaceWERX and follow-on SBIR Phase III efforts will be conducted to increase the ceiling in order to support more SSC program offices. For ZT and SCRM, competitive acquisitions and/or multi-award contracts are possible to onboard various capabilities available from industry to streamline deployment to SSC program offices. For commercial satellite communication studies, an ongoing 8(a) award has option CLINs the CIO is able to exercise until FY 2026.

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1203010SF / <i>Space Force IT, Data Analytics, Digital Solutions</i>	Project (Number/Name) 646017 / <i>SSC Developmental IT Infrastructure</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
SSC Developmental IT Infrastructure				
Add Requirements to Ongoing Contract Efforts	1	2024	4	2024
Technical Evaluation Assessment	1	2024	2	2024
Contract Award	3	2024	4	2024
SCRM Capability Scaled Deployment	3	2024	4	2025
SSC Dev Infrastructure Prototype/Demo #1/#2/#3	1	2025	4	2026
Infrastructure Integration Execution	3	2024	4	2028
Operational Test and Deployment	1	2025	4	2028
USSF ION				
Initiate ION development	1	2025	4	2028

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 1203164SF / NAVSTAR Global Positioning System (User Equipment) (SPACE)
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	787.541	370.354	353.807	300.025	0.000	300.025	134.068	0.000	0.000	0.000	0.000	1,945.795
643833: MILITARY GLOBAL POSITIONING SYSTEM USER EQUIP	787.541	370.354	353.807	300.025	0.000	300.025	134.068	0.000	0.000	0.000	0.000	1,945.795
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

Program MDAP/MAIS Code: 447

A. Mission Description and Budget Item Justification

The Global Positioning System (GPS) is a space-based radio Positioning, Navigation, and Timing (PNT) distribution system. GPS User Equipment (UE) consists of standardized receivers, antennas, antenna electronics, and other related equipment, grouped together in sets to derive navigation and time information transmitted from GPS satellites. These receiver sets are used by the Department of Defense (DoD). Research, Development, Test and Evaluation (RDT&E) funds UE development, integration, test, and analysis for new PNT receiver capabilities in Navigation Warfare (NAVWAR) across all military platforms using GPS services.

The Military Global Positioning System User Equipment (MGUE) Increment (Inc) 1 program is responsible for the development of standard modernized receiver form factors for the Service-nominated lead platforms. The MGUE Inc 1 Capability Development Document (CDD) was approved by the Joint Requirements Oversight Council (JROC) on 24 July 2014. MGUE Inc 1 is initiating a new family of modernized GPS receivers that will deliver significantly improved capability to counter current and emerging PNT threats and enable military operations in a NAVWAR environment where current legacy receiver performance would be compromised. MGUE Inc 1 received a Milestone A decision in April 2012. The program received direction in February 2014, from the Under Secretary of Defense for Acquisition, Technology, and Logistics (USD(AT&L)) to execute a new acquisition strategy, accelerating the program to provide test units faster to facilitate military end users. The MGUE program received a Milestone B decision in January 2017.

The MGUE Inc 2 effort will continue to expand Military-Code (M-Code) receiver technology into additional applications (space receivers and precision guided munitions), and develop a modernized Handheld (HH) device to meet Service requirements. This effort leverages the MGUE Inc 1 technology to the maximum extent while addressing the production of M-Code integrated circuits far into the future. The MGUE Inc 2 program is being executed in three parts: 1) Risk Reduction Activities, 2) Miniature Serial Interface (MSI) Receiver Card Middle Tier Acquisition (MTA) rapid prototyping, and 3) Joint Modernized GPS HH Receiver Middle Tier Acquisition rapid prototyping effort. The JROC approved the MGUE Inc 2 CDD on 6 April 2018. The Air Force Service Acquisition Executive approved the MGUE Inc 2 Acquisition Strategy to include designation of two MTA Rapid Prototype efforts: 1) MSI Receiver Cards to include Next-Generation (Next Gen) Application Specific Integrated Circuit (ASIC) and 2) Joint, Modernized HH Receiver.

The total cost of the Military GPS User Equipment Increment 2 Miniature Serial Interface Middle Tier of Acquisition effort is 1,532.5 million, including RDT&E and procurement of prototype units. The MGUE Inc 2 MSI program is not fully funded across the Future Years Defense Program. The Department of the Air Force is

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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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 1203164SF / NAVSTAR Global Positioning System (User Equipment) (SPACE)
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assessing all options to address the funding shortfalls for MTA programs including additional funding in a future budget request and performance trades based on technical maturity.

The total cost of the Military GPS User Equipment Increment 2 Joint Modernized Hand Held Middle Tier of Acquisition effort is 71.6 million, including RDT&E and procurement of prototype units. The MGUE Inc 2 JMHH RP program is fully funded across the Future Years Defense Program.

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

This 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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	381.394	353.807	299.499	0.000	299.499
Current President's Budget	370.354	353.807	300.025	0.000	300.025
Total Adjustments	-11.040	0.000	0.526	0.000	0.526
• 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	-8.881	0.000			
• Other Adjustments	-2.159	0.000	0.526	0.000	0.526

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
Title: Military Global Positioning System (GPS) User Equipment (MGUE) Increment (Inc) 1 Product Development	65.232	24.581	11.627
Description: The MGUE Inc 1 program develops standard modernized receiver form factors for the Service-nominated lead platforms in accordance with the MGUE Inc 1 CDD.			
FY 2024 Plans: Complete GPS Enterprise Engineering updates to GPS Receiver Application Module - Standard Electronic Module (GRAM-S/M). Conduct deficiency resolution for test problems resulting from lead platform testing. Complete Program Executive Officer (PEO) Certification of Readiness for B-2 and Navy Guided Missile Destroyer (DDG) Platform Operational Test and Evaluation (OT&E).			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>		R-1 Program Element (Number/Name) PE 1203164SF / NAVSTAR <i>Global Positioning System (User Equipment) (SPACE)</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
Continue program office and other related support activities that may include, but are not limited to studies, technical analysis, prototyping, etc. FY 2025 Plans: Complete contractor engineering support of B-2 combined Development Testing/Operational Testing (DT/OT) and DDG Platform OT&E. Complete Program Executive Officer (PEO) Certification of Readiness for B-2 Platform combined Developmental Test and Operational Test and Evaluation (OT&E). Continue deficiency resolution activities of lead platform test results. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities. FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to the completion of contractor GRAM-S/M and card level Development Testing (DT).				
Title: Advanced Technology Description: Advanced Technology/Pre-Tech includes efforts to mature technology for future GPS receivers identified in the MGUE CDDs. These efforts aim to find innovative solutions to increase resiliency in GPS performance and improve on size, weight, power, and cost (SWAP/C) of military receivers. FY 2024 Plans: Mature and test technologies and prototype demonstration systems that increase the robustness and resilience of Modernized GPS receivers and PNT system solutions. Implement required Request for Change modifications, including Regional Military Protection (RMP) and from an engineering perspective, extended Pseudorandom Noise (PRN) codes into the Modernized Protection Device (MoPD). Support the integration and security certification activities associated with implementing MoPD into a multi-GNSS software defined radio platform and continue to demonstrate the functional performance and flexibility of this security architecture. Continue multi-GNSS prototyping exploring the trustworthiness of "covered signals" to increase the resilience and capability of military PNT equipment and to meet applicable National Defense Authorization Act objectives. Continue working with US Special Forces and Foreign Military System (FMS) customers on supporting test, evaluation, and transition opportunities for the Military Underwater Navigation System with M-Code (MUNS-M). Complete the qualification testing and prototype fabrication of the Integrated M-Code/Antenna System (IMAS). FY 2025 Plans: Continue with the integration of MoPD into a multi-GNSS software defined radio platform. Support MGNSS receiver security certification activities, specifically related to RMP and extended PRN codes added capabilities. Build on FY 2024 multi-GNSS advancements in resilience and assurance algorithms by developing standard metrics and test methodologies that enable unique implementations to be compared / measured. Utilize algorithms implemented on Global Navigation Satellite System		5.717	7.816	12.492

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 Program Element (Number/Name) PE 1203164SF I NAVSTAR Global Positioning System (User Equipment) (SPACE)		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>Test Architecture (GNSSTA) as well as Open Service receivers for international partners to validate standard metrics and test methodologies. In coordination with international partners, perform platform integration and Anti-Jam (AJ) performance demonstration of IMAS on a Unmanned Aerial Vehicles (UAV) and/or Unmanned ground vehicles (UGV).</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased due to an increase in algorithm validation/implementation activity with international partners to demonstrate IMAS on a UAV or UGV.</p>				
<p>Title: MGUE Inc 1 System/Platform Integration and Performance Certification</p> <p>Description: Integration of MGUE Inc 1 receiver form factors into the Service-nominated lead platforms in support of developmental and operational (or field) test events. Conduct technical and operational modernization impact analysis for MGUE Service lead platform integration.</p> <p>FY 2024 Plans: Continue platform-level verification testing of the GRAM-S/M. Continue platform-level requirements verification and reliability test activities as required to include approved engineering changes. Complete B-2 and DDG integration and qualification efforts in support of developmental and operational or field test events. Complete B-2 combined developmental and operational test. Assist DoD integration of M-Code GPS receivers for joint Service non-lead platforms. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p>FY 2025 Plans: Complete B-2 & DDG platform integration and equipment installation to support DT/OT. Complete B-2 and DDG Platforms DT/OT efforts. Complete test data analysis and final reports.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to completing integration and qualification efforts on both the B-2 and DDG platforms.</p>		23.988	49.934	15.750
<p>Title: Information Assurance, Security/Compatibility Certification, and Test/Evaluation</p> <p>Description: Develop, implement, and maintain GPS security certification programs. Develop policy, strategy and resource requirements for MGUE security certification and compatibility certification. Security certification, compatibility certification, and security approval ensures future military GPS receivers protect critical program information and continue working in all environments and concepts of operations called for by U.S. Strategic Command.</p> <p>FY 2024 Plans:</p>		12.988	18.609	20.092

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1203164SF / NAVSTAR <i>Global Positioning System (User Equipment) (SPACE)</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Continue to conduct initial and delta security certification activities for all M-Code receivers, as required. Continue modernized security evaluations/tests for SAASM and other legacy GPS receiver equipment. Review, approve, and track Selective Availability Anti-Spoofing Module (SAASM), M-Code receivers, and legacy receiver certified platforms and integrated applications for all of DoD. Continue technical support to develop, validate and process engineering changes. Continue SAASM and modernize Key-Data Loading Installation Facility (KLIF) effort. The KLIF facilitates the programming of black key (cryptographic) algorithms into the SAASM to provide accurate positioning solutions for GPS users using secure equipment. Conduct GPS Enterprise Integrated System Test (IST) activities for MGUE lead platforms.</p> <p>FY 2025 Plans: Continue to conduct initial and delta security certification activities for all M-Code receivers, as required. Continue modernized security evaluations/tests for SAASM and other legacy GPS receiver equipment. Review, approve, and track SAASM, M-Code receivers, and certified legacy receiver certified platforms and integrated applications for all of DoD. Continue technical support to develop, validate and process engineering changes. Continue SAASM and modernize KLIF effort. The KLIF facilitates the programming of black key (cryptographic) algorithms into the SAASM to provide accurate positioning solutions for GPS users using secure equipment. Continue providing mobile Crypto Initialization Capability for SAASM receivers and develop mobile initialization capability for M-code receivers. Continue Military Standard Order certification for GPS Precise Positioning Service receivers for integration into aviation platforms. Military Standard Order program provides equivalent Federal Aviation Administration certification for GPS Precise Positioning Service receivers. Continue GPS Enterprise IST activities for MGUE program. Continue integration and testing of MGUE Inc 2 MSI ASIC. Conduct MGUE Inc 2 HH ASIC early Integration and Testing. Continue to provide Military Standard Order support to portfolio of airborne GPS receiving programs.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased due to MGUE Inc 2 transition to Integration and Testing.</p>			
<p>Title: MGUE Inc 2 Risk Reduction</p> <p>Description: The MGUE Inc 2 program will develop M-Code receiver technology to meet Service requirements. MGUE Inc 2 Risk Reduction activities include, but are not limited to, acquisition strategy development, early design efforts through Preliminary Design Review (PDR) for the next generation Application Specific Integrated Circuit (ASIC) using 14nm (nanometer) ASIC technology node, handheld design activities and early user demonstrations, advanced concept studies, receiver component prototyping to include MGUE Inc 2 requirements.</p> <p>FY 2024 Plans: N/A</p> <p>FY 2025 Plans:</p>	2.671	0.000	0.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>		R-1 Program Element (Number/Name) PE 1203164SF / NAVSTAR <i>Global Positioning System (User Equipment) (SPACE)</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
N/A				
FY 2024 to FY 2025 Increase/Decrease Statement: N/A				
Title: MGUE Inc 2 Miniature Serial Interface (MSI) Receiver Card Rapid Prototyping		254.440	235.541	218.469
Description: The MGUE Inc 2 program will develop M-Code receiver technology for additional applications (space receivers, precision guided munitions, and handheld receivers) to meet Service requirements. MGUE Inc 2 MSI Receiver Card Rapid prototyping builds on the ASIC post-Preliminary Design Review (PDR) progress and will develop, integrate, produce, and test M-Code capable, low size and power GPS MSI form factor to include a Next Gen ASIC. The MSI receiver card is to meet the needs of low size, weight and power (SWaP) ground-embedded users. However, the Next Gen ASIC must meet the needs of the MSI form factor and be backwards compatible with Inc 1 performance requirements as a potential functional replacement due to Inc 1 ASIC obsolescence. MGUE Inc 2 MSI Receiver Card Rapid Prototyping has been broken out into a separate effort for additional visibility.				
FY 2024 Plans: Continue two development contracts for new low size/power MSI receiver card to include Next Gen ASIC, hardware, and software. Continue efforts related to the prototypes including, but not limited to, ordering of components for early integrated testing, long-lead parts planning and purchase, procurement of test equipment and articles, manufacturing prototypes, and manpower. Complete First Test Article (FTA) and Proof of Design (POD) for all vendors. Assess ASIC viability and determine whether a respin is required. Contractors will continue to verify performance requirements are met through demonstrations and testing. Continue security certification and design validation activities. Continue investments in core ASIC technology, early ASIC fabrication, manufacturing and Intellectual Property procurement. Continue MSI rapid prototyping through intellectual property maturation. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.				
FY 2025 Plans: Continue two development contracts for new low size/power MSI receiver card to include Next Gen ASIC, hardware, and software. Continue efforts related to the prototypes including, but not limited to, ordering of components for early integrated testing, long-lead parts planning and purchase, procurement of test equipment and articles, manufacturing prototypes, and manpower. If necessary, complete ASIC respin. Complete First Test Article (FTA) and Proof of Design (POD) for all vendors. Continue efforts to complete security certification, formal MSI Functional Qualification Test, and Functional Configuration Audit/ Physical Configuration Audit activities. Complete development of the receiver form factor with next gen ASIC. Continue MSI rapid prototyping through intellectual property maturation. Rapidly respond to implement system resiliency and situational awareness				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 Program Element (Number/Name) PE 1203164SF I NAVSTAR Global Positioning System (User Equipment) (SPACE)		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 funding decreased due to transition from FY 2024 vendor completion of FTA, to test activities in FY 2025.</p>				
<p>Title: MGUE Inc 2 Handheld</p> <p>Description: The MGUE Inc 2 HH effort will develop a joint common modernized HH receiver that will provide M-code, anti-spoof, and anti-jam capabilities, with significant improvements in size, weight, and power. The goal of the MGUE Inc 2 HH risk reduction activities is to reduce development risk for the MGUE Inc 2 HH receiver through feedback from the rapid prototyping process and multiple joint service demonstration events. Transition HH risk reduction activities to a MTA Rapid Prototyping effort in line with the Service Acquisition Executive (SAE)-approved MGUE Inc 2 Acquisition Strategy.</p> <p>FY 2024 Plans: Continue the HH MTA Rapid Prototyping effort in line with the 2018 SAE-approved MGUE Inc 2 Acquisition Strategy. Continue to develop the Ground Application Technical Requirement Document (TRD)-compliant prototype that will be M-Code capable and ready for security approval. Continue to conduct Joint service demonstration events to inform HH development, burning down user acceptance risk. Continue to integrate MSI technology into the HH advanced prototype; continue to perform limited operational testing, security testing and power model analysis. Analyze prototype manufacturing, hardware, software, and critical component completeness in support of the initial product baseline. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities include, but are not limited to, program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p>FY 2025 Plans: Continue the HH MTA Rapid Prototyping effort in line with the 2018 SAE-approved MGUE Inc 2 Acquisition Strategy. Continue to develop the Ground Application TRD-compliant prototype that will be M-Code capable and ready for security approval. Continue to conduct Joint service demonstration events to inform HH development, burning down user acceptance risk. Continue to integrate MSI technology into the HH advanced prototype via testing hardware/software, proprietary message sets, key loading, zeroization, etc.; continue to perform limited operational testing, security testing and power model analysis. Continue to support Technology Advancement Group (TAG) as they conduct Functional Qualification Testing (FQT) activities. Complete HH Objective C and award HH Objective C Option contract. Analyze prototype manufacturing, hardware, software, and critical component completeness in support of the initial product baseline. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement:</p>		5.318	17.326	21.595

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 1203164SF / NAVSTAR Global Positioning System (User Equipment) (SPACE)
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
FY 2025 increased due to MSI first test article and HH prototype integration activities.			
Accomplishments/Planned Programs Subtotals	370.354	353.807	300.025

D. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
• SPSF 01 GPSSPC: <i>Global Positioning (Space)</i>	0.947	0.893	0.835	-	0.835	0.883	0.834	0.852	0.870	0.000	6.114

Remarks
Procurement, Space Force (PSF) funding in this PE supports legacy SAASM efforts. Similar work for the MGUE is in the planning phase.

E. Acquisition Strategy
The MGUE program has developed a comprehensive acquisition strategy to provide modernized GPS capabilities to U.S. and Allied Forces by developing a competitive market driven approach. This strategy establishes the signal compatibility and security criteria along with a process for evaluating components to enable rapid movement from development to fielding. The pillars of this effort are: (a) establishing time certain and low risk development; (b) bounding requirements to leverage mature technology to the maximum extent possible; (c) focusing on the development of form factors based on well-defined standards to support lead platform integration; and (d) implementing a proactive, collaborative MGUE platform integration activity to mitigate risk and reduce cost for DoD force structure modernization.

The MGUE program awarded three sole source contracts for the Inc 1 Technology Development Phase effort in September 2012, as follow-on efforts to the competitively awarded Modernized User Equipment (MUE) contracts awarded in June 2006. The effort spans the Technology Maturation and Risk Reduction Phase through design and includes integration and test of M-Code receivers into Service-nominated lead platforms. In 1QFY2021, the program office converted the remaining Raytheon GRAM-S/M development effort to a Firm Fixed Price contract type at the direction of the Air Force Service Acquisition Executive. The contracts of the other two vendors remain primarily a Cost Plus Incentive Fee type contract. This effort also includes the security and compatibility certification of GPS receiver cards as a part of the integration effort. The Service lead platforms will select from the available vendors to integrate and perform operational testing with funding from the MGUE program. This supports compliance with PL 111-383, section 913.

The MGUE Inc 2 program developed an Acquisition Strategy to continue MGUE development by: addressing long term producibility of MGUE ASICs, identifying a U.S. owned trusted foundry for ASIC development, delivering GPS receiver cards to meet stringent Inc 2 requirements, and developing a modernized GPS handheld receiver to meet the needs of the Services. The MGUE Inc 2 program is being executed in three parts: 1) Risk Reduction Activities, 2) MSI MTA rapid prototyping, and 3) Joint Modernized GPS Handheld Receiver MTA rapid prototyping effort. The Air Force SAE approved the MGUE Inc 2 Acquisition Strategy to include designation of two MTA Rapid Prototype efforts: 1) MSI Receiver Card (includes Next-Gen ASIC) and 2) Joint, Modernized Handheld Receiver. MGUE Inc 2 awarded three full and open competitive contracts in Nov 2020 for MSI. Due to a bilaterally negotiated contract modification, one vendor's Period of Performance completed in November 2023. The

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity
3620F: *Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)*

R-1 Program Element (Number/Name)
PE 1203164SF / *NAVSTAR Global Positioning System (User Equipment) (SPACE)*

program office awarded the Handheld contract in fourth quarter FY 2023. The government is currently planning the transition of the MSI development out of MTA Rapid Prototype acquisition pathway with an MDA decision expected in 2024.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1203164SF / NAVSTAR Global Positioning System (User Equipment) (SPACE)	Project (Number/Name) 643833 / MILITARY GLOBAL POSITIONING SYSTEM USER EQUIP
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MGUE Inc 1 Technology Development (1)	C/CPIF	Collins Aerospace : Cedar Rapids, IA	8.111	0.496	Nov 2022	-		-		-		-	0.000	8.607	-
MGUE Inc 1 Technology Development (2)	C/CPIF	Raytheon : El Segundo, CA	92.326	45.022	Nov 2022	10.788	Nov 2023	-		-		-	0.000	148.136	-
MGUE Inc 1 Technology Development (3)	C/CPIF	L3 Harris : Anaheim, CA	1.000	0.354	Nov 2022	-		-		-		-	0.000	1.354	-
MGUE Inc 1 Platform Integration	Various	Various : Various	35.319	31.770	Nov 2022	49.960	Nov 2023	18.959	Nov 2024	-		18.959	0.000	136.008	-
MGUE Inc 1 Information Assurance	Various	Various : Various	2.707	-		-		-		-		-	0.000	2.707	-
MGUE Inc 1 Technical Mission Analysis	Various	Aerospace/MITRE : Various	9.168	1.142	Nov 2022	0.861	Nov 2023	0.885	Nov 2024	-		0.885	0.000	12.056	-
MGUE Inc 1 Enterprise SE&I	C/CPAF	SAIC : El Segundo, CA	4.998	1.261	Dec 2022	3.180	Dec 2023	0.342	Dec 2024	-		0.342	0.000	9.781	-
MGUE Advanced Technology/Pre-Tech	Various	Various : Various	12.696	5.717	Jan 2023	7.816	Jan 2024	12.492	Jan 2025	-		12.492	Continuing	Continuing	-
MGUE Inc 2 MSI Receiver Card Rapid Prototyping	Various	Various : Various	106.852	8.362	Dec 2022	19.468	Dec 2023	9.523	Dec 2024	-		9.523	Continuing	Continuing	-
MGUE Security Certification	Various	Various : Various	15.275	7.166	Nov 2022	8.611	Nov 2023	6.672	Nov 2024	-		6.672	Continuing	Continuing	-
MGUE Inc 2 Technology Development (1)	C/CPIF	BAE Systems : Cedar Rapids, IA	106.261	77.224	Nov 2022	109.774	Nov 2023	84.856	Nov 2024	-		84.856	Continuing	Continuing	-
MGUE Inc 2 Technology Development (2)	C/CPIF	L3 Harris : Anaheim, CA	86.997	50.565	Nov 2022	48.486	Nov 2023	65.279	Nov 2024	-		65.279	Continuing	Continuing	-
MGUE Inc 2 Technology Development (3)	C/CPIF	Raytheon : El Segundo, CA	123.724	67.636	Nov 2022	0.000	Nov 2023	-		-		-	Continuing	Continuing	-
MGUE Inc 2 Risk Reduction	Various	Various : Various	75.714	2.671		-		-		-		-	0.000	78.385	-
MGUE Inc 2 Information Assurance	Various	Various : Various	2.963	3.029	Nov 2022	4.660	Nov 2023	4.180	Nov 2024	-		4.180	Continuing	Continuing	-
MGUE Inc 2 Handheld	C/FFP	Technology Adv. Group : Ashburn, VA	0.000	5.318	Nov 2022	15.175	Nov 2023	15.383	Nov 2024	-		15.383	Continuing	Continuing	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1203164SF / NAVSTAR Global Positioning System (User Equipment) (SPACE)	Project (Number/Name) 643833 / MILITARY GLOBAL POSITIONING SYSTEM USER EQUIP
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MGUE Inc 2 Technical Mission Analysis	Various	Aerospace/MITRE : El Segundo, CA	19.112	13.879	Nov 2022	8.924	Nov 2023	10.397	Nov 2024	-		10.397	Continuing	Continuing	-
MGUE Inc 2 Enterprise SE&I	C/CPAF	SAIC : El Segundo, CA	7.698	2.277	Jan 2023	5.279	Jan 2024	5.119	Jan 2025	-		5.119	Continuing	Continuing	-
MGUE Inc 1 and Inc 2 SBIR/STTR	Allot	TBD : TBD	0.000	-		12.651		10.799		-		10.799	Continuing	Continuing	-
Subtotal			710.921	323.889		305.633		244.886		-		244.886	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MGUE Inc 1 Test and Evaluation	Various	Various : Various	1.312	-		0.356	Jan 2024	-		-		-	0.000	1.668	-
MGUE Inc 2 Test and Evaluation	Various	Various : Various	7.200	2.792	Jan 2023	6.147	Jan 2024	14.592	Jan 2025	-		14.592	Continuing	Continuing	-
Subtotal			8.512	2.792		6.503		14.592		-		14.592	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MGUE Inc 1 FFRDC	RO	Aerospace/MITRE : El Segundo, CA	11.007	2.131	Dec 2022	1.593	Dec 2023	1.637	Dec 2024	-		1.637	1.367	17.735	-
MGUE Inc 2 FFRDC	RO	Aerospace/MITRE : El Segundo, CA	12.469	7.046	Dec 2022	12.599	Dec 2023	12.162	Dec 2024	-		12.162	Continuing	Continuing	-
MGUE Inc 1 A&AS	Various	Various : Various	24.740	6.844	Dec 2022	4.896	Dec 2023	4.420	Dec 2024	-		4.420	3.434	44.334	-
MGUE Inc 2 A&AS	Various	Various : Various	19.350	27.106	Dec 2022	22.052	Dec 2023	21.940	Dec 2024	-		21.940	Continuing	Continuing	-
MGUE Inc 1 and Inc 2 Other Support	Various	Various : El Segundo, CA	0.542	0.546	Oct 2022	0.531	Oct 2023	0.388	Oct 2024	-		0.388	0.150	2.157	-
Subtotal			68.108	43.673		41.671		40.547		-		40.547	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force							Date: March 2024				
Appropriation/Budget Activity 3620F / 4			R-1 Program Element (Number/Name) PE 1203164SF / NAVSTAR Global Positioning System (User Equipment) (SPACE)				Project (Number/Name) 643833 / MILITARY GLOBAL POSITIONING SYSTEM USER EQUIP				
	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals	787.541	370.354	353.807	300.025	-	300.025	Continuing	Continuing	N/A		

Remarks
 FINANCIAL PERFORMANCE: MGUE Inc 1 and Inc 2 is evaluated against traditional Research and Development (R&D) program expenditure benchmarks. Unlike many traditional R&D programs, however, the MGUE Inc 1 and Inc 2 contracts are FPIF contracts with progress payments. 10 percent of incurred costs are withheld until the end of the contract, when they are liquidated. Mandatory funding obligations and progress payment withholds will cause the program to lag traditional expenditure benchmarks, painting an inaccurate portrait of overall program execution health.

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1203164SF / NAVSTAR Global Positioning System (User Equipment) (SPACE)	Project (Number/Name) 643833 / MILITARY GLOBAL POSITIONING SYSTEM USER EQUIP

	FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
MGUE Increment 1																												
MGUE Inc 1 Developmental & Modernization	██████████																											
MGUE Inc 1 Development Test	██████████																											
MGUE Inc 1 DDG Card level PEO Certification	██████████				██████████																							
MGUE Inc 1 B-2 Card level PEO Certification	██████████				██████████																							
MGUE Inc 1 Lead Platform Integration and Test	██████████				██████████																							
Advanced Technology/Pre-Tech																												
ADV/Pre-Tech MoPD Security Certification Testing, Implement RFCs, and Integration into M-GNSS SDR Platforms					██████████																							
ADV/Pre-Tech IMAS TRD System fabrication and conduct design validation testing	██████████				██████████																							
ADV/Pre-Tech MUNS-M software and displays maturation	██████████				██████████																							
ADV/Pre-Tech IMAS Transition opportunities / Evaluation					██████████				██████████																			
ADV/Pre-Tech IMAS Platform Transition / Evaluation					██████████				██████████																			
MoPD follow on RFC implementation & vendor integration support													██████████															
MGUE Increment 2																												
MGUE Inc 2 Risk Reduction Transfer to Handheld Activities	██████████																											
MGUE Inc 2 MSI Receiver Card w/Next Gen ASIC Rapid Prototyping	██████████				██████████																							

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1203164SF / NAVSTAR Global Positioning System (User Equipment) (SPACE)	Project (Number/Name) 643833 / MILITARY GLOBAL POSITIONING SYSTEM USER EQUIP
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	FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

MGUE Inc 2 M-Code & Legacy Receiver Security Certification																												
MGUE Inc 2 Critical Design Review																												
MGUE Inc 2 Modernized Handheld Receiver																												
MGUE Inc 2 Handheld Objective C Base																												
MGUE Inc 2 Handheld Objective C Option																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1203164SF / NAVSTAR Global Positioning System (User Equipment) (SPACE)	Project (Number/Name) 643833 / MILITARY GLOBAL POSITIONING SYSTEM USER EQUIP

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
MGUE Increment 1				
MGUE Inc 1 Developmental & Modernization	1	2023	3	2023
MGUE Inc 1 Development Test	1	2023	4	2023
MGUE Inc 1 DDG Card level PEO Certification	1	2023	4	2024
MGUE Inc 1 B-2 Card level PEO Certification	1	2023	2	2025
MGUE Inc 1 Lead Platform Integration and Test	1	2023	2	2025
Advanced Technology/Pre-Tech				
ADV/Pre-Tech MoPD Security Certification Testing, Implement RFCs, and Integration into M-GNSS SDR Platforms	4	2023	3	2025
ADV/Pre-Tech IMAS TRD System fabrication and conduct design validation testing	2	2023	2	2025
ADV/Pre-Tech MUNS-M software and displays maturation	2	2023	3	2025
ADV/Pre-Tech IMAS Transition opportunities / Evaluation	4	2023	2	2026
ADV/Pre-Tech IMAS Platform Transition / Evaluation	3	2024	1	2027
MoPD follow on RFC implementation & vendor integration support	4	2025	3	2027
MGUE Increment 2				
MGUE Inc 2 Risk Reduction Transfer to Handheld Activities	1	2023	4	2023
MGUE Inc 2 MSI Receiver Card w/Next Gen ASIC Rapid Prototyping	1	2023	1	2026
MGUE Inc 2 M-Code & Legacy Receiver Security Certification	1	2023	4	2026
MGUE Inc 2 Critical Design Review	3	2023	4	2023
MGUE Inc 2 Modernized Handheld Receiver	3	2023	4	2026
MGUE Inc 2 Handheld Objective C Base	3	2023	3	2025
MGUE Inc 2 Handheld Objective C Option	3	2025	4	2026

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1203622SF / <i>Space Warfighting Analysis</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	42.300	95.541	121.409	0.000	121.409	119.523	123.395	127.597	130.137	Continuing	Continuing
646021: <i>Space Warfighting Analysis Center (SWAC)</i>	-	42.300	95.541	121.409	0.000	121.409	119.523	123.395	127.597	130.137	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This request funds increased scope towards capability area analyses and integration, modeling, wargaming, and experimentation to create operational concepts and force design guidance for existing and emerging USSF missions. Capability Area design analyses identify the integrated suite of operational capabilities that fulfills USSF imperatives to preserve the United States' freedom of action in space; enables Joint Force lethality and effectiveness; and provides the Service options for developing capabilities operating in, from, and to space. These analyses efforts team with relevant stakeholders across the National Security Space enterprise from an independent perspective and will provide analytic insight to the Service to inform and/or validate solutions to operational needs and provide a basis for future capability development programs. USSF force design analyses are organized into three main focus areas: Multi-Domain Sensing, Spectrum Warfare, and Force Design Integration which are aligned to USSF priorities, and follow a disciplined approach to discover, analyze, and validate concepts and the associated family of systems required to satisfy current/future mission needs while including comprehensive threat analysis. The resulting force design products will help define and inform future USSF mission requirements, capabilities/architectures, priorities, funding needs, and interface standards.

This program element may include necessary emergent/unanticipated civilian pay expenses required to manage and execute the force design mission assigned to the SWAC and/or deliver products for evolving weapon system capabilities.

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.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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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 1203622SF / Space Warfighting Analysis
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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	42.300	95.541	116.317	0.000	116.317
Current President's Budget	42.300	95.541	121.409	0.000	121.409
Total Adjustments	0.000	0.000	5.092	0.000	5.092
• 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	5.092	0.000	5.092

Change Summary Explanation

FY 2025: +\$5.092M; realignment of civilian pay from BA06 to consolidate all funds under the same budget activity.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
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Title: Space Warfighting Analysis Center (SWAC)	42.300	95.541	121.409
Description: Space Warfighting Analysis Center is the foundational element to develop and provide authoritative Force Design recommendations for the United States Space Force (USSF).			
FY 2024 Plans: Expand research studies, system design analysis, and wargaming integration prototyping demonstrations across a variety of domains and mission areas to inform USSF force designs. The Multi-Domain Sensing Program focus areas are: Moving Target Indicator (MTI), Missile Warning, Tracking, and Defense (MWTDD), and Kill Chain Analysis. MTI will analyze merging multiple sensing phenomenologies to directly support joint warfighter needs. MWTDD will analyze the performance characteristics of current and planned Missile Warning systems in expanded armed conflict scenarios. Kill Chain Analysis will investigate requirements and alternatives to support joint warfighting needs. The Spectrum Warfare Program focus areas are: Space Data Network, Ground Data Network, Position, Timing, and Navigation and Force Design Validation. Space Data Network analyses will focus on broadband, narrowband, and space to space cross link to assess kill chains, commercial services, and hybrid electromagnetic compatibility network studies. Ground Data Network will study Ground Entry Point architecture for space network and Data Transmit and Receive Network support of high-altitude mesh. Positioning, Timing, and Navigation will seek to define baseline architecture for ground, space and communications and evaluate User Equipment coupling between communications and Positioning, Timing, and Navigation receivers. Validation efforts will focus on collaborating with the community on prototypes and experiments for Space Warfighting Analysis Center Force Design key questions. The Force Design Integration Office will			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1203622SF / <i>Space Warfighting Analysis</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>continue to lead joint and analytic integration and Force Design conference activities. Funds will also enable execution of mission support areas that are required for daily operations.</p> <p><i>FY 2025 Plans:</i> Expand research studies, system design analysis, and wargaming integration prototyping demonstrations across a variety of domains and mission areas to inform USSF force designs. The Multi-Domain Sensing Program will update MTI analysis findings and initiate an MTI ground system study; expand the Kill Chain analysis to address additional joint needs; assess emerging MWTD targets, threats, and enhanced sensing concepts; and begin a Space Based Environmental Monitoring Force Design study. The Spectrum Warfare focus areas will continue developing the Government Reference Architectures and Capability Area designs for Broadband, Narrowband, and Space to Space Force Designs, and will work on moving into space-based Position, Navigation, and Timing (PNT) Force Designs with deeper inclusion into kill-webs. Additionally, Spectrum Warfare will continue to study Ground Entry Point architecture for space network and Data Transmit and Receive Network support of high-altitude mesh for Ground Data Network Force Designs, and begin developing a blueprint and Force Designing for Nuclear Command, Control, and Communications. The Joint Sensitive Space Staff (JS3) will continue to conduct modeling, simulation and analysis of satellite signatures to include sensing, communications and offensive and defensive space operations. The JS3 will also analyze thresholds of detectability and provide concept of operations and tactics recommendations to inform future capabilities. Funds will also enable execution of mission support areas that are required for daily operations.</p> <p><i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> The funding increase enables ongoing analyses to continue towards validation stages and provides the ability to scale operations to meet increasing demands of the USSF, DoD partners and allies.</p>			
Accomplishments/Planned Programs Subtotals	42.300	95.541	121.409

D. Other Program Funding Summary (\$ in Millions)
N/A

Remarks
N/A

E. Acquisition Strategy
SWAC collaborates with stakeholders and mission partners to access appropriate and existing contract vehicles to focus resources on USSF mission priorities.

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1203622SF / <i>Space Warfighting Analysis</i>	Project (Number/Name) 646021 / <i>Space Warfighting Analysis Center (SWAC)</i>

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Space Warfighting Analysis Center (SWAC)	
Multi-Domain Sensing Program (MDSP) - Missile Warning/Missile Tracking (MW/MT)	
MDSP - Kill Chain Analysis	
MDSP - Moving Target Indicators	
MDSP - Space Based Environmental Monitoring	
Spectrum Warfare Program (SWP) - Space Data Network	
SWP - Navigation Warfare and Position, Navigation & Timing (PNT)	
SWP - Ground Data Network	
SWP - Space Logistics (may include launch and on-orbit servicing)	
Force Design Integration (FDI) - Concepts & Wargaming	
FDI - Programming, Planning and Cost Analysis	
FDI - Chief of Space Operations' Force Design Guidance, Capability Area Designs, and Force Design Conferences	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1203622SF / <i>Space Warfighting Analysis</i>	Project (Number/Name) 646021 / <i>Space Warfighting Analysis Center (SWAC)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Space Warfighting Analysis Center (SWAC)				
Multi-Domain Sensing Program (MDSP) - Missile Warning/Missile Tracking (MW/MT)	1	2023	4	2029
MDSP - Kill Chain Analysis	1	2023	4	2029
MDSP - Moving Target Indicators	1	2023	4	2029
MDSP - Space Based Environmental Monitoring	1	2025	4	2029
Spectrum Warfare Program (SWP) - Space Data Network	1	2023	4	2029
SWP - Navigation Warfare and Position, Navigation & Timing (PNT)	1	2023	4	2028
SWP - Ground Data Network	1	2024	4	2028
SWP - Space Logistics (may include launch and on-orbit servicing)	1	2025	4	2029
Force Design Integration (FDI) - Concepts & Wargaming	1	2023	4	2029
FDI - Programming, Planning and Cost Analysis	1	2023	4	2029
FDI - Chief of Space Operations' Force Design Guidance, Capability Area Designs, and Force Design Conferences	1	2023	4	2029

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 1203710SF I EO/IR Weather Systems
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	87.195	95.615	76.391	0.000	76.391	80.322	81.976	84.936	86.611	0.000	593.046
643730: EO/IR Weather System Dev	-	87.195	95.615	76.391	0.000	76.391	80.322	81.976	84.936	86.611	0.000	593.046
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

In compliance with the 2015, 2016, 2017, and 2020 National Defense Authorization Act (NDAA) and Joint Requirements Oversight Council (JROC) Memos 092-14, 062-17, and 031-22, EWS will provide global Low-Earth Orbit (LEO) coverage to meet Space-Based Environmental Monitoring (SBEM) Electro-Optical/Infrared (EO/IR) Gaps 1) Cloud Characterization (CC) and 2) Theatre Weather Imagery (TWI). This capability will operationally replace the obsolete and aging Defense Meteorological Satellite Program (DMSP) projected end-of-life June 2026, and the EWS-Geostationary (EWS-G) projected end-of-life Sept 2030. Without the CC and TWI data, production of global predictive weather data will be severely impacted, affecting daily air operations and intelligence gathering for strategic mission planning. Moreover, INDOPACOM, CENTCOM, and AFRICOM will be unable to forecast and monitor adverse weather conditions over eastern Africa and the Indian Ocean. Lastly, the US will not meet the DoD responsibility of maintaining the SBEM civil/international partnership for the Family of Systems architecture.

Based on SBEM Capability Assessment and Strategy Review (CASR) in April 2019, the current EWS acquisition strategy focuses on a distributed LEO architecture, for scalability and increased operational resilience. The Space Force will pursue prototyping of latest industry capabilities for simplified sensor designs, while meeting CC and TWI requirements and data latencies in a distributed architecture.

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

This 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.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 1203710SF I EO/IR Weather Systems
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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	86.519	95.615	78.458	0.000	78.458
Current President's Budget	87.195	95.615	76.391	0.000	76.391
Total Adjustments	0.676	0.000	-2.067	0.000	-2.067
• 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	-2.924	0.000			
• Other Adjustments	3.600	0.000	-2.067	0.000	-2.067

Change Summary Explanation

FY 2023: -2.924M for SBIR/STTR transfer

FY 2023: +3.6M for inflation adjustment

FY 2024: -0.630M to realign funding to APPN 3410, PE 1207804SF (SAG 13C), for fiscal policy compliance as Space Systems Command (SSC) establishes Headquarters functions and a Chief Information Office (CIO) for integrated cybersecurity.

FY 2025: -.020M for higher priorities

FY 2025: The FY 2025 funding request was reduced by \$2.2 million to account for the availability of prior year execution balances.

C. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Electro-Optical/Infrared Weather System (EWS)	87.195	95.615	76.391	0.000	76.391
Description: EWS will focus on an overlapping multi-phased approach intended to mature multi-spectral imaging capabilities to collect and disseminate terrestrial atmospheric phenomena to support Department of Defense (DoD) operations. Primary effort will focus on competitive prototyping of the latest industry sensor and bus designs, development, integration, test, launch and successful on-orbit demonstrations. This effort will also assess current industrial capability to deliver CC and TWI data in a viable commercial service business, hosted on a proliferated LEO mesh network. Program will minimize technology maturity risks by evaluating multiple, competitive EO/IR sensors, satellite vehicle prototypes and commercial services in order to inform a decision on a cost-effective system or service to replace the legacy DMSP constellation and EWS-G in a timely manner. Per the approved EWS Acquisition Strategy, the Program Office will continue to competitively prototype sensor and bus designs for a proliferated-LEO architecture while leveraging the existing SBEM Family of Systems (Phase II), and on-ramp to an operational system (Phase III) based on the success of Phase II in time to operationally					

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1203710SF / <i>EO/IR Weather Systems</i>
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C. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
<p>replace DMSP and EWS-G at their end of life. Leveraging the success of these efforts, the Program Office intends to field an affordable and highly capable operational replacement system in Phase III.</p> <p>FY 2024 Plans: For Phase II Modernized Pathfinder efforts: For the additional Orion Space Solutions Technology Demonstration, complete associated space vehicle and launch vehicle integration, on-orbit calibration and check-out, and technology demonstration. Assess prototype microbolometer performances in Early Morning Orbit and feed results to Phase III operational system acquisition strategy.</p> <p>For Increment 0 Operational Demonstrations: continue Operational Demonstration #1 build, Integration & Test (I&T) activities in preparation for an FY 2025 launch. Begin pre-acquisition activities and execute contract award of Operational Demonstration #2. Prepare for Acquisition Strategy decision in FY 2025 to support Phase III Operational Replacement definition.</p> <p>Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p>FY 2025 Base Plans: For Phase II Modernized Pathfinder efforts: For the second Orion Space Solutions Technology Demonstration, complete on-orbit assessment of microbolometer performances in Early Morning Orbit. The results will inform Phase III operational replacement strategy.</p> <p>For Increment 0 Operational Demonstrations: Complete demonstration #1 build, Integration & Test (I&T), and launch activities. Continue demonstration #2 complete design activities and begin build, integration and test. Progress will inform Phase III operational replacement strategy.</p> <p>Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2025 OCO Plans:</p>					

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1203710SF / <i>EO/IR Weather Systems</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
N/A					
<i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> FY 2025 to have a slight decrease due to completion of Phase II 2nd on-orbit technology demonstration of Orion Space Solution Technology Demonstration and ramping down of build, integration and test of Phase II Operational Demonstration prototype #1, while picking up pace on Ops Demo #1 launch activities and acquisition of Ops Demo #2.					
Accomplishments/Planned Programs Subtotals	87.195	95.615	76.391	0.000	76.391

D. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

E. Acquisition Strategy

In accordance with the approved SBEM Acquisition Strategy (Sep 2020), the Space Force will continue to address Joint SBEM gaps with a combination of DoD materiel and non-materiel solutions, partnerships, and commercial, civil, and allied data. EWS will continue to use Other Transaction Authority (OTA) to competitively pursue a scalable, proliferated-LEO architecture based on technological advancements in smaller sensor design and leveraging commercial-based capabilities. The Phase II modernized pathfinder efforts will include OTA contracts for technology risk reduction and operational demonstration efforts. The purpose of Phase II is to explore various technology projects and partnerships to determine the most technically acceptable, resilient, and affordable option to support Phase III. Informed by Phase II, the Phase III operational system replacement acquisition strategy will be decided in FY26 and will consider modern architectures such as proliferated-LEO, hosted-payload, or other commercial capabilities.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1203710SF / EO/IR Weather Systems	Project (Number/Name) 643730 / EO/IR Weather System Dev
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Phase II Demo 1	C/Various	Various : Various	-	77.272	Dec 2022	50.891	Dec 2023	19.444	Dec 2024	-		19.444	Continuing	Continuing	-
Phase II Demo 2	C/Various	TBD : TBD	-	-		29.106	Jul 2024	42.533	Feb 2025	-		42.533	Continuing	Continuing	-
Technical Mission Analysis	RO	Aerospace Corp : El Segundo, CA	-	0.896	Jan 2023	2.178	Jan 2024	1.844	Jan 2025	-		1.844	Continuing	Continuing	-
Enterprise Systems Engineering & Integration	C/CPIF	Engility Corp : Andover, WA	-	2.527	Jan 2023	2.625	Jan 2024	2.746	Jan 2025	-		2.746	Continuing	Continuing	-
SBIR/STTR	C/Various	TBD : TBD	-	2.924	Mar 2024	3.347	Mar 2024	2.707	Mar 2025	-		2.707	Continuing	Continuing	-
Subtotal			-	83.619		88.147		69.274		-		69.274	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
FFRDC	RO	Aerospace Corp : El Segundo, CA	-	3.489	Jan 2023	3.267	Jan 2024	2.767	Jan 2025	-		2.767	Continuing	Continuing	-
A&AS	Various	Various : Various	-	0.000	Jan 2023	4.111	Jan 2024	3.374	Jan 2025	-		3.374	Continuing	Continuing	-
Other Support	Various	Various : Various	-	0.087	Oct 2022	0.090	Oct 2023	0.976	Oct 2024	-		0.976	Continuing	Continuing	-
Subtotal			-	3.576		7.468		7.117		-		7.117	Continuing	Continuing	N/A

			Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	87.195	95.615	76.391	-	76.391	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1203710SF / EO/IR Weather Systems	Project (Number/Name) 643730 / EO/IR Weather System Dev
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	FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

EO/IR Weather Systems (EWS)	
Phase II Modernized Pathfinder - Technology Risk Reductions	
Phase II Modernized Pathfinder - Operational Demonstrations	
Phase II Technology Demonstration Launch (Orion Space Solutions)	
Phase II 2nd Technology Demonstration Launch (Orion Space Solutions)	
Phase II Inc 0 Operational Demonstration #1 No Later Than Launch (General Atomics)	
Phase II Inc 0 Operational Demonstration #2 No Later Than Launch (TBD)	
Phase III Operational Replacement	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1203710SF / <i>EO/IR Weather Systems</i>	Project (Number/Name) 643730 / <i>EO/IR Weather System Dev</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>EO/IR Weather Systems (EWS)</i>				
Phase II Modernized Pathfinder - Technology Risk Reductions	1	2023	1	2025
Phase II Modernized Pathfinder - Operational Demonstrations	1	2023	4	2029
Phase II Technology Demonstration Launch (Orion Space Solutions)	1	2023	1	2023
Phase II 2nd Technology Demonstration Launch (Orion Space Solutions)	1	2024	1	2024
Phase II Inc 0 Operational Demonstration #1 No Later Than Launch (General Atomics)	4	2025	4	2025
Phase II Inc 0 Operational Demonstration #2 No Later Than Launch (TBD)	2	2028	2	2028
Phase III Operational Replacement	1	2027	4	2029

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 1203955SF / Space Access, Mobility & Logistics (SAML)
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	20.000	0.000	20.000	0.000	0.000	0.000	0.000	0.000	20.000
640016: Space Access, Mobility & Logistics (SAML) Eff	-	0.000	0.000	16.000	0.000	16.000	0.000	0.000	0.000	0.000	0.000	16.000
646601: Rocket Cargo	-	0.000	0.000	4.000	0.000	4.000	0.000	0.000	0.000	0.000	0.000	4.000

Note
 This program, BA 4, PE 1203955SF, project , Point to Point Delivery (P2PD), is a new start.

Program 1203955SF's name has been changed from Space Access, Mobility, and Logistics to "Servicing, Mobility, and Logistics" to clearly delineate this program and mission from previously established Space Access / Launch program elements within the Assured Access to Space (AATS) portfolio e.g. National Security Space Launch (Space) - EMD which enable RDT&E in support of spacelift activities within the AATS portfolio.
 BPAC 646601's name has been changed to Point to Point Delivery (P2PD). Prior years' funding for P2PD's air drop mission development was executed by AFRL adjacent to the Rocket Cargo Vanguard program within PE 0603032F / Future AF Integrated Technology Demos (e.g., 26.6 in FY2022, 28.9 in FY2023).
 BPAC 640016's name has been changed to On-Orbit Servicing, Mobility, and Logistics (OOSML). Prior years' funding for On-Orbit Servicing, Mobility & Logistics was executed within PE 1206853SF (i.e., 16.9M in FY2022 and 30M in FY2023).

A. Mission Description and Budget Item Justification

The Servicing, Mobility, and Logistics (SML) program identifies and closes space related mobility and logistics capability gaps to facilitate integration and employment of on-orbit servicing and mobility for prepared and unprepared spacecraft and logistics in, from, and through space. The Servicing, Mobility, and Logistics mission areas include but are not limited to on-orbit refueling/repair/upgrade/assembly/manufacturing; orbit repositioning; sustained maneuver; autonomous Rendezvous, Proximity Operations & Docking (RPOD); beyond geostationary orbit (XGEO) operations; and sub-orbital and orbital point-to-point delivery operations.

The near-term focus of the SML program (2025 through 2026) is to establish the foundational capability areas through RDT&E, technology demonstrations, operational integration, and fielding of Point to Point Delivery (P2PD) services and on-orbit mobility services, to include refueling. The P2PD project will advance and integrate technology developed within the Rocket Cargo Vanguard program to demonstrate an airdrop delivery capability. The On-Orbit Servicing, Mobility, & Logistics (OOSML) project will integrate commercially available servicing technology into operational capabilities including prototyping of modified commercial off the shelf (COTS) systems and services.

The SML program provides a cost-effective vehicle to cultivate commercial space systems that have achieved high Technology Readiness Level (TRL) that can be leveraged to meet the needs of DoD components. Activities include system engineering technology maturation, tactics development required for operational integration, prototyping and test and evaluation required for technology transition to effective operational employment.

The SML program will mature, integrate, and transition space system demonstrations and prototypes in order to:
 - Rapidly address identified capability gaps with emergent technologies

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1203955SF / <i>Space Access, Mobility & Logistics (SAML)</i>
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- Focus the integration of Science & Technology (S&T) innovations into operational capabilities and transition those capabilities to service acquisitions or space programs of record
- Accelerate technical maturation of emerging technologies to close high-priority capability gaps to secure US overmatch against pacing threats
- Provide targeted investment in the space industrial base to support U.S. national security in a great power competition

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Servicing, Mobility, and Logistics capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 1206392SF and 1206398SF.

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)	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025 Base</u>	<u>FY 2025 OCO</u>	<u>FY 2025 Total</u>
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	20.000	0.000	20.000
Total Adjustments	0.000	0.000	20.000	0.000	20.000
• 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	0.000	0.000			
• Other Adjustments	0.000	0.000	20.000	0.000	20.000

Change Summary Explanation

Program element was established in FY25 to resource development and integration activities regarding space Servicing, Mobility, and Logistics systems including but not limited to refueling systems risk-reduction, Rocket Cargo Advance Mission development, and other technically mature on-orbit SML platforms and their integration into the burgeoning on-orbit SML family of systems.

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 4					R-1 Program Element (Number/Name) PE 1203955SF / <i>Space Access, Mobility & Logistics (SAML)</i>				Project (Number/Name) 640016 / <i>Space Access, Mobility & Logistics (SAML) Eff</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
640016: <i>Space Access, Mobility & Logistics (SAML) Eff</i>	-	0.000	0.000	16.000	0.000	16.000	0.000	0.000	0.000	0.000	0.000	16.000
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

BPAC 640016's name has been changed to On-Orbit Servicing, Mobility, and Logistics (OOSML). Prior years' funding for On-Orbit Servicing, Mobility & Logistics (OOSML) was executed within PE 1206853SF (e.g., ~16.9M in FY2022 and \$30M in FY2023)

A. Mission Description and Budget Item Justification

On-Orbit Servicing, Mobility, and Logistics (OOSML) advances neglected support capabilities in the space domain, ensuring asset availability to the warfighter. The initial thrust for OOSML is a service architecture ensuring prepared systems can replenish energy, as needed, to maintain operator proficiency and sustained readiness in a contested domain with flexibility to meet the increased challenges of conflict. This capability provides USSPACECOM the requisite supply chain to de-constrain operations currently limited by a fixed fuel budget, enabling movement and maneuver Dynamic Space Operations for critical National Security Space assets. Advancing an on-orbit refueling architecture enables a prepared architecture for subsequent OOSML lines of effort including mobility, relocation, repair and disposal. Additionally, as refueling requires the application of Rendezvous, Proximity Operations and Docking (RPOD) technology, the techniques, tactics and procedures (TTPs) attained through refueling simplify and accelerate subsequent capabilities. In tandem with efforts to qualify and onboard refueling onto a "services contract" for ongoing propellant replenishment missions, OOSML will maintain connectivity to the burgeoning commercial market to capitalize on industry advancement to qualify and onboard additional on-orbit capabilities as they mature. As an "anchor tenant" this may include providing last-mile development funding for government purpose modifications, demonstrations, landscape assessments and architecture development. Due to client variations in mission, orbit, configuration and security OOSML services will not be a "one size fits all" approach and will require an enduring programmatic and systems engineering investment to meet customer requirements.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: On-Orbit Servicing, Mobility & Logistics (OOSML)	-	0.000	16.000
Description: On-Orbit Servicing, Mobility & Logistics (OOSML) The capability to refuel assets on-orbit is critical to perform sustained maneuver for dynamic space operations (DSO). The first step to providing this service at scale is to demonstrate the capability in an on-orbit test event. This includes proving the viability of autonomous Rendezvous and Proximity Operations (RPO), ability of commercial vendors to provide refueling as a service and prove security of dynamic operations. As refueling capacity is proven, the next step is to quantify the amount, type, and timing of fuel required to be accessible by on-orbit assets. This necessitates an iterative SML architecture and commercial landscape assessment. Further, development of a process to onboard and qualify providers for on-orbit services requires establishment of program office cadre.			
FY 2024 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1203955SF / <i>Space Access, Mobility & Logistics (SAML)</i>	Project (Number/Name) 640016 / <i>Space Access, Mobility & Logistics (SAML) Eff</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
N/A			
<p><i>FY 2025 Plans:</i> Investments leverage demonstration and operationalization of near-term commercial services, which enhance the National Security Space mission area. Funding exploits commercial On-Orbit Servicing, Logistics and Mobility systems already operational by qualifying providers for operations with National Security Space assets, including any required programmatic support. Additionally, funding provides for ongoing assessment(s) of the commercial landscape as it relates to OOSML capabilities and the optimal application of those capabilities in achieving National Security Objectives. Examples of OOSML capabilities include, but are not limited to, on-orbit refueling, mobility, relocation, repair, resupply and development of enabling technologies. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p><i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> N/A (New PE/BPAC)</p>			
Accomplishments/Planned Programs Subtotals	-	0.000	16.000

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force												Date: March 2024			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
3620F / 4				PE 1203955SF / Space Access, Mobility & Logistics (SAML)				640016 / Space Access, Mobility & Logistics (SAML) Eff							
Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
On Orbit Servicing	Various	Not specified. : TBD	-	-		-		14.752	Feb 2025	-		14.752	Continuing	Continuing	-
SBIR/STTR	Various	Not specified. : TBD	-	-		-		0.720	Mar 2025	-		0.720	Continuing	Continuing	-
Subtotal			-	-		-		15.472		-		15.472	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Advisory & Assistance Services (A&AS)	Various	Not specified. : TBD	-	-		-		0.208		-		0.208	Continuing	Continuing	-
Other Support	Various	Not specified. : TBD	-	-		-		0.320		-		0.320	Continuing	Continuing	-
Subtotal			-	-		-		0.528		-		0.528	Continuing	Continuing	N/A
Project Cost Totals			Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract				
Project Cost Totals			-	-	-	16.000	-	16.000	Continuing	Continuing	N/A				
Remarks															

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1203955SF / <i>Space Access, Mobility & Logistics (SAML)</i>	Project (Number/Name) 640016 / <i>Space Access, Mobility & Logistics (SAML) Eff</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>On Orbit Servicing (OOSML)</i>				
OOSML Contract Award	2	2025	4	2025

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1203955SF / <i>Space Access, Mobility & Logistics (SAML)</i>	Project (Number/Name) 646601 / <i>Rocket Cargo</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
646601: <i>Rocket Cargo</i>	-	0.000	0.000	4.000	0.000	4.000	0.000	0.000	0.000	0.000	0.000	4.000
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
This program, BA 4, PE 1203955SF, project , Point to Point Delivery (P2PD), is a new start.

BPAC 646601's name has been changed to Point to Point Delivery (P2PD). Prior years' funding for P2PD's air drop mission development (study only) was executed by AFRL adjacent to the Rocket Cargo Vanguard program within PE 0603032F / Future AF Integrated Technology Demos (e.g., 26.6 in FY2022, 28.9 in FY2023)

A. Mission Description and Budget Item Justification

Point-to-Point Delivery (P2PD) project builds upon prior S&T work within AFRL's Rocket Cargo Vanguard program, to develop and integrate P2PD prototype systems to meet unique military use cases. The project seeks to influence and integrate relevant component technologies and systems from S&T to high-TRL prototypes that demonstrate military-unique applications and early operational capability. The project will also study and deliver initial concepts of operation and tactics development recommendations for future operational applications. This project matures game-changing technology to close space mobility and logistics capability gaps and promotes a strong resilient national space industrial base.

The near-term focus of the P2PD program is to establish the foundational capability areas through operational integration and fielding of Point-to-Point Delivery (P2PD) services, specifically the development and integration of prototype air drop delivery systems. The P2PD project will integrate technology developed within the Rocket Cargo Vanguard program, as well as identify, evaluate, and certify additional Point to Point Delivery service providers.

The SML program provides a cost-effective investment method to cultivate relevant commercial space systems that have achieved high Technical Readiness Level (TRL) and can be leveraged to meet the needs of DoD components. Activities include system engineering technology maturation, tactics development required for operational integration, prototyping and test and evaluation required for technology transition to enable effective operational employment.

The SML program will mature, integrate, and transition space system demonstrations and prototypes in order to:

- Rapidly address identified capability gaps with emergent technologies
- Focus and integrate Science & Technology (S&T) innovations into operational capabilities and transition those capabilities to space acquisition programs of record
- Accelerate technical maturation of emerging technologies to close high-priority capability gaps to secure US overmatch against pacing threats
- Provide targeted investment in the space industrial base to support U.S. national security in a great power competition

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Point to Point Delivery (P2PD)	-	0.000	4.000
Description: Funds invest in Point-to-Point Delivery (P2PD) services. is focused on utilizing vehicles that traverse from or through space to transport DoD materiel anywhere around the world within tactically responsive timelines. The near-term focus of the program is to establish the foundational capabilities through the transition of AFRL's Rocket Cargo Vanguard technology into			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1203955SF / <i>Space Access, Mobility & Logistics (SAML)</i>	Project (Number/Name) 646601 / <i>Rocket Cargo</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>operations. The long-term focus includes, but is not limited to, supporting the USTRANSCOM resupply mission, with potential applications including the delivery of equipment needed to sustain stand-in mission operations and enable timely disaster relief payloads in support of consequence management CONPLAN execution.</p> <p>FY 2024 Plans: N/A</p> <p>FY 2025 Plans: FY2025 funding will support the detailed engineering design necessary for a P2PD service provider to perform airdrop payload delivery. This work will build on AFRL's previous analysis of the angle-of-attack, door locations, ejection speeds, container sizes, reaction forces and expected actuation authority required to counter those forces, and the aerodynamics of the ejected payload in flight. AFRL has also completed the first phase of wind tunnel testing, analysis, and operational planning. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: N/A (New PE/BPAC)</p>			
Accomplishments/Planned Programs Subtotals	-	0.000	4.000

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force			Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1203955SF / <i>Space Access, Mobility & Logistics (SAML)</i>	Project (Number/Name) 646601 / <i>Rocket Cargo</i>	

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>Point to Point Delivery (P2PD)</i>	
P2PD Contract Award	██████████

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1203955SF / <i>Space Access, Mobility & Logistics (SAML)</i>	Project (Number/Name) 646601 / <i>Rocket Cargo</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Point to Point Delivery (P2PD)</i>				
P2PD Contract Award	2	2025	4	2025

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206410SF / <i>Space Technology Development and Prototyping</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	979.364	2,081.307	1,701.685	0.000	1,701.685	1,799.720	1,824.708	1,900.937	1,938.374	Continuing	Continuing
643729: <i>Integration and Battle Management</i>	-	89.730	126.661	153.732	0.000	153.732	44.245	37.329	38.670	39.434	Continuing	Continuing
643731: <i>Transport</i>	-	811.242	1,847.944	1,439.241	0.000	1,439.241	1,695.357	1,783.370	1,859.261	1,895.934	Continuing	Continuing
643732: <i>Sensing</i>	-	78.392	106.702	108.712	0.000	108.712	60.118	4.009	3.006	3.006	Continuing	Continuing

A. Mission Description and Budget Item Justification

SDA is responsible for developing and demonstrating the next generation proliferated warfighter space architecture to enable U.S. military operations to be responsive to emerging multi-domain threats against our national security. To achieve that goal, SDA will help inform the Department of Defense (DoD)'s decision to develop and implement a proliferated architecture enabled by lower-cost, mass-produced space vehicles and routine space access; and shift the DoD to a development organization focused on experimentation, prototyping, and accelerated fielding. SDA will manage, direct, and execute the development of the space capabilities for the joint warfighter in accordance with DoD's Space Vision and field space capabilities at speed and scale, with the following goals:

- Bold breakthroughs designed to out-pace our competitors,
- Mission-focused technology maturation and systems engineering,
- Value-based lean engineering, manufacturing, and support,
- Warfighter-centric capability development enabling joint all-domain operations,
- Industrial base expansion; streamlined development and acquisition processes, and
- Increased acquisition cooperation across the space enterprise.

SDA will rapidly deploy critical elements of next-generation space capabilities, initially focusing on these essential capabilities:

- Indications, warnings, targeting, and tracking for defense against hypersonic and advanced missile threats,
- Alternate position, navigation, and timing (APNT) for a navigation warfare (NAVWAR) resilient environment,
- Responsive, resilient, common ground-based space support infrastructure (e.g., optical and RF ground stations and commercially-oriented satellite operations centers),
- Cross-domain, networked, node-independent battle management command, control, and communications (BMC3), and
- Highly-scaled, low-latency, persistent, resilient proliferated Low Earth Orbit (LEO) space data transport.

The establishment of a proliferated data Transport Layer in LEO is essential to developing a new, responsive space architecture, and will be SDA's primary initial focus within the Proliferated Warfighter Space Architecture (PWSA). SDA will develop an initial set of adjunct and sub-constellations in conjunction with this Transport Layer to provide additional capabilities, such as advanced missile warning and tactical satellite communications.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206410SF / <i>Space Technology Development and Prototyping</i>
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This program element funds efforts to develop and demonstrate a prototype proliferated Low Earth Orbit (pLEO) communications and data Transport Layer and its sub-constellations in support of the DoD Space Vision.

This program element may include necessary civilian pay expenses and contractor support required to facilitate delivery of the Transport capability.

The total cost of the Tranche 1 (T1) Transport Layer Middle Tier of Acquisition effort is \$2,977.300 million, including RDT&E and procurement of prototype units. The T1 Transport Layer RP program is fully funded across the Future Years Defense Program.

The total cost of the Tranche 2 (T2) Transport Layer Middle Tier of Acquisition effort is \$5,250.700 million, including RDT&E and procurement of prototype units. The T2 Transport Layer RP program is fully funded across the Future Years Defense 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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	1,015.822	2,081.307	1,626.682	0.000	1,626.682
Current President's Budget	979.364	2,081.307	1,701.685	0.000	1,701.685
Total Adjustments	-36.458	0.000	75.003	0.000	75.003
• 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	-36.458	0.000			
• Other Adjustments	0.000	0.000	75.003	0.000	75.003

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 643731: *Transport*

Congressional Add: *Laser Communication Downlink Systems*

Congressional Add: *Space Architecture Experimental Testbed*

Congressional Add Subtotals for Project: 643731

Congressional Add Totals for all Projects

	FY 2023	FY 2024
	24.085	-
	3.853	-
Congressional Add Subtotals for Project: 643731	27.938	-
Congressional Add Totals for all Projects	27.938	-

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force Date: March 2024

Appropriation/Budget Activity
3620F: Research, Development, Test & Evaluation, Space Force / BA 4:
Advanced Component Development & Prototypes (ACD&P)

R-1 Program Element (Number/Name)
PE 1206410SF / Space Technology Development and Prototyping

Change Summary Explanation

FY 2023 decreases between the Previous President's Budget and Current President's Budget by \$36.458 million due to reallocations for SBIR/STTR projects.

FY 2025 increases between the Previous President's Budget and Current President's Budget due to the addition of a classified project, adjustments for inflation, and adjustments for other United States Space Force priorities.

FY 2025 decreases from FY 2024 due to Tranche 1 completing satellite development and production.

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 4					R-1 Program Element (Number/Name) PE 1206410SF / <i>Space Technology Development and Prototyping</i>				Project (Number/Name) 643729 / <i>Integration and Battle Management</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
643729: <i>Integration and Battle Management</i>	-	89.730	126.661	153.732	0.000	153.732	44.245	37.329	38.670	39.434	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

SDA is developing and demonstrating next generation space capabilities for the joint warfighter enabled by proliferation of satellites in Low Earth Orbit (LEO) and a new acquisition model utilizing rapid spiral development. SDA is developing capabilities to address a wide range of Department of Defense (DoD) space needs as stated in the National Defense Strategy and DoD Space Vision, including space-based battle management and a ground support infrastructure. SDA will orchestrate the rapid development and fielding of the Proliferated Warfighter Space Architecture (PWSA), a resilient military sensing and data transport capability via a proliferated space architecture in LEO. This program element funds the development and demonstration of space technologies to deliver space-based command and control, tasking, mission processing and dissemination capabilities, as well as an integrated, resilient network of ground support capabilities, to U.S. joint warfighting forces in bi-annual tranches, which began in FY 2022.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Integration and Battle Management	89.730	126.661	153.732
Description: Deliver capabilities to U.S. joint warfighting forces in two-year enhanced capability tranches, beginning in FY 2022. Products include but are not limited to performing trade studies, technical analyses, or modeling and simulation; identifying and maturing enabling technologies; defining and conducting ground-based and on-orbit risk reduction demonstrations, prototyping hardware or software systems; and exploring novel concepts for future warfighting capabilities augmented by a resilient proliferated Low Earth Orbit (pLEO) satellite architecture.			
FY 2024 Plans:			
Tranche 0			
- Continue on-orbit command and control operations from ground operations center.			
- Continue to coordinate post-Capstone demonstrations and experimentation with warfighters and partner organizations.			
- Demonstrate on-orbit data fusion to inform command and control operations.			
Tranche 1			
- Define Concept of Operations (CONOPS) and complete pre-launch validation and verification for Tranche 1 Ground based mission segment and define the Government Owned, Contractor Operated (GOCO) architecture.			
- Finalize Operations Center modifications at Redstone Arsenal and Grand Forks for Tranche 1 satellite operations.			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206410SF / <i>Space Technology Development and Prototyping</i>	Project (Number/Name) 643729 / <i>Integration and Battle Management</i>

B. Accomplishments/Planned Programs (\$ in Millions)

- Develop ground mission management, network management, enterprise system management capabilities to support PWSA operations.
- Complete integrated ground software testing with space vehicle command, control, and telemetry software.
- Integrate space vehicle command and control workstations into both operations centers.
- Finalize Ground Segment Ground Entry Point (GEP) Strategy, including locations and quantity of terminals, Operations Center Vision, and Basing Actions and preparation for integrated ground readiness tests.
- Complete site modifications in preparation for GEP terminal installation and Defense Information Systems Agency (DISA) network connectivity.
- Complete development, integration, and test of ground antennas and communications equipment and begin production and delivery of the hardware.
- Conduct installation of ground terminal and network equipment for baseline continental U.S. (CONUS) GEP sites and begin preparations at OCONUS sites.
- Coordinate software-in-the-loop (SIL) and hardware-in-the-loop (HIL) activities to ensure compatibility and interoperability of Space Vehicle Vendor Factories and FlatSats with Operations and Integration (O&I) to support prelaunch testing and post launch anomaly resolution.
- Establish a development, security, and operations (DevSecOps) pipeline to support integrated Operations, Maintenance, and Sustainment from the ground operations centers.
- Configure and install workstations, server racks, IT support equipment, and administrative facilities into the Operations Centers
- Develop test and training documentation for GOCO mission operations.
- Conduct an integrated Ground Readiness Review for all PWSA baseline system segments to ensure readiness for launch and operations.
- Continue development of the Application Factory that will serve as the foundation of the Battle Management Command, Control, and Communications (BMC3) Layer. Supported by bi-monthly Incremental Design Reviews to enable common data processing and fusion across all Transport Layer satellites.
- Establish design standards to ensure forward compatibility and begin designing Applications for the BMC3 Layer Application Factory to process data on-board the space vehicle.
- Begin designing additional BMC3 Layer Applications for supporting additional services and users.

Tranche 2

- Begin the Proliferated Warfighter Space Architecture (PWSA) Ground Segment (GS) systems engineering integration, development, operations, maintenance, and sustainment.
- Continue development of the Test and Checkout Center (TCC) as a standalone Operations Center with terrestrial connectivity, additional GEPs, and all other necessary infrastructure to support the full range of Tranche 2 (T2) launch, initialization, and operational test activities.

FY 2023	FY 2024	FY 2025

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206410SF / <i>Space Technology Development and Prototyping</i>	Project (Number/Name) 643729 / <i>Integration and Battle Management</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<ul style="list-style-type: none"> - Begin transition from hybrid ground architecture to fully cloud-enabled capability to enable support and integration of future tranches. - Explore ground communication terminal efficiencies. - Explore expansion of BMC3 Application Factory to support T2 mission applications. - Complete design of interoperability testbeds to support T2 capabilities. <p>Proliferated Warfighter Space Architecture (PWSA) Future Programs (PFP)</p> <ul style="list-style-type: none"> - Construct ground segment network including a Demonstration Operations Center (DOC). - Initiate PFP Ground Segment Integration (PGI) effort to provide a common, enduring ground infrastructure and resources to minimize cost and complexity for PFP space vehicle demonstration and experimentation programs (beginning with FOO Fighter and T2DES). <p>FY 2025 Plans:</p> <p>Tranche 0</p> <ul style="list-style-type: none"> - Continue on-orbit command and control operations from ground operations center. - Continue to coordinate post-Capstone demonstrations and experimentation with warfighters and partner organizations. <p>Tranche 1</p> <ul style="list-style-type: none"> - Complete development and begin automation of ground mission management, network management, enterprise system management capabilities to support Proliferated Warfighter Space Architecture (PWSA) operations. - Complete integration of space vehicle command and control workstations into both operations centers. - Complete site modifications in preparation for Ground Entry Point (GEP) terminal installation and DISA network connectivity for full architecture of ground sites including optical GEPs. - Complete test and delivery of ground antennas and communications equipment. - Complete installation of ground terminal and network equipment for continental U.S. (CONUS) GEP sites and conduct installation at outside the continental U.S. (OCONUS) sites. - Maintain Operation Centers to support Tranche 1 activities. - Maintain DevSecOps pipeline to support integrated Operations, Maintenance, and Sustainment from the ground operations centers. - Train operators for PWSA Government Owned, Contractor Operated (GOCO) mission operations. - Conduct PWSA system level developmental testing and begin operational test planning and activities. - Establish system connectivity to PWSA users and tasking authorities to support test and early adopter operations. - Establish and maintain the Application Factory that will serve as the foundation of the Battle Management Command, Control, and Communications (BMC3) Layer. 			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206410SF / <i>Space Technology Development and Prototyping</i>	Project (Number/Name) 643729 / <i>Integration and Battle Management</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<ul style="list-style-type: none"> - Operate and maintain the BMC3 Ecosystem including the ground and space components. - Continue design and development of BMC3 Applications to provide mission services, system automation, and data fusion capabilities in support of warfighter priorities. <p>Tranche 2</p> <ul style="list-style-type: none"> - Build out foundational modeling, simulation, and digital engineering tools to enable dynamic modeling for future architecture growth of the PWSA. - Continue to explore and implement ground communication terminal efficiencies. - Continue development of the PWSA Ground Segment. - Identify and implement extensions and/or additional capabilities required in SDA Operations Centers for ground command and control of Tranche 2 assets. - Continue development of the TCC and support early PWSA Ground Segment (GS) integration activities to ensure readiness for Tranche 2 (T2) launches. - Begin development of BMC3 Application Factory expansion. - Complete development of interoperability testbed to support T2 capabilities. <p>Tranche 3</p> <ul style="list-style-type: none"> - Identify extensions and/or additional capabilities required in SDA Operations Centers for ground command and control of Tranche 3 assets. <p>PFP</p> <ul style="list-style-type: none"> - Complete facility and network design for the DOC to support demonstrations. - Continue PFP Ground Segment Integration (PGI) effort to provide a common, enduring ground infrastructure and resources to minimize cost and complexity for PFP space vehicle demonstration and experimentation programs (beginning with FOO Fighter and T2DES). <p>FY 2024 to FY 2025 Increase/Decrease Statement: The increase between the FY 2024 amount and the FY 2025 amount supports continued build out of ground capabilities for Tranche 2 and initial capabilities for Tranche 3.</p>				
Accomplishments/Planned Programs Subtotals		89.730	126.661	153.732
C. Other Program Funding Summary (\$ in Millions)				
N/A				

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206410SF / <i>Space Technology Development and Prototyping</i>	Project (Number/Name) 643729 / <i>Integration and Battle Management</i>

C. Other Program Funding Summary (\$ in Millions)

Remarks

D. Acquisition Strategy

Partners for these activities may include Missile Defense Agency (MDA), Space Systems Command (SSC), Space Operations Command (SpOC), Space Training and Readiness Command (STARCOM), Space Rapid Capabilities Office (SpRCO), DoD Combatant Commands, DoD research centers, small businesses, large defense contractors, commercial space providers, non-traditional aerospace and defense contractors, Federally Funded Research and Development Centers, and University Affiliated Research Centers.

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206410SF / <i>Space Technology Development and Prototyping</i>	Project (Number/Name) 643729 / <i>Integration and Battle Management</i>

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>Integration and Battle Management</i>	
Complete the development of an initial battle management architecture.	
Complete the development of Tranche 0 ground support infrastructure.	
Manage Tranche 0 constellation operations.	
Conduct Tranche 1 integration activities.	
Conduct Tranche 2 integration activities.	
Conduct Tranche 3 integration activities	
<i>Test and Checkout Center</i>	
Continue development of the Test and Checkout Center (TCC) within the Government Owned, Contractor Operated (GOCO) model.	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206410SF / <i>Space Technology Development and Prototyping</i>	Project (Number/Name) 643729 / <i>Integration and Battle Management</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Integration and Battle Management</i>				
Complete the development of an initial battle management architecture.	1	2023	4	2024
Complete the development of Tranche 0 ground support infrastructure.	1	2023	4	2024
Manage Tranche 0 constellation operations.	1	2023	4	2026
Conduct Tranche 1 integration activities.	1	2023	4	2026
Conduct Tranche 2 integration activities.	3	2023	4	2026
Conduct Tranche 3 integration activities	3	2025	4	2026
<i>Test and Checkout Center</i>				
Continue development of the Test and Checkout Center (TCC) within the Government Owned, Contractor Operated (GOCO) model.	2	2023	4	2026

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206410SF / <i>Space Technology Development and Prototyping</i>	Project (Number/Name) 643731 / <i>Transport</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
643731: <i>Transport</i>	-	811.242	1,847.944	1,439.241	0.000	1,439.241	1,695.357	1,783.370	1,859.261	1,895.934	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

SDA is developing and demonstrating next generation space capabilities for the joint warfighter enabled by proliferation of satellites in Low Earth Orbit (LEO) and a new acquisition model utilizing rapid spiral development. SDA is developing capabilities to address a wide range of Department of Defense (DoD) space needs as stated in the National Defense Strategy and DoD Space Vision, including low-latency tactical communication enabling beyond line of sight targeting and advanced missile tracking. SDA is orchestrating the rapid development and fielding of the Proliferated Warfighter Space Architecture (PWSA), a resilient military sensing and data transport capability via a proliferated space architecture in LEO. This program element funds the development and demonstration of space technologies to deliver low-latency data transport and alternate position, navigation, and timing capabilities to U.S. joint warfighting forces in bi-annual tranches, which began in FY 2022.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
<p>Title: Transport</p> <p>Description: Rapidly develop, deploy and demonstrate prototypes that enable a resilient and unified military data transport layer, sensor capabilities, and alternate position, navigation, and timing (APNT) capabilities enabled by a proliferated Low Earth Orbit (pLEO) architecture. This effort will define, demonstrate, and deliver the architectures and standards necessary to rapidly prototype and field new satellite capabilities in LEO.</p> <p>FY 2024 Plans:</p> <p>Tranche 0</p> <ul style="list-style-type: none"> - Continue to leverage Tranche 0 (T0) satellites as a testbed for investigating additional capabilities after Capstone demonstrations. <p>Tranche 1</p> <ul style="list-style-type: none"> - Complete interoperability and compatibility testing for Tranche 1 Transport Layer (T1TL) space vehicles space-to-ground radio frequency (RF) links, Link-16, Optical communications terminals, and network and encryption capabilities. - Execute Test Readiness Reviews for each Transport space vehicle vendor. - Perform integration testing of space vehicle command and control software with ground operations software. - Complete development of space vehicle command, control and telemetry hardware and software systems, test with O&I ground system, and integrate workstations into the PWSA Operation Centers. - Complete space vehicle FlatSat development and begin operations testing through connections with O&I the ground segment. - Determine readiness of hardware and software procedures to support the start of testing. 	763.841	1,809.964	1,428.111

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206410SF / <i>Space Technology Development and Prototyping</i>	Project (Number/Name) 643731 / <i>Transport</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<ul style="list-style-type: none"> - Complete Transport SV component deliveries and vehicle assembly and integration. - Conduct Assembly, Integration & Testing (AI&T) of Transport space vehicles in preparation for Transport space vehicle launches. - Conduct production, build, and test phase for T1TL space vehicle. - Determine readiness to ship flight hardware, software, and support equipment to launch site and launch site readiness to receive and begin shipping space vehicles to launch site. - Evaluate the space flight worthiness of the space vehicle and launch vehicle flight hardware prior to integration, encapsulation, and upper stage mate and start launch vehicle integration activities. - Ensure readiness to conduct launch and early orbit phase operations and transition to nominal operations - Begin launching the T1TL space vehicles. - Continue hardware development and risk reduction for Battle Management Command, Control, and Communications (BMC3) modules for Transport Layer satellites. <p>Tranche 2</p> <ul style="list-style-type: none"> - Continue designing the Tranche 2 Transport Layer (T2TL) space vehicles based on requirements and lesson learned from T0 and T1 space vehicles, ground system, and interoperability requirements. - Continue establishing constellation design requirements for incorporating additional tactical data links into the Transport Layer, likely via the incorporation of Transport Layer vehicles hosting alternate data links. - Conduct the System Requirements Review for the T2TL Alpha and T2TL Beta space vehicles. - Complete Preliminary Design Review for the T2TL Alpha and T2TL Beta space vehicles and order long-lead items. - Complete award and kick-off for third T2TL Beta space vehicle vendor. - Award contracts to T2 Gamma space vehicle vendor(s) to support specific parts of the Transport mission. <p>PWSA Future Programs (PFP)</p> <p>Tranche X Demonstration and Experimentation System (TxDES)</p> <ul style="list-style-type: none"> - Complete T1 Demonstration and Experimentation (T1DES) delta System Requirements Review (delta-SRR) - Complete T1DES Preliminary Design Review (PDR). - Complete T1DES Critical Design Review (CDR). - Continue design and analysis effort for an additional tactical data link, waveform, and/or APNT signal planned for demonstration in T2 (i.e., T2 Demonstration and Experimentation System (T2DES)) and proliferation beginning with PWSA Tranche 3 (T3). <p>FY 2025 Plans:</p> <p>Tranche 0</p> <ul style="list-style-type: none"> - Continue to leverage Tranche 0 satellites as a testbed for investigating additional capabilities after Capstone demonstrations. 				

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206410SF / <i>Space Technology Development and Prototyping</i>	Project (Number/Name) 643731 / <i>Transport</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Tranche 1</p> <ul style="list-style-type: none"> - Complete AI&T of Transport space vehicles and payloads in preparation for Transport space vehicle launches. - Complete production, build, and test phase for Transport space vehicle. - Continue and complete shipping space vehicles to launch site and integration onto the multi-vehicle launch dispensers. - Continue and complete launch vehicle integration activities. - Continue and complete readiness for launch and early orbit phase operations and transition to nominal operations. - Complete the remaining launches for the T1 Transport Layer space vehicles. - Conduct on-orbit test and checkout, orbital positioning, and transition operations to the operations centers for each plane of space vehicles. - Conduct system level Developmental Testing. - Begin Operational Testing. - Transition to nominal operations and provide continuing space vehicle and enterprise management and sustainment. <p>Tranche 2</p> <ul style="list-style-type: none"> - Complete System Requirements Review for the T2TL Gamma space vehicles. - Complete Preliminary Design Review for the T2TL Gamma space vehicles. - Complete Critical Design Review for the T2TL Alpha, Beta, and Gamma space vehicles. - Begin assembly, integration, and testing of T2TL Alpha, Beta, and Gamma space vehicles. - Support early integration studies for T2TL launches. <p>Tranche 3</p> <ul style="list-style-type: none"> - Leverage lessons learned and accomplishments from previous Tranches to inform space vehicle, ground, and interoperability design requirements for Tranche 3 (T3) and start development of the next set of capabilities. - Determine minimum viable capability for T3 Transport, tactical satellite communications and future tactical data link constellation components. - Receive concurrence from the warfighting community on performance requirements for T3. - Initiate T3 acquisition and source selection processes leading to space vehicle vendor procurement instruments. - Award initial T3 space vehicle contracts. <p>PFP</p> <p>Tranche x Demonstration and Experimentation System (TxDES):</p> <ul style="list-style-type: none"> - Complete assembly, integration and test of T1 Demonstration and Experimentation System (T1DES) space vehicles and finalize demonstration plans. 			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206410SF / <i>Space Technology Development and Prototyping</i>	Project (Number/Name) 643731 / <i>Transport</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>- Finalize development of additional tactical data link, waveform, and/or APNT signal planned for demonstration in T2 (i.e., T2DES) and proliferation beginning with PWSA T3.</p> <p>- Continue to integrate commercial and mission partners' satellite constellations into the PWSA as part of TxDES; Develop translator sats for integrating partner satellite constellations.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: The decrease between the FY 2024 amount and the FY 2025 amount reflects Tranche 1 completing satellite development and production.</p>				
<p>Title: Classified Program</p> <p>Description: Due to the classified nature of this project, specific details are available at a higher classification level.</p> <p>FY 2024 Plans: Due to the classified nature of this project, specific details are available at a higher classification level.</p> <p>FY 2025 Plans: Due to the classified nature of this project, specific details are available at a higher classification level.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Due to the classified nature of this project, specific details are available at a higher classification level.</p>		19.463	37.980	11.130
Accomplishments/Planned Programs Subtotals		783.304	1,847.944	1,439.241
		FY 2023	FY 2024	
<p>Congressional Add: Laser Communication Downlink Systems</p> <p>FY 2023 Accomplishments: SDA has used the appropriated funds to accelerate development of ground, maritime, and air optical communications terminals, advance the technical and manufacturing maturity of the optical communications vendor market, and provide capability at a low cost and shorter deployment timeline. Activities include awarded and pending contracts for demonstration systems (space, ground, sea, and airborne terminal hardware) that are ruggedized, hold the size, weight and power usable for mobile forces, and in compliance with standards set by SDA.</p>		24.085	-	
<p>Congressional Add: Space Architecture Experimental Testbed</p> <p>FY 2023 Accomplishments: Began Phase 1 of the Test and Checkout Center (TCC) to include design, demolition, and procurement of long lead items. The TCC is a standalone Space Networking Center with terrestrial connectivity, Ground Entry Points (GEP), and all other necessary infrastructure to support the full</p>		3.853	-	

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206410SF / <i>Space Technology Development and Prototyping</i>	Project (Number/Name) 643731 / <i>Transport</i>
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	FY 2023	FY 2024
range of Tranche 2 system operations. The TCC would be used for Space Vehicle initialization, functional checkout, orbit raising and phasing, interoperability validation, and all other on-orbit system readiness preparations, allowing for a deliberate and orderly crossover to the SDA Space Networking Centers at Grand Forks Air Force Base, ND and Redstone Arsenal, AL.		
Congressional Adds Subtotals	27.938	-

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

Partners for these activities may include Missile Defense Agency (MDA), Space Systems Command (SSC), Space Operations Command (SpOC), Space Training and Readiness Command (STARCOM), Space Rapid Capabilities Office (SpRCO), DoD Combatant Commands, DoD research centers, small businesses, large defense contractors, commercial space providers, non-traditional aerospace and defense contractors, Federally Funded Research and Development Centers, and University Affiliated Research Centers.

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206410SF / <i>Space Technology Development and Prototyping</i>	Project (Number/Name) 643731 / <i>Transport</i>
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FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Transport	
Launch and operations of Tranche 0 Transport satellites.	
Continue activities for Tranche 1 development and delivery.	
Conduct activities for Tranche 2 capability development.	
Conduct activities for Tranche 3 capability development.	
Laser Communication Downlink Systems	
Development, Integration, Testing, and Capability Demonstration	
Space Architecture Experimental Testbed	
Explore the Test and Checkout Center (TCC) design and implementation options within the Government Owned, Contractor Operated (GOCO) model	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206410SF / <i>Space Technology Development and Prototyping</i>	Project (Number/Name) 643731 / <i>Transport</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Transport</i>				
Launch and operations of Tranche 0 Transport satellites.	1	2023	4	2026
Continue activities for Tranche 1 development and delivery.	1	2023	4	2026
Conduct activities for Tranche 2 capability development.	1	2023	4	2026
Conduct activities for Tranche 3 capability development.	1	2025	4	2026
<i>Laser Communication Downlink Systems</i>				
Development, Integration, Testing, and Capability Demonstration	2	2023	4	2026
<i>Space Architecture Experimental Testbed</i>				
Explore the Test and Checkout Center (TCC) design and implementation options within the Government Owned, Contractor Operated (GOCO) model	3	2023	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206410SF / <i>Space Technology Development and Prototyping</i>	Project (Number/Name) 643732 / <i>Sensing</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
643732: <i>Sensing</i>	-	78.392	106.702	108.712	0.000	108.712	60.118	4.009	3.006	3.006	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
Funds for the Tranche 1 Tracking Layer continue in RDT&E, Space Force, PE 1206446SF.

A. Mission Description and Budget Item Justification

SDA is developing and demonstrating next generation space capabilities for the joint warfighter enabled by proliferation of satellites in Low Earth Orbit (LEO) and a new acquisition model utilizing rapid spiral development. SDA is developing capabilities to address a wide range of Department of Defense (DoD) space needs as stated in the National Defense Strategy and DoD Space Vision, including advanced missile tracking and global surveillance enabling beyond-line-of-sight targeting. SDA will orchestrate the rapid development and fielding of the Proliferated Warfighter Space Architecture (PWSA), a resilient military sensing and data transport capability via a proliferated space architecture in LEO. This program element funds the development and demonstration of space technologies to deliver advanced missile tracking, global surveillance and surface moving target custody, and enhanced space domain awareness and deterrence capabilities to U.S. joint warfighting forces in bi-annual tranches, which began in FY 2022.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Sensing	22.652	4.002	24.247
<p>Description: Develop and demonstrate payload prototypes compatible with a proliferated Low Earth Orbit (pLEO) architecture. This effort will focus on developing and demonstrating sensors for beyond-line-of-sight targeting, space-to-space data links, space-to-tactical data links, and advanced missile warning capabilities to enable enhanced space domain awareness. On-orbit demonstrations will be tied to existing mission-specific ground infrastructure, when it exists. Ground infrastructure will be linked or developed to support payload integration and data processing.</p>			
<p>FY 2024 Plans:</p> <p>Tranche 0:</p> <ul style="list-style-type: none"> - Continue to leverage operating Tranche 0 satellites to investigate potential developmental capabilities. - Continue to characterize high-resolution background clutter in wide range of spectral bands. - Continue to collect data to inform medium field of view (MFOV) and wide field of view (WFOV) trades. - Continue to demonstrate WFOV performance and cost that enables proliferation. <p>Tranche 1:</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206410SF / <i>Space Technology Development and Prototyping</i>	Project (Number/Name) 643732 / <i>Sensing</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>- Continue to integrate commercial and mission partners' satellite constellations into the Proliferated Warfighter Space Architecture (PWSA).</p> <p>FY 2025 Plans: Tranche 0:</p> <ul style="list-style-type: none"> - Continue to leverage operating Tranche 0 satellites to investigate potential developmental capabilities. - Continue to characterize high-resolution background clutter in wide range of spectral bands. - Continue to demonstrate Wide Field of View (WFOV) performance and cost that enables proliferation. <p>FY 2024 to FY 2025 Increase/Decrease Statement: The increase between the FY 2024 and the FY 2025 amount reflects final Tranche 0 Tracking Layer performer milestone payments.</p>			
<p>Title: Sabre</p> <p>Description: Sabre is a joint partnership executed/managed by Space Development Agency (SDA) and supported by the Office of the Secretary of Defense (OSD) Test Resource Management Center (TRMC) and United States Army Futures Command. This project will provide a three-space vehicle demonstration for space-based monitoring of telemetry data transmitted by vehicles under test (VUTs, missiles or interceptors) during flight testing. The Sabre Telemetry Relay payload module onboard the SDA NExT Low Earth Orbit (LEO) experimental testbed satellites will receive telemetry from VUTs during flight and relay it to range controllers on the ground.</p> <p>Sabre will demonstrate the ability to augment or replace DoD's decades-long approach of staging ships and airplanes along ground tracks of VUTs for the purpose of telemetry collection, tracking, and flight safety. In addition to reducing infrastructure cost, Sabre will also greatly enhance range test flexibility and improve test execution operational Security. The Sabre Telemetry Relay flight demonstration will leverage previously funded OSD TRMC and U.S. Army investments for payload design. This project will also consider other missions of opportunity to enhance Joint Warfighter capabilities in LEO.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Complete Program Milestone Reviews (PDR, CDR, MRR, TRR). - Complete Software Defined Radio (SDR) Build. - Complete Ground Control System Build. - Complete payload environmental testing. <p>FY 2025 Plans:</p> <ul style="list-style-type: none"> - Complete Test Readiness Review (TRR) and Pre-Ship Review (PRR) - Complete Flight Unit Delivery. 	21.252	64.000	3.114

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206410SF / <i>Space Technology Development and Prototyping</i>	Project (Number/Name) 643732 / <i>Sensing</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
- Complete System Acceptance Review (SRR).				
FY 2024 to FY 2025 Increase/Decrease Statement: The decrease from FY 2024 to FY 2025 is due to completion of program development and transition to demonstration.				
Title: Classified Projects		34.488	38.700	81.351
Description: Due to the classified nature of this project, specific details are available at a higher classification level.				
FY 2024 Plans: Due to the classified nature of this project, specific details are available at a higher classification level.				
FY 2025 Plans: Due to the classified nature of this project, specific details are available at a higher classification level.				
FY 2024 to FY 2025 Increase/Decrease Statement: Due to the classified nature of this project, specific details are available at a higher classification level.				
Accomplishments/Planned Programs Subtotals		78.392	106.702	108.712
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
Partners for these activities may include Missile Defense Agency (MDA), Space Systems Command (SSC), Space Operations Command (SpOC), Space Training and Readiness Command (STARCOM), Space Rapid Capabilities Office (SpRCO), DoD Combatant Commands, DoD research centers, small businesses, large defense contractors, commercial space providers, non-traditional aerospace and defense contractors, Federally Funded Research and Development Centers, and University Affiliated Research Centers.				

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206410SF / <i>Space Technology Development and Prototyping</i>	Project (Number/Name) 643732 / <i>Sensing</i>

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Sensing	
Complete the development of Tracking Tranche 0 space vehicles and integrate with Transport Layer.	
Launch and operations of Tranche 0 Tracking satellites.	
Conduct capstone demonstration to validate mission capabilities.	
Sabre	
Mission systems engineering and integration	
Payload development	
Procure and deliver space vehicle busses	
Bus and payload integration	
Launch Windows	
On-Orbit	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206410SF / <i>Space Technology Development and Prototyping</i>	Project (Number/Name) 643732 / <i>Sensing</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Sensing				
Complete the development of Tracking Tranche 0 space vehicles and integrate with Transport Layer.	1	2023	4	2025
Launch and operations of Tranche 0 Tracking satellites.	1	2023	1	2024
Conduct capstone demonstration to validate mission capabilities.	3	2023	4	2026
Sabre				
Mission systems engineering and integration	1	2023	1	2025
Payload development	1	2023	1	2024
Procure and deliver space vehicle busses	1	2023	4	2024
Bus and payload integration	4	2023	3	2024
Launch Windows	4	2025	1	2026
On-Orbit	4	2025	4	2026

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206425SF / <i>Space Situation Awareness Systems</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	213.884	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	213.884
640290: <i>Deep Space Advanced Radar Concept</i>	-	213.884	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	213.884
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

Space Domain Awareness (SDA) is one of five core competencies of the Space Force and is the effective identification, characterization, and understanding of any factor, passive or active, associated with the space domain that could affect space operations and thereby impact the security, safety, economy, or environment of our nation. As the foundation for space control, SDA encompasses surveillance of all space objects and activities; detailed surveillance of specific space assets; monitoring space environmental conditions; monitoring cooperative space assets; gathering indications and warning on adversary space operations; and conducting integrated command, control, communications, processing, analysis, dissemination, and archiving activities.

This program element develops new network sensors and improved information integration capabilities across the space surveillance network (SSN) while companion program element 1203940SF fields, upgrades, operationalizes, operates, and maintains Space Force sensors and information integration capabilities within the SSN. Activities funded in this program element (1206425SF) also support efforts such as engineering studies and analyses, architectural engineering studies, trade studies, technology needs forecasting, modernization initiatives, systems engineering, system development, and test & evaluation, and may include prototyping and technology demonstration.

Deep Space Advanced Radar Capability (DARC) is a ground-based, SDA radar system to detect, track, and maintain custody of deep space objects 24/7, through the solar exclusion gap. DARC will augment the SSN as an additional sensor with increased capacity and capability for deep space object custody, providing full global coverage.

In FY 2024, Deep Space Advanced Radar Concept efforts were transferred to Budget Authority 5 PE 1206425SF, Space Situation Awareness Systems, Project 656565, Ground Based SDA, in order to align it with other developmental SDA programs.

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

The total cost of the DARC Rapid Prototype Middle Tier of Acquisition (MTA) effort is 859.1 million. DARC Site 1 is not fully funded across the Future Years Defense Program. The Department of the Air Force is assessing all options to address the funding shortfalls for MTA programs including additional funding in a future budget request, performance trades based on technical maturity, or transition to alternative pathways.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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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 1206425SF / Space Situation Awareness Systems
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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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	221.421	0.000	0.000	0.000	0.000
Current President's Budget	213.884	0.000	0.000	0.000	0.000
Total Adjustments	-7.537	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	-7.537	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
Title: DARC Site 1 Operational Capability	213.884	0.000	0.000
Description: The DARC MTA activity will develop, test, and deliver one DARC site with a current estimated completion date of CY 2025. It will also provide a foundation for up to two more future sites located strategically around the world to provide global deep space radar capability to support SDA. The system will be responsive to regularly scheduled and un-scheduled tasks to locate, identify, characterize deep space objects and report the results to Battle Management Command and Control locations and SSN.			
FY 2024 Plans: In FY 2024, Deep Space Advanced Radar Concept efforts were transferred to Budget Authority 5 PE 1206425SF, Space Situation Awareness Systems, Project 656565, Ground Based SDA, in order to align it with other developmental SDA programs.			
FY 2025 Plans: In FY 2024, Deep Space Advanced Radar Concept efforts were transferred to Budget Authority 5 PE 1206425SF, Space Situation Awareness Systems, Project 656565, Ground Based SDA, in order to align it with other developmental SDA programs.			
FY 2024 to FY 2025 Increase/Decrease Statement: N/A			
Accomplishments/Planned Programs Subtotals			
	213.884	0.000	0.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force Date: March 2024

Appropriation/Budget Activity
3620F: Research, Development, Test & Evaluation, Space Force I BA 4:
Advanced Component Development & Prototypes (ACD&P)

R-1 Program Element (Number/Name)
PE 1206425SF / Space Situation Awareness Systems

D. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

E. Acquisition Strategy

Project utilizes existing DoD engineering and study contracts and activities to conduct science and technology development and data analysis activities. Preliminary/ critical design effort for the technology maturation and prototype commenced in FY 2017. A Broad Agency Announcement (BAA) was used to award seven Integrated System Engineering Team (ISET) contracts which allow for organizations to participate, advise the government, and gain insight into the prototype design and build. In May of 2019, DARC was designated as an MTA under Section 804 of the 2016 National Defense Authorization Act (NDAA). In 2020, DARC was directed to pursue a Rapid Prototyping Middle Tier Acquisition program for Site 1. The DARC Site effort will be executed through two separate contract elements: The Prime System Integrator (PSI) was awarded to Northrop Grunman Inc. via a single, competitive award through the Space Enterprise Consortium (SpEC) Other Transaction Authority (OTA) agreement and third-party software development through multiple SpEC OTA agreements. The Space Force intends to develop and field two additional DARC sites in the future to culminate in a final operational system of three global sites to ensure SDA coverage. A follow-on acquisition pathway strategy based on the success of the Site 1 rapid prototype and an MTA transition plan are being developed for Sites 2 and 3 in accordance with DoDI 5000.80.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force												Date: March 2024				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
3620F / 4				PE 1206425SF / Space Situation Awareness Systems				640290 / Deep Space Advanced Radar Concept								
Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
DARC Technical Mission Analysis	RO	Various : Various	-	9.104	Jan 2023	-		-		-		-	0.000	9.104	-	
DARC System Development	C/CPIF	Northrop Grumman : Colorado Springs, CO	-	193.406	Jan 2023	-		-		-		-	0.000	193.406	-	
Subtotal			-	202.510		-		-		-		-	0.000	202.510	N/A	
Support (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
DARC Prototype System and Sustainment Analyses	Various	Various : Various	-	1.046	May 2023	-		-		-		-	0.000	1.046	-	
Subtotal			-	1.046		-		-		-		-	0.000	1.046	N/A	
Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
A&AS	Various	Various : Various	-	7.881	Nov 2022	-		-		-		-	0.000	7.881	-	
FFRDC	RO	MITRE Corp. : Colorado Springs, CO	-	2.249	Nov 2022	-		-		-		-	0.000	2.249	-	
Other Support	Various	Various : Colorado Springs, CO	-	0.198	Nov 2022	-		-		-		-	0.000	0.198	-	
Subtotal			-	10.328		-		-		-		-	0.000	10.328	N/A	
Project Cost Totals			-	213.884		-		-		-		-	0.000	213.884	N/A	

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206425SF / <i>Space Situation Awareness Systems</i>	Project (Number/Name) 640290 / <i>Deep Space Advanced Radars Concept</i>

	FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>Prototype Risk Reduction Build and Test</i>																												
Site 1 Environmental Assessment	■																											
Software Development	■	■	■	■																								
Site 1 MTA Development	■	■	■	■																								
Site 1 Construction				■	■	■	■																					

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206425SF / <i>Space Situation Awareness Systems</i>	Project (Number/Name) 640290 / <i>Deep Space Advanced Radar Concept</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Prototype Risk Reduction Build and Test</i>				
Site 1 Environmental Assessment	1	2023	1	2023
Software Development	1	2023	4	2023
Site 1 MTA Development	1	2023	4	2023
Site 1 Construction	3	2023	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 1206427SF / Space Systems Prototype Transitions (SSPT)
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	203.679	145.948	133.739	0.000	133.739	105.407	77.992	58.179	59.328	Continuing	Continuing
644415: <i>On-Board Resiliency</i>	-	50.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
645601: <i>Space Defense Capabilities</i>	-	148.526	140.948	133.739	0.000	133.739	105.407	77.992	58.179	59.328	0.000	724.119
645611: <i>Assault Breaker II</i>	-	5.153	5.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.153

A. Mission Description and Budget Item Justification

The Space System Prototype Transition (SSPT) Program identifies and addresses space technology and capability gaps in order to facilitate technology transition of military space prototypes into programs of record. It conducts a wide array of activities to model, integrate, test, provide launch integration, and support on-orbit testing of prototype technologies. The supported activities include systems engineering, technology planning, development, demonstration and testing, as well as modeling, simulations, and exercises to support the development and maturation of tactics, techniques, and procedures (TTPs). This also includes the development and prototyping of critical technology within the Department of Defense (DoD) and across other government agencies, academic institutions, and identified industry partners, and the necessary systems engineering to effectively employ such systems.

Specifically, the SSPT Program establishes a cost-effective framework to identify, mature and transition demonstrations and prototypes to:

- Rapidly address identified technology or capability gaps
- Accelerate the maturation of systems intended for demonstrations/prototypes that enhance/compliment/replace existing capabilities
- Support a more reliable, available, maintainable, and survivable military space enterprise
- Energize the space industrial base supporting U.S. national security
- Focus Science and Technology (S&T) Innovation and facilitate its transition to military space programs of record

This program includes projects for Long Duration Propulsive Evolved Expendable Launch Vehicle (EELV) Secondary Payload Adapter (ESPA) (LDPE), LDPE's follow-on activity called Rapid On-Orbit Space Technology Evaluation Ring (ROOSTER), Tetra, Quasi-Zenith Satellite System—Hosted Payload (QZSS-HP), Space-To-Space Communications, rapidly prototype and space-qualify emerging CubeSat technology, and Assault Breaker II (ABII).

LDPE and ROOSTER provides a low-cost, rapid, and flexible on-orbit capability to host and deploy numerous prototypes and payloads utilizing excess payload margin available on US Space Force (USSF) launch missions. Each LDPE/ROOSTER on-orbit platform is currently designed to fly multiple payloads per mission, thus fully utilizing launch potential and providing the only recurring rideshare option for prototypes, demonstrations, and experiments to geosynchronous orbit. ROOSTER's predecessor program, the Long Duration Propulsive Evolved Expendable (EELV) Secondary Payload Adapter (ESPA) (LDPE), consisting of the LDPE-1, -2 and 3A mission concluded in FY2024. The objectives of the ROOSTER program are to enable rapid and cost-effective technology insertion into operational program of records

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force Date: March 2024

Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 1206427SF / Space Systems Prototype Transitions (SSPT)
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through the on-orbit checkout and testing of prototypes, demonstrations, and experimental payloads. Additionally, ROOSTER will work to mature operational concepts and TTPs, such as on-orbit refueling, for use within the USSF space enterprise architecture.

Tetra provides a training platform for operators to develop and demonstrate TTPs for pathfinder mission sets. This project directly supports the evolution of operations to include Space Domain Awareness (SDA) and Space Control in alignment with objectives from organizations such as the National Space Test and Training Complex (NSTTC) and USSF Test and Evaluation (TE).

QZSS-HP is a ""pacesetter"" hosted payload that is a high priority for the US and Japan, paving the way for future Allied collaborations. It enhances Geostationary Earth Orbit (GEO) SDA capabilities over the Eurasian theater and facilitates resilient capabilities in the Space Surveillance Network (SSN).

Space-to-Space Communications activity includes development of communications technologies to synchronize space-to-space Command and Control (C2) and data transport needs across the space community and enable system-agnostic communication pathways via a mobile ad-hoc network. It also enhances the Defense Advanced Research Projects Agency (DARPA) Space-Based Adaptive Communication Node (Space BACN) modem design to support long-range crosslinks and incorporate emerging optical waveform standards.

The CubeSat technology efforts develops innovative technologies that provide more capabilities than current existing CubeSat technologies. The goal is to mature each applicable capability to Technology Readiness Level (TRL) of 6 or higher (demonstration of system in a relevant environment), test and verify performance, define the specification and operational benefit, and inform relevant Space Systems Command (SSC) program offices of the new capability. The overall goal is to enhance small satellite capabilities as operational satellites miniaturize, meeting the Space Service Acquisition Executive's vision of delivering capabilities faster.

Digital Engineering Interconnected, Cloud-based Ecosystem (DEICE) Tech Stack prototypes and develops the Space Force Digital Engineering Ecosystem (DEE) as a cloud-based, remotely accessible, multilevel security, interconnected infrastructure, providing the technical methodology used to store, access, analyze, and visualize evolving systems' data and models throughout systems' acquisition lifecycles. In FY 2024, this activity transferred to PE 1203010SF, Space Force Information Technology (IT), Data Analysis, Digital Solutions, project 645620, Digital Engineering to improve transparency.

ABII is an all-Service, classified, multi-year effort, led by DARPA, to analyze, research, and recommend material and non-material all domain counter-Anti-Access/Area Denial (AA/AD) solutions to the Joint Requirements Oversight Council (JROC).

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

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.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206427SF / <i>Space Systems Prototype Transitions (SSPT)</i>
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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	166.427	145.948	130.404	0.000	130.404
Current President's Budget	203.679	145.948	133.739	0.000	133.739
Total Adjustments	37.252	0.000	3.335	0.000	3.335
• 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	37.252	0.000	3.335	0.000	3.335

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 644415: *On-Board Resiliency*

Congressional Add: *On-Board Resiliency: USSF-SpRCO*

Congressional Add: *On-Board Resiliency: USSF-SSC*

Congressional Add Subtotals for Project: 644415

Project: 645601: *Space Defense Capabilities*

Congressional Add: *Space-to-Space Communications (Congressional Add ESP Code: CZ)*

Congressional Add: *CubeSat Technologies (Congressional Add ESP Code: CZ)*

Congressional Add Subtotals for Project: 645601

Congressional Add Totals for all Projects

	FY 2023	FY 2024
	29.014	-
	20.986	0.000
	50.000	0.000
	9.648	0.000
	4.824	0.000
	14.472	0.000
	64.472	0.000

Change Summary Explanation

FY 2023: +10.000M; increase for LDPE, ROOSTER, and TETRA efforts.

FY 2023: +31.350M; Above Threshold Reprogramming increase for Space-To-Space Communication.

FY 2025: +3.067M increase for integration of QZSS Hosted Payload per US-Japan International Agreement

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206427SF / <i>Space Systems Prototype Transitions (SSPT)</i>	Project (Number/Name) 644415 / <i>On-Board Resiliency</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
644415: <i>On-Board Resiliency</i>	-	50.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Increase space vehicle survivability against current and future threats such as a suite of on-board capabilities with options for integration into their platforms. Develop technologies to increase satellite and enterprise resiliency such as enabling versatile communication pathways and responding to threats.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024
Congressional Add: On-Board Resiliency: USSF-SpRCO	29.014	-
FY 2023 Accomplishments: Deliver NSA-certified, next generation encryption modules for space capabilities. KG-505 4.0 is the software upgrade and the KG-505A is the hardware change that broadens scope to meet enterprise cryptography and resilience needs, evolving from the original KG-505 requirements to include quantum resistant solutions for onboard resiliency. The KG-505 4.0 contract is scheduled for award 1 March 2023 and the KG-505A is scheduled for award 15 Apr 2023. The KG-505 4.0 will be included with the new production contract.		
Funds to build out the ground system for resiliency payload and for the system integration support of resilience activities on the ground system.		
Congressional Add: On-Board Resiliency: USSF-SSC	20.986	0.000
FY 2023 Accomplishments: Develop technologies to increase satellite and enterprise resiliency such as enabling versatile communication pathways and responding to threats.		
FY 2024 Plans: N/A		
Congressional Adds Subtotals	50.000	0.000

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

Awarded competitive contracts in 4Q FY 2023 for resiliency technologies development. Also awarded FFRDC.

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206427SF / <i>Space Systems Prototype Transitions (SSPT)</i>	Project (Number/Name) 644415 / <i>On-Board Resiliency</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
KG-505				
Development	4	2023	4	2023
USSF-SSC				
Development	4	2023	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 4					R-1 Program Element (Number/Name) PE 1206427SF / <i>Space Systems Prototype Transitions (SSPT)</i>				Project (Number/Name) 645601 / <i>Space Defense Capabilities</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
645601: <i>Space Defense Capabilities</i>	-	148.526	140.948	133.739	0.000	133.739	105.407	77.992	58.179	59.328	0.000	724.119
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Space System Prototype Transition (SSPT) Program identifies and addresses space technology and capability gaps in order to facilitate technology transition of military space prototypes into programs of record. It conducts a wide array of activities to model, integrate, test, provide launch integration, and support on-orbit testing of prototype technologies. The supported activities include systems engineering, technology planning, development, demonstration and testing, as well as modeling, simulations, and exercises to support the development and maturation of tactics, techniques, and procedures (TTPs). This also includes the development and prototyping of critical technology within the Department of Defense (DoD) and across other government agencies, academic institutions, and identified industry partners, and the necessary systems engineering to effectively employ such systems.

Specifically, the SSPT Program establishes a cost-effective framework to identify, mature and transition demonstrations and prototypes to:

- Rapidly address identified technology or capability gaps
- Accelerate the maturation of systems intended for demonstrations/prototypes that enhance/compliment/replace existing capabilities
- Support a more reliable, available, maintainable, and survivable military space enterprise
- Energize the space industrial base supporting U.S. national security
- Focus Science and Technology (S&T) Innovation and facilitate its transition to military space programs of record

This program includes projects for Long Duration Propulsive Evolved Expendable Launch Vehicle (EELV) Secondary Payload Adapter (ESPA) (LDPE), LDPE's follow-on activity called Rapid On-Orbit Space Technology Evaluation Ring (ROOSTER), Tetra, Quasi-Zenith Satellite System—Hosted Payload (QZSS-HP), Space-To-Space Communications, and rapidly prototype and space-qualify emerging CubeSat technology.

LDPE and ROOSTER provides a low-cost, rapid, and flexible on-orbit capability to host and deploy numerous prototypes and payloads utilizing excess payload margin available on US Space Force (USSF) launch missions. Each LDPE/ROOSTER on-orbit platform is currently designed to fly multiple payloads per mission, thus fully utilizing launch potential and providing the only recurring rideshare option for prototypes, demonstrations, and experiments to geosynchronous orbit. ROOSTER's predecessor program, the Long Duration Propulsive Evolved Expendable (EELV) Secondary Payload Adapter (ESPA) (LDPE), consisting of the LDPE-1, -2 and 3A mission concluded in FY2024. The objectives of the ROOSTER program are to enable rapid and cost-effective technology insertion into operational program of records through the on-orbit checkout and testing of prototypes, demonstrations, and experimental payloads. Additionally, ROOSTER will work to mature operational concepts and TTPs, such as on-orbit refueling, for use within the USSF space enterprise architecture.

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206427SF / <i>Space Systems Prototype Transitions (SSPT)</i>	Project (Number/Name) 645601 / <i>Space Defense Capabilities</i>
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Tetra provides a training platform for operators to develop and demonstrate TTPs for pathfinder mission sets. This project directly supports the evolution of operations to include Space Domain Awareness (SDA) and Space Control in alignment with objectives from organizations such as the National Space Test and Training Complex (NSTTC) and USSF Test and Evaluation (TE).

QZSS-HP is a ""pacesetter"" hosted payload that is a high priority for the US and Japan, paving the way for future Allied collaborations. It enhances Geostationary Earth Orbit (GEO) SDA capabilities over the Eurasian theater and facilitates resilient capabilities in the Space Surveillance Network (SSN).

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The CubeSat technology efforts develops innovative technologies that provide more capabilities than current existing CubeSat technologies. The goal is to mature each applicable capability to Technology Readiness Level (TRL) of 6 or higher (demonstration of system in a relevant environment), test and verify performance, define the specification and operational benefit, and inform relevant Space Systems Command (SSC) program offices of the new capability. The overall goal is to enhance small satellite capabilities as operational satellites miniaturize, meeting the Space Service Acquisition Executive's vision of delivering capabilities faster.

ABII is an all-Service, classified, multi-year effort, led by DARPA, to analyze, research, and recommend material and non-material all domain counter-Anti-Access/Area Denial (AA/AD) solutions to the Joint Requirements Oversight Council (JROC).

Digital Engineering Interconnected, Cloud-based Ecosystem (DEICE) Tech Stack prototypes and develops the Space Force Digital Engineering Ecosystem (DEE) as a cloud-based, remotely accessible, multilevel security, interconnected infrastructure, providing the technical methodology used to store, access, analyze, and visualize evolving systems' data and models throughout systems' acquisition lifecycles. In FY 2024, this activity transferred to PE 1203010SF, Space Force Information Technology (IT), Data Analysis, Digital Solutions, project 645620, Digital Engineering to improve transparency.

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

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Title: Technology Maturation and Prototype Development</p> <p>Description: Plan, develop, test and transition advanced technologies into space system prototypes and capabilities to meet known and emerging threats. Conduct architecture studies, modeling and simulation, technical development, integration and test activities in preparation for transition of critical technologies into prototypes or space programs of record. Develop advanced capabilities for rapid prototyping and integration into space system programs of record and, if requested, to warfighter Urgent Operational Needs (UONs) and Joint Urgent Operational Needs (JUONs). Develop, test and integrate on-orbit platforms for</p>	66.080	61.934	41.963

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>checkout and testing of prototypes and experimental payloads to mature operational concepts and TTPs for future use in the USSF space enterprise architecture. Provide rideshare platform hosting opportunities to geosynchronous orbit. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - ROOSTER: Complete prototype development efforts for ROOSTER-4 Space Vehicle. Complete Space Vehicle integration and factory test campaign and launch vehicle mission unique development/integration efforts. Receive whole of program security accreditation efforts required for launch and on-orbit operations. Award ROOSTER-5 contract and begin development of space vehicle platform. - Tetra: Continue development of Tetra space vehicles to include development of Tetra-5 through integration and test and awarding Tetra-6. - QZSS-HP: Continue the international cooperation with Japan by integrating, testing, and launching two SDA payloads with two Japanese Quasi-Zenith Satellites. <p>FY 2025 Plans:</p> <ul style="list-style-type: none"> - ROOSTER: Support shipment and launch integration efforts for ROOSTER-4 Space Vehicle. Complete ground system integration and end-to-end testing in support of launch and on-orbit operations campaign. Continue prototype development, for the ROOSTER-5 mission, including ground segment and payload integration efforts. Begin Space Vehicle factory test campaign, launch vehicle mission unique integration efforts, and all program security accreditation efforts. - Tetra: Continue development of Tetra space vehicles to include development of Tetra-6 and complete Tetra-5. Prepare for storage of Tetra-3, -4 and -5 payloads pending updated launch plans. - QZSS-HP: Continue the international cooperation with Japan by integrating and testing the two SDA payloads with the two Japanese Quasi-Zenith Satellites. Support continuation of ground system and data communication development. <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to planned completion of Tetra and QZSS-HP efforts.</p>			
<p>Title: Prototype Integration, Test and On-Orbit Prototype Demonstration</p> <p>Description: Provide rideshare opportunities for prototypes and experiments, fund mission-unique payload integration to the rideshare or launch system, and conduct launch base integration, testing and launch operations. Conduct prototype integration and testing into the designated Command and Control system and provide operational support to conduct prototype testing, demonstration and operations.</p> <p>FY 2024 Plans:</p>	12.933	32.735	23.960

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>- ROOSTER: Complete development and assembly of the first ROOSTER platform (ROOSTER-4) to support FY 2025 launch and execution of on-orbit operations of prototype and technology demonstration payloads. Finalize and integrate ground segment and payloads to enable end-to-end system testing efforts. Finalize on-orbit satellite vehicle operations procedures development and conduct operations training, rehearsals, and exercises. Begin development on an integrated mission plan to support achievement of all prototype payload and space vehicle on-orbit objectives. Establish manifest of prototype and demonstration payloads for ROOSTER-5 mission.</p> <p>- Tetra: Continue development, integration, launch and operations of Tetra space vehicles to include launch and operations of Tetra 1 and 4.</p> <p>- QZSS-HP: Continue integration and testing in support of a Quasi-Zenith Satellite 7 launch in FY 2024. Conclude the integration, test and launch of both hosted payloads in cooperation with the Japanese government. Support on-orbit Developmental Test activities post launch to enable warfighter capabilities for both hosted payloads.</p> <p>FY 2025 Plans:</p> <p>- ROOSTER: Support launch of ROOSTER-4 aboard the USSF-43 mission and begin the planned 12-month on-orbit prototype testing and demonstration phase. Conduct on-orbit test and demonstration to enable technology maturation of the platform and prototype/experimental payloads. Begin operations training and testing activities of the second ROOSTER platform to support FY 2027 launch and execution of on-orbit operations of prototype and technology demonstration payloads. Begin early payload integration risk reduction efforts.</p> <p>- Tetra: Continue integration, storage and operations to support future launch of Tetra 3, 4, & 5 space vehicles in mid to late FY 2025 or later.</p> <p>- QZSS-HP: In cooperation with the Japanese government, continue and complete integration and testing of the two SDA payloads in support of Quasi-Zenith 6 & 7 launches in FY 2025. Support on-orbit Development Test activities post-launch to enable warfighter capabilities for both hosted payloads.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to planned completion of Tetra and QZSS-HP efforts.</p>				
<p>Title: Long Duration Propulsive ESPA (LDPE)</p> <p>Description: The LDPE platform provides a standard rideshare service for a wide variety of secondary payload options. It features 6 ports and accommodates ten to twelve fixed and/or separable prototype payloads. After the forward payload separates, the LDPE platform separates and propels to mission orbit, typically GEO, approximately 22,000 miles above the earth. The LDPE platform can maneuver to allow prototype/experimental payloads to be dropped off at different locations or remain hosted to the ring based on mission requirements.</p> <p>FY 2024 Plans:</p>		9.063	1.279	0.000

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>Complete planned 12-month execution of LDPE-2 and LDPE-3A on-orbit prototype testing, demonstration, and operational support for LDPE hosted payloads. Support the transition of LDPE-2 and LDPE-3A to operational and/or test USSF units to conduct residual operations.</p> <p>FY 2025 Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to the completion of LDPE-2 and LDPE-3A on-orbit operations. The ROOSTER program is the follow-on activity to LDPE.</p>				
<p>Title: Digital Engineering Interconnected, Cloud-based Ecosystem (DEICE) Tech Stack</p> <p>Description: The Digital Engineering (DE) tech stack provides a common cloud-base, remotely accessible, multi-level security, interconnected infrastructure. The DEICE tech stack provides specialized tools required to perform model based systems engineering (MBSE) activities to create system models, perform simulations, and analyze the results to accelerate the pace of acquisition across the lifecycle from requirements generation, to design reviews, through manufacturing and test, and finally supporting fielding with digital twins. The DEICE tech stack provides the program offices, government stakeholders, and industry partners with a common DE as a Service (DEaaS) capability. The building of the DEICE capabilities will be accomplished using 6-month increments based on Agile management techniques. The needed capabilities will be collected from across the SSC programs and stored in a Product Backlog. Twice a year, this list will be prioritized by an enterprise governance board to direct the activities of adding new capabilities to the Ecosystem. The capabilities will be delivered when competed, tested and approved.</p> <p>FY 2024 Plans: N/A</p> <p>FY 2025 Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: N/A</p>		14.628	0.000	0.000
<p>Title: Space-To-Space Communications</p> <p>Description: Continue Space-to-Space Communications activity includes development of communications technologies to synchronize space-to-space C2 and data transport needs across the space community and enable system agnostic communication pathways via a mobile ad-hoc network. Enhance the DARPA Space BACN modem design to support long-range</p>		30.000	5.000	67.816

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
crosslinks and incorporate emerging optical waveform standards. Perform environmental testing to characterize the impacts of operating in the space environment and to mitigate those impacts if design modifications are necessary.				
<p>FY 2024 Plans: Award contracts and begin development activities to enable the future Space-to-Space Data Transport network. Develop high-power amplifiers, low-Size, Weight, and Power Application-Specific Integrated Circuit (SWaP ASIC) photonic modems, and scalable affordable components for enterprise terminals. Continue elements begun under Space Combat Cloud, to include proliferating the enterprise standards, developing network topology and mesh Concept of Operations (CONOPS), and evolve concepts, preliminary designs, and enterprise architectural solutions. Continue program office and other related support activities that may include, but are not limited to, studies, technical analyses, experimentation, prototyping, operational testing, and participation/integration into joint warfighting exercises.</p> <p>FY 2025 Plans: Continue development of optical communication terminal prototypes through Other Transactional Agreements and fund the Optical Terminal Verification Testbed at MIT/LL. Develop interface controls and integration plans in preparation for a space-based prototype demonstration. Mature networking management of optical crosslinks in partnerships with other organizations. Enhance the DARPA Space BACN modem design to support long-range crosslinks and incorporate emerging optical waveform standards.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased due to ramp up of development efforts for optical communication prototypes and the simultaneous cooperative effort with DARPA to develop the Space BACN modem.</p>				
<p>Title: Front Door To Space</p> <p>Description: Seeks to invigorate collaborative culture with industry by creating access to partnering services for the Department of Defense (DoD) via host of budget and contracting vehicles.</p> <p>FY 2024 Plans: N/A</p> <p>FY 2025 Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: N/A</p>		1.350	0.000	0.000
<p>Title: Solar Power</p>		0.000	40.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206427SF / <i>Space Systems Prototype Transitions (SSPT)</i>	Project (Number/Name) 645601 / <i>Space Defense Capabilities</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Description: Solar Power</p> <p>FY 2024 Plans: Continue developing space-based solar power collection and transmission technology via a series of integrated demos and technology development/maturation efforts: 1) continue space flight demonstration of solar-to RF panel payload (take delivery of solar-to-RF payload emulator, validate payload for delivery, continue pre integration of payload-to-bus), 2) deliver thermal integrated demonstration for on-orbit demonstration, 3) initiate structural operational prototype based on results from scaled array payload demonstrations and validated models, 4) update operational prototype concept designs/analysis based on tile, rectenna, thermal and structure demonstrations and updated models, and 5) continue functional demonstrations for critical technologies in energy generation, deployable structures, thermal technology, RF transmission, and distributed control.</p> <p>FY 2025 Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Scope realignment into PE 1206616SF</p>			
Accomplishments/Planned Programs Subtotals	134.054	140.948	133.739

	FY 2023	FY 2024
<p>Congressional Add: Space-to-Space Communications (Congressional Add ESP Code: CZ)</p> <p>FY 2023 Accomplishments: Space-to-Space Communications activity includes development of communications technologies to synchronize space-to-space C2 and data transport needs across the space community and enable system agnostic communication pathways via a mobile ad-hoc network.</p> <p>FY 2024 Plans: N/A</p>	9.648	0.000
<p>Congressional Add: CubeSat Technologies (Congressional Add ESP Code: CZ)</p> <p>FY 2023 Accomplishments: Rapid prototyping and space qualification of emerging CubeSat technologies to mature a capability to a Department of Defense (DoD) Technology Readiness Level (TRL) of 6 or higher.</p> <p>FY 2024 Plans: N/A</p>	4.824	0.000
Congressional Adds Subtotals	14.472	0.000

C. Other Program Funding Summary (\$ in Millions)
N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206427SF / <i>Space Systems Prototype Transitions (SSPT)</i>	Project (Number/Name) 645601 / <i>Space Defense Capabilities</i>
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C. Other Program Funding Summary (\$ in Millions)

Remarks
The Tetra-5 contract award included three separate space vehicles, one funded by SSPT (5a) and the other two by AFRL (5b & 5c). AFRL Tetra-5c has now been repurposed to fulfill Tetra-6 mission.

D. Acquisition Strategy

All contracts funded in this program element will be awarded using competitive procedures to the maximum extent possible. The SSPT program consists of numerous projects in which the program office will leverage rapid prototyping authorities to the maximum extent possible.

The acquisition strategy for the follow-on effort for ROOSTER, was approved in 2Q FY 2022. A sole-source contract was awarded for ROOSTER 2Q FY 2023 which supports the ROOSTER-4 ILC 2Q FY 2025. The follow-on contract for ROOSTER-5 is planned to be awarded in 3Q FY 2024.

Tetra's acquisition strategy is based on an annualized satellite procurement, development, and launch integration effort. Each Tetra satellite is a unique design intended to further the capabilities of small-satellites and mature emerging technologies. The first two unique Tetras were procured simultaneously as the first award on Space Enterprise Consortium (SpEC) Other Transaction Authority (OTA), followed by two subsequent Tetra missions. Tetra 5a awarded in 4Q FY 2022. AFRL Tetra-5c has now been repurposed to fulfill Tetra-6 mission.

The QZSS-HP acquisition strategy is based on the development of two MIT LL prototype payloads and a strategic partnership with the government of Japan. The payloads will provide Space Domain Awareness (SDA) resilience for USSF as a contributing sensor, partial on-board processing to enable indications and warnings on tactical timelines, and rapid development with operational leave-behind. The performance of the payloads on orbit will inform requirements and accelerate design for follow on systems, as well as inform SDA Force Design and architecture.

For the Digital Engineering Interconnected, Cloud-based Ecosystem (DEICE) Tech Stack effort, the Space Force plans to employ agile software development practices and techniques, such as flexible requirements, frequent user interaction, and rapid delivery. The program will acquire tools and capabilities through an agile-based Rapid Delivery Framework that develops, integrates, and delivers new features and capabilities through 180-day program increments. To provide the cloud-based environment, an existing contract with Cloud One providers will be utilized to provide the software licenses, computer hosting, and cybersecurity. In addition, FFRDCs will provide expertise to develop needed Digital Engineering capabilities as well as optimizing the software configurations to support needed features. Finally, a current SBIR Phase 3 contract will be used to implement new Digital Engineering capabilities based on industry best practices including the management of the Product Backlog, assisting with on-boarding new programs, building training for new users, providing system admin support, and creating scripts and features allowing Digital Engineering activities to be automated.

The Space-to-Space (S2S) Communications acquisition strategy is to award agreements to multiple developers to develop beyond Low Earth Orbit optical crosslink terminal prototypes. These awards will occur on the Space Enterprise Consortium (SpEC) Other Transaction Authority (OTA) vehicle using a three-phased approach with potential down-selects occurring after Phase 1 and/or Phase 2. The total period of performance is planned for 34 months. In parallel, the project will fund further

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206427SF / <i>Space Systems Prototype Transitions (SSPT)</i>	Project (Number/Name) 645601 / <i>Space Defense Capabilities</i>

development of a low size, weight, and power optical modem developed under the DARPA Space BACN program to support long-range crosslinks and emerging waveform standards.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206427SF / <i>Space Systems Prototype Transitions (SSPT)</i>	Project (Number/Name) 645601 / <i>Space Defense Capabilities</i>
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
LDPE-1, 2 & 3A Launch Vehicle Integration & On-Orbit Anomaly Ops	Various	Various: Various : TBD	-	3.954	Dec 2022	0.267	Jan 2024	-		-		-	0.000	4.221	-
LDPE-2, 3A Ground Systems Development & On-Orbit Ops	Various	Various : Various : TBD	-	4.948	Dec 2022	1.001	Nov 2023	-		-		-	0.000	5.949	-
ROOSTER Development	C/FFP	Northrop Grumman : VA : TBD	-	26.054	Jan 2023	21.269	Jan 2024	27.032	Jan 2025	-		27.032	Continuing	Continuing	-
ROOSTER Launch Vehicle and Payload Integration, On-Orbit Anomaly Ops	C/CPFF	Northrop Grumman : VA : TBD	-	3.418	Jan 2023	13.460	Jan 2024	13.400	Jan 2025	-		13.400	Continuing	Continuing	-
ROOSTER Launch Vehicle Mission Unique, Ground Systems Development & On-Orbit Ops	C/Various	Various : Various : TBD	-	4.888	Jan 2023	8.472	Nov 2023	8.800	Jan 2025	-		8.800	Continuing	Continuing	-
Tetra 3 & 4 Development	C/FFP	York Space Systems : CO : TBD	-	0.197	Jan 2023	-		-		-		-	0.000	0.197	-
Tetra 5a Development	C/CPIF	Orion Space Solutions: CO : TBD	-	14.821	Feb 2023	8.292	Jan 2024	-		-		-	0.000	23.113	-
Tetra 5c Development	C/CPIF	Orion Space Solutions: CO : TBD	-	-		9.687	Jan 2024	2.000	Jan 2025	-		2.000	Continuing	Continuing	-
Tetra-1, 3, 4 & 5a Prototype Integration, Test & On-Orbit Prototype Demonstration	C/Various	Various : Various : TBD	-	1.078	Jan 2023	7.230	Jan 2024	1.000	Jan 2025	-		1.000	0.000	9.308	-
Tetra-1, 3 & 4 Payload Integration into LDPE/ROOSTER Ring	C/CPAF	Various : Various : TBD	-	1.330	Jan 2023	-		-		-		-	0.000	1.330	-
QZSS-HP Development, Integration & Ground System	Various	Various : Various : TBD	-	8.436	Nov 2022	14.042	Jan 2024	5.535	Nov 2024	-		5.535	Continuing	Continuing	-
QZSS-HP Payloads Shipping and Security (Japan)	Various	Various : Various : TBD	-	2.219	Nov 2022	3.573	Nov 2023	1.760	Jan 2025	-		1.760	Continuing	Continuing	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206427SF / <i>Space Systems Prototype Transitions (SSPT)</i>	Project (Number/Name) 645601 / <i>Space Defense Capabilities</i>
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Digital Engineering Ecosystem	Various	Not specified. : TBD	-	2.564	Jan 2023	-		-		-		-	0.000	2.564	-
Digital Engineering Space DEN	TBD	Not specified. : TBD	-	5.000	Jan 2023	-		-		-		-	0.000	5.000	-
Space-to-Space Communications (Congressional Add ESP: CZ)	C/TBD	TBD : TBD : TBD	-	9.527	Apr 2023	-		-		-		-	0.000	9.527	-
Space-to-Space Comm. Space Terminal	TBD	Various: Various : TBD	-	15.000	Nov 2023	5.020	Jan 2024	51.816	Jan 2025	-		51.816	Continuing	Continuing	-
Space-to-Space Comm. SDN C2 System	TBD	TBD : TBD : TBD	-	10.000	Feb 2024	-		12.000	Jan 2025	-		12.000	Continuing	Continuing	-
Space-to-Space Comm. Testbed	TBD	TBD : TBD : TBD	-	5.000	Mar 2024	-		2.100	Jan 2025	-		2.100	Continuing	Continuing	-
CubeSat (Congressional Add ESP: CZ)	C/TBD	TBD : TBD : TBD	-	4.824	Jan 2024	-		-		-		-	0.000	4.824	-
MANTA	C/CPFF	Gen. Dynamics: CA : TBD	-	6.298	Sep 2023	-		-		-		-	0.000	6.298	-
Solar Power	C/CPAF	TBD: TBD : TBD	-	-		40.000	Mar 2024	-		-		-	0.000	40.000	-
Technical Mission Analysis	Various	Various : Various : TBD	-	4.018	Jan 2023	3.388	Jan 2024	2.937	Jan 2025	-		2.937	Continuing	Continuing	-
Subtotal			-	133.574		135.701		128.380		-		128.380	Continuing	Continuing	N/A

Remarks

The Tetra-5 contract award included three separate space vehicles, one funded by SSPT (5a) and the other two by AFRL (5b & 5c).

Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
FFRDC	RO	Various : Various : TBD	-	2.959	Jan 2023	1.282	Jan 2024	1.026	Jan 2025	-		1.026	Continuing	Continuing	-

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force			Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206427SF / <i>Space Systems Prototype Transitions (SSPT)</i>	Project (Number/Name) 645601 / <i>Space Defense Capabilities</i>	

	FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
LDPE-1																												
Launch/Ops																												
LDPE-2																												
Launch/Ops																												
LDPE-3A																												
Development & Integration																												
Launch/Ops																												
ROOSTER-4																												
Development																												
Integration																												
Launch/Ops																												
ROOSTER-5																												
Development																												
Integration																												
Launch/Ops																												
Tetra-1																												
Launch/Ops																												
Tetra-2																												
Development																												
Tetra-3																												
Development & Integration																												
Launch/Ops																												
Tetra-4																												
Development																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206427SF / <i>Space Systems Prototype Transitions (SSPT)</i>	Project (Number/Name) 645601 / <i>Space Defense Capabilities</i>
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	FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Integration																												
Launch/Ops																												
Tetra-5a																												
Development																												
Integration																												
Launch/Ops																												
Tetra-5c																												
Development																												
Integration																												
Launch/Ops																												
QZS 6-Hosted Payload																												
Development																												
Integration																												
Launch/Ops																												
QZS 7-Hosted Payload																												
Development																												
Integration																												
Launch/Ops																												
Space Combat Cloud																												
Development																												
DEICE Tech Stack																												
Platform Compute and Store																												
Minimum Viable Product - Development																												
Increment 1																												
Integration & Operations																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206427SF / <i>Space Systems Prototype Transitions (SSPT)</i>	Project (Number/Name) 645601 / <i>Space Defense Capabilities</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
LDPE-1				
Launch/Ops	1	2023	3	2024
LDPE-2				
Launch/Ops	1	2023	3	2024
LDPE-3A				
Development & Integration	1	2023	1	2023
Launch/Ops	2	2023	3	2024
ROOSTER-4				
Development	1	2023	4	2024
Integration	3	2024	3	2025
Launch/Ops	3	2025	3	2026
ROOSTER-5				
Development	3	2024	2	2026
Integration	2	2026	4	2027
Launch/Ops	4	2027	4	2028
Tetra-1				
Launch/Ops	1	2023	2	2024
Tetra-2				
Development	1	2023	2	2024
Tetra-3				
Development & Integration	1	2023	3	2025
Launch/Ops	3	2025	3	2026

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206427SF / <i>Space Systems Prototype Transitions (SSPT)</i>	Project (Number/Name) 645601 / <i>Space Defense Capabilities</i>
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Tetra-4</i>				
Development	1	2023	3	2024
Integration	3	2024	1	2025
Launch/Ops	2	2025	3	2026
<i>Tetra-5a</i>				
Development	1	2023	2	2025
Integration	2	2025	3	2025
Launch/Ops	3	2025	3	2027
<i>Tetra-5c</i>				
Development	2	2024	4	2026
Integration	1	2026	4	2027
Launch/Ops	1	2028	4	2029
<i>QZS 6-Hosted Payload</i>				
Development	1	2023	2	2023
Integration	2	2023	2	2025
Launch/Ops	2	2025	4	2029
<i>QZS 7-Hosted Payload</i>				
Development	1	2023	4	2023
Integration	4	2023	3	2025
Launch/Ops	3	2025	4	2029
<i>Space Combat Cloud</i>				
Development	1	2023	4	2024
<i>DEICE Tech Stack</i>				
Platform Compute and Store	2	2023	4	2023
Minimum Viable Product - Development	2	2023	3	2023

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206427SF / <i>Space Systems Prototype Transitions (SSPT)</i>	Project (Number/Name) 645601 / <i>Space Defense Capabilities</i>
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Increment 1	4	2023	4	2023
Integration & Operations	4	2023	4	2023
<i>Space-to-Space Communications (Congressional Add ESP Code: CZ)</i>				
Development	3	2023	2	2024
<i>Space-to-Space Communications</i>				
Space Terminals	1	2024	2	2027
SDN C2 System	2	2025	4	2026
Comm Testbed	2	2025	4	2027
<i>CubeSat</i>				
Development	4	2023	4	2024
<i>Solar Power</i>				
Development	2	2024	4	2025

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206427SF / <i>Space Systems Prototype Transitions (SSPT)</i>	Project (Number/Name) 645611 / <i>Assault Breaker II</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
645611: <i>Assault Breaker II</i>	-	5.153	5.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.153
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

Assault Breaker II (ABII) is an all-Service, classified, multi-year effort, led by DARPA, to analyze, research, and recommend material and non-material all domain counter-anti-access/area denial solutions to the Joint Requirements Oversight Council (JROC).

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Assault Breaker II	5.153	5.000	0.000
Description: Assault Breaker II is an all-Service, classified, multi-year effort, led by DARPA, to analyze, research, and recommend material and non-material all domain counter-anti-access/area denial solutions to the JROC.			
FY 2024 Plans: Provide warfighter analysis, experiments, and development of modeling and simulation tools to support warfighting objectives established by DARPA.			
FY 2025 Plans: Provide warfighter analysis, experiments, and development of modeling and simulation tools to support warfighting objectives established by OSD (R&E).			
FY 2024 to FY 2025 Increase/Decrease Statement: Decreased due to level of maturity of the program and transition to OSD (R&E).			
Accomplishments/Planned Programs Subtotals	5.153	5.000	0.000

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

Funds are sent to DARPA via a Military Interdepartmental Purchase Request (MIPR). The effort will transition from DARPA to OSD(R&E) in FY25 in accordance with a future Memorandum of Understanding to codify USSF (Service) obligations continuing analysis and development efforts.

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206427SF / <i>Space Systems Prototype Transitions (SSPT)</i>	Project (Number/Name) 645611 / <i>Assault Breaker II</i>

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>Assault Breaker II</i>	
Development	[REDACTED]

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206427SF / <i>Space Systems Prototype Transitions (SSPT)</i>	Project (Number/Name) 645611 / <i>Assault Breaker II</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Assault Breaker II</i>				
Development	1	2023	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206438SF / <i>Space Control Technology</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	48.560	58.374	62.195	0.000	62.195	62.590	63.563	65.854	67.153	Continuing	Continuing
642611: <i>Technology Insertion Planning and Analysis</i>	-	48.560	31.621	36.187	0.000	36.187	36.190	36.937	38.271	39.025	Continuing	Continuing
646438: <i>Joint Space Integration Technology</i>	-	0.000	26.753	26.008	0.000	26.008	26.400	26.626	27.583	28.128	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project supports a range of activities including systems engineering, technology planning, development, demonstrations and prototyping, and testing, as well as modeling, simulations and exercises to support development and maturation of tactics and procedures for a responsive and resilient Space Control mission area. This includes technology development and prototyping for Defensive Counterspace (DCS) and Offensive Counterspace (OCS) and the necessary systems engineering for the warfighter to effectively employ such systems.

Specifically supported are DCS and Space Domain Awareness (SDA) activities, which include developing threat warning payloads for monitoring, detecting, identifying, tracking, assessing, verifying, categorizing, and characterizing objects and events in space. Additionally, Integration and Technology Futures program supports the development of payload prototypes and space defense force packages for protecting U.S. space systems, resources, and operations from enemy attempts to negate, interfere, or destroy them.

Specific OCS activities include disruption, denial, or degradation (and associated Electronic Support) of adversary space systems that may be used for purposes hostile to U.S. national security interests. Rapid Reaction Capabilities in response to immediate warfighter needs in the Space Control mission area are developed within the Rapid Reaction Branch (RRB). Depending on the magnitude of Combatant Command Urgent Operational Needs (UON), this program may not include necessary funding for all contingency deployments. As required, necessary funding will be requested through established Joint Urgent Operational Need (JUON) and Overseas Contingency Operations (OCO) processes.

Joint Space Integration Technology leverages knowledge of the space environment and impacts on weapon systems to prototype, develop, test, and field joint multi-domain software and modeling solutions to fill capability gaps for Combatant Commanders. Military Application of the Space Environment (MASE) project consolidates and integrates current space environment science and technology advancements to provide capability for joint force systems in all domains to address immediate and evolving threats to U.S. forces operating in harm's way. The data provided supports rapid and agile demonstrations, exercises, and war games that provide essential validation of delivered capabilities to improve operational effectiveness.

In FY 2024, a portion of Project 642611, Technology Insertion Planning and Analysis efforts was transferred to Project 646438, Joint Space Integration Technology for transparency.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206438SF / <i>Space Control Technology</i>
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This program element may include necessary civilian pay expenses required to manage, execute, and deliver SCT weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 1206392SF and 1206398SF.

This 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)	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025 Base</u>	<u>FY 2025 OCO</u>	<u>FY 2025 Total</u>
Previous President's Budget	50.303	58.374	62.086	0.000	62.086
Current President's Budget	48.560	58.374	62.195	0.000	62.195
Total Adjustments	-1.743	0.000	0.109	0.000	0.109
• 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	-1.743	0.000			
• Other Adjustments	0.000	0.000	0.109	0.000	0.109

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 642611: *Technology Insertion Planning and Analysis*

Congressional Add: *NEXT-C Gridded Ion Thruster Development*

	<u>FY 2023</u>	<u>FY 2024</u>
	1.930	-
Congressional Add Subtotals for Project: 642611	1.930	-
Congressional Add Totals for all Projects	1.930	-

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 4					R-1 Program Element (Number/Name) PE 1206438SF / <i>Space Control Technology</i>				Project (Number/Name) 642611 / <i>Technology Insertion Planning and Analysis</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
642611: <i>Technology Insertion Planning and Analysis</i>	-	48.560	31.621	36.187	0.000	36.187	36.190	36.937	38.271	39.025	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project supports a range of activities including systems engineering, technology planning, development, demonstrations and prototyping, and testing, as well as modeling, simulations and exercises to support development and maturation of tactics and procedures for a responsive and resilient Space Control mission area. This includes technology development and prototyping for Defensive Counterspace (DCS) and Offensive Counterspace (OCS) and the necessary systems engineering for the warfighter to effectively employ such systems.

Specifically supported are DCS and Space Domain Awareness (SDA) activities, which include developing threat warning payloads for monitoring, detecting, identifying, tracking, assessing, verifying, categorizing, and characterizing objects and events in space. Additionally, Integration and Technology Futures program supports the development of payload prototypes and space defense force packages for protecting U.S. space systems, resources, and operations from enemy attempts to negate, interfere, or destroy them.

Specific OCS activities include disruption, denial, or degradation (and associated Electronic Support) of adversary space systems that may be used for purposes hostile to U.S. national security interests. Rapid Reaction Capabilities in response to immediate warfighter needs in the Space Control mission area are developed within the Rapid Reaction Branch (RRB). Depending on the magnitude of Combatant Command Urgent Operational Needs (UON), this program may not include necessary funding for all contingency deployments. As required, necessary funding will be requested through established Joint Urgent Operational Need (JUON) and Overseas Contingency Operations (OCO) processes.

Joint Space Integration Technology leverages knowledge of the space environment and impacts on weapon systems to prototype, develop, test, and field joint multi-domain software and modeling solutions to fill capability gaps for Combatant Commanders. Military Application of the Space Environment (MASE) project consolidates and integrates current space environment science and technology advancements to provide capability for joint force systems in all domains to address immediate and evolving threats to U.S. forces operating in harm's way. The data provided supports rapid and agile demonstrations, exercises, and war games that provide essential validation of delivered capabilities to improve operational effectiveness. In FY 2024, the Joint Space Integration Technology effort was transferred out of Project 642611 into a new Project 646438 for transparency.

In FY 2024, a portion of Project 642611, Technology Insertion Planning and Analysis efforts was transferred from Project 646438, Joint Space Integration Technology for transparency.

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

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206438SF / <i>Space Control Technology</i>	Project (Number/Name) 642611 / <i>Technology Insertion Planning and Analysis</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Title: Rapid Reaction Branch</p> <p>Description: Develops advanced capabilities for rapid prototyping and integration into space control programs of record and, if requested, to warfighter UONs and JUONs. Conducts prototype capability development, testing, training and rapid transition of technology and techniques to space control systems. Sustains deployed quick reaction capabilities until transition to program of record or mission completion.</p> <p>FY 2024 Plans: Develop, test, train, field, transition and sustain advanced rapid reaction capabilities in response to emergent requirements from multiple Combatant Commands. Conduct initial technical development and integration activities against relevant threat systems and technologies in preparation for operational requirements. Develop and test advanced prototypes in support of activities within the Space Control Technology portfolio. Based on technological advances relevant to the mission area, develop, integrate and evaluate next generation capabilities into Ground Reference Architecture (GRA) Increment 6. Develop, test, train, deliver and sustain urgent/emergent operational needs using Increment 5 or Increment 6 GRA technologies as appropriate for urgent need timelines, and start Increment 6. Integrate information assurance constructs and controls into developmental platforms and architecture to expedite fielding. Execute remote and field development & test activities using remote development sites to verify system performance in the operational environment and stay abreast of emerging technologies. Enhance fielded rapid reaction capabilities in response to evolving threats and operator feedback.</p> <p>Additionally, FY 2024 funding will support three remote development site activities located in the USEUCOM, USCENTCOM, and USINDOPACOM AORs further enabling the program to pace the threat and rapidly deliver critical warfighting capabilities in the contested space domain. Activities may include, but are not limited to: on-site security and communications support, technical analysis, risk reduction experiments and prototyping, development, integration and test of C2 architecture, travel and administrative office and laboratory support.</p> <p>FY 2025 Plans: Develop, test, train, field, transition and sustain advanced rapid reaction capabilities in response to emergent requirements from multiple Combatant Commands. Conduct initial technical development and integration activities against relevant threat systems and technologies in preparation for operational requirements. Develop and test advanced prototypes in support of activities within the Space Control Technology portfolio. Based on technological advances relevant to the mission area, develop, integrate, and evaluate next generation capabilities into Ground Reference Architecture (GRA) Increment 6. Develop, test, train, deliver and sustain urgent/emergent operational needs using Increment 6 GRA technologies for urgent need timelines. Integrate information assurance constructs and controls into developmental platforms and architecture to expedite fielding. Execute remote and field development & test activities using remote development sites to verify system performance in the operational environment and</p>	12.177	18.672	22.081

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206438SF / <i>Space Control Technology</i>	Project (Number/Name) 642611 / <i>Technology Insertion Planning and Analysis</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>stay abreast of emerging technologies. Enhance fielded rapid reaction capabilities in response to evolving threats and operator feedback.</p> <p>Additionally, FY 2025 funding will allow the program to support DevSecOps activities fully utilizing all three remote development sites located in the USEUCOM, USCENTCOM, and USINDOPACOM AORs further enabling the program to pace the threat and rapidly deliver critical warfighting capabilities in the contested space domain. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain, leveraging commercial and international opportunities, if appropriate. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased due to the addition of three remote development sites supporting research and development activities in an operational environment to further speed development and delivery of capabilities to the warfighter.</p>			
<p>Title: Integration and Technology Futures</p> <p>Description: Foundational architecture and prototype development to enable the integration, interoperability and compatibility of new Space Control Technology into space systems. Funds sensor and other capability technologies for transition into programs to meet space control mission requirements.</p> <p>FY 2024 Plans: Capture OCS and DCS enterprise capabilities in digital engineering models that represent the space enterprise assets, operations, related key performance characteristics, and threat response. Exercise the digital engineering models and establish secure networks for data sharing with mission partners to analyze the performance, operational capabilities, and interdependencies of space systems at the enterprise level to inform the counter-space mission areas. Define standards and perform various digital engineering functions, tools, procedures, and best practices to accelerate acquisition of successful and affordable counter-space systems.</p> <p>Conduct IRON JAR space experimentation activities with programs of record and mission partners to demonstrate and evaluate space technologies, mature space operations processes, conduct operator training, develop tactics, techniques, and procedures (TTPs), and validate digital engineering models. Identify and prioritize solution development of new space technologies. FY 2024 funding will allow the program to rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain.</p>	14.239	12.949	14.106

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206438SF / <i>Space Control Technology</i>	Project (Number/Name) 642611 / <i>Technology Insertion Planning and Analysis</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>Activities may include, but are not limited to: studies, technical analysis, risk reduction experiments, prototype development, technology transition, integration and test of command and control (C2), resiliency measures and mission partner interfaces, space test/combat range events, and office support etc.</p> <p>FY 2025 Plans: Conduct IRON JAR space experimentation activities with programs of record and mission partners to demonstrate and evaluate space technologies, mature space operations processes, conduct operator training, develop TTPs and validate digital engineering models. Identify and prioritize solution development of new space technologies. FY 2025 funding will allow warfighter test and training activities utilizing an on-orbit asset to refine the DCS mission.</p> <p>Conduct systems engineering activities to allow Space Systems Command (SSC) to link its individual space defense programs into one combined "system of systems" capable of fighting a war together.</p> <p>Conduct Battle Management Kill Chain (BMKC) modeling, including Campaign or Performance-level analyses for Space Domain Awareness and Combat Power (SDACP). This will allow SSC to conduct BMKC modeling, update threat information, and incorporate Space Domain Awareness (SDA) and Command and Control (C2) updates into the existing BMKC model. Additionally, SSC will be able to model the complete "protect and defend" architecture for the National Security Space Enterprise (NSSE).</p> <p>Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased due to inclusion of BMKC modeling activities.</p>				
<p>Title: Military Application of the Space Environment (MASE)</p> <p>Description: MASE provides commanders an operational risk assessment tool to improve air and maritime campaign mission effectiveness. Develops, tests, and delivers weapon system tailored visualizations/decision aids supporting operational level mission planning and tactical execution.</p> <p>FY 2024 Plans: N/A</p> <p>FY 2025 Plans:</p>		20.214	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206438SF / <i>Space Control Technology</i>	Project (Number/Name) 642611 / <i>Technology Insertion Planning and Analysis</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
N/A			
FY 2024 to FY 2025 Increase/Decrease Statement: N/A			
Accomplishments/Planned Programs Subtotals	46.630	31.621	36.187

	FY 2023	FY 2024
Congressional Add: NEXT-C Gridded Ion Thruster Development	1.930	-
FY 2023 Accomplishments: Project will continue partnership with NASA to develop and improve gridded ion thruster hardware based on the NASA Evolutionary Xenon Thruster - Commercial (NEXT-C) hardware development contract. The objective for the project is to develop and test key components of a higher Thrust-to-Power (T/P) NEXT derivative for dual commercial and military applications. Development is planned to include the two key components of a propulsion system, including NEXT-C electric propulsion device and the associated higher power processing unit (PPU).		
Congressional Adds Subtotals	1.930	-

C. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

D. Acquisition Strategy

All contracts funded in this program element will be awarded using competitive procedures to the maximum extent possible. NEXT-C Gridded Ion Thruster Development will be awarded on existing NASA Glenn Research Center contract.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force												Date: March 2024			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
3620F / 4				PE 1206438SF / Space Control Technology				642611 / Technology Insertion Planning and Analysis							
Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
SCT Counterspace Technology Prototyping/ Rapid Reaction Development	Various	Various : Various	-	11.543	Dec 2022	16.606	Oct 2023	19.694	Oct 2024	-		19.694	Continuing	Continuing	-
SCT Integration and Technology Futures	C/Various	Various : Various	-	14.104	Dec 2022	12.282	Oct 2023	13.315	Oct 2024	-		13.315	Continuing	Continuing	-
NEXT-C Gridded Ion Thruster Development	MIPR	NASA Glenn Research Ctr : Cleveland, OH	-	1.930	Jan 2024	-		-		-		-	0.000	1.930	-
MASE	Various	Various : Various	-	19.153	Nov 2022	-		-		-		-	0.000	19.153	-
SBIR/STTR	Allot	Not specified. : TBD	-	-		1.107	Oct 2023	1.303	Oct 2024	-		1.303	Continuing	Continuing	-
Subtotal			-	46.730		29.995		34.312		-		34.312	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
A&AS	Various	Various : Various	-	1.416	Jan 2023	1.626	Jan 2024	1.775	Jan 2025	-		1.775	Continuing	Continuing	-
FFRDC	RO	Aerospace : El Segundo, CA	-	0.255	Apr 2023	-		-		-		-	0.000	0.255	-
Other Support	Various	Various : El Segundo, CA	-	0.159		-		0.100	Nov 2024	-		0.100	Continuing	Continuing	-
Subtotal			-	1.830		1.626		1.875		-		1.875	Continuing	Continuing	N/A
Project Cost Totals			-	48.560		31.621		36.187		-		36.187	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206438SF / <i>Space Control Technology</i>	Project (Number/Name) 642611 / <i>Technology Insertion Planning and Analysis</i>

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

RRB	
Rapid Prototyping/Demo/Testing/Fielding & Transition of UON/JUON/JEON Weapon System Capabilities- Ongoing Tests & DT Planning and Execution	
Remote Development Site x3 Design/ Integrate/Support	
Signal Processing Lab GRA (dev) Increment 5	
Signal Processing Lab GRA (dev) Increment 6	
Signal Processing Lab GRA (dev) Increment 7	
Integration and Technology Futures	
Enterprise Systems Engineering	
IRON JAR	
Space Control Technology Development & Transition	
Congressional Add	
NEXT-C Gridded Ion Thruster Development	
MASE	
Development	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206438SF / <i>Space Control Technology</i>	Project (Number/Name) 642611 / <i>Technology Insertion Planning and Analysis</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
RRB				
Rapid Prototyping/Demo/Testing/Fielding & Transition of UON/JUON/JEON Weapon System Capabilities- Ongoing Tests & DT Planning and Execution	1	2023	4	2029
Remote Development Site x3 Design/Integrate/Support	1	2023	4	2029
Signal Processing Lab GRA (dev) Increment 5	1	2023	2	2024
Signal Processing Lab GRA (dev) Increment 6	4	2023	1	2027
Signal Processing Lab GRA (dev) Increment 7	3	2026	4	2029
Integration and Technology Futures				
Enterprise Systems Engineering	1	2023	4	2029
IRON JAR	1	2023	4	2029
Space Control Technology Development & Transition	1	2023	4	2029
Congressional Add				
NEXT-C Gridded Ion Thruster Development	1	2023	4	2024
MASE				
Development	1	2023	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 4					R-1 Program Element (Number/Name) PE 1206438SF / <i>Space Control Technology</i>				Project (Number/Name) 646438 / <i>Joint Space Integration Technology</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
646438: <i>Joint Space Integration Technology</i>	-	0.000	26.753	26.008	0.000	26.008	26.400	26.626	27.583	28.128	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Joint Space Integration Technology leverages knowledge of the space environment and impacts on weapon systems to prototype, develop, test, and field joint multi-domain software and modeling solutions to fill capability gaps for Combatant Commanders. Military Application of the Space Environment (MASE) project consolidates and integrates current space environment science and technology advancements to provide capability for joint force systems in all domains to address immediate and evolving threats to U.S. forces operating in harm's way. The data provided supports rapid and agile demonstrations, exercises, and war games that provide essential validation of delivered capabilities to improve operational effectiveness.

In FY 2024, the MASE portion of Project 642611, Technology Insertion Planning and Analysis efforts was transferred to Project 646438, Joint Space Integration Technology for transparency.

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

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Military Application of the Space Environment (MASE)	0.000	26.753	26.008
Description: The goal, mission and purpose of the Military Application of the Space Environment (MASE) Program is to design, develop, and field a decision aid to support air and maritime scheme of maneuver in a battlespace and satisfy the needs of multiple combatant commanders, service components, and the intelligence community.			
MASE provides commanders an operational risk assessment tool to improve air and maritime campaign mission effectiveness. Develops, tests, and delivers weapon system tailored visualizations/decision aids supporting operational level mission planning and tactical execution.			
FY 2024 Plans: Research, develop and validate software for enhanced modeling and simulation of regional ionospheric and signal propagation effects to forecast space domain impacts on joint force weapon systems. Integrate model output into weapon system tailored visualizations to improve multi-domain mission planning and execution. Complete software development of Major Release 1.3 and begin development of software for Major Release 1.4 of new capabilities and validate results during campaign planning, exercises,			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206438SF / <i>Space Control Technology</i>	Project (Number/Name) 646438 / <i>Joint Space Integration Technology</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>and war games. Develop, test, and provide training for new or updated tactics, techniques, and procedures enhanced by MASE for operational users. Integrate new traditional and non-traditional data sources into models to improve space warfighting decision processes. Rapidly develop, test, and deploy new system features in response to continuously evolving threats to U.S. forces.</p> <p><i>FY 2025 Plans:</i> Research, develop and validate software for enhanced modeling and simulation of regional ionospheric and signal propagation effects to forecast space domain impacts on joint force weapon systems. Integrate model output into weapon system tailored visualizations to improve multi-domain mission planning and execution. Complete software development of Major Release 1.4, and begin development of software for Major Release 1.5 of new capabilities and validate results during campaign planning, exercises, and war games. Expand MASE accessibility to Top Secret networks. Develop, test, and provide training for new or updated tactics, techniques, and procedures enhanced by MASE for operational users. Integrate new traditional and non-traditional data sources into models to improve space warfighting decision processes. Rapidly develop, test, and deploy new system features in response to continuously evolving threats to U.S. forces.</p> <p>Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p><i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> FY 2025 decreased due to partial completion of developmental test requirements.</p>			
Accomplishments/Planned Programs Subtotals	0.000	26.753	26.008

C. Other Program Funding Summary (\$ in Millions)
 N/A

Remarks

D. Acquisition Strategy
 All contracts funded in this program element will be awarded using competitive procedures to the maximum extent possible. The SE&I contract uses the Defense Technical Information Center (DTIC) Information Analysis Center (IAC) Multiple Award Contract (MAC) and runs March 2020-March 2025. The current year software development uses the Modeling, Simulation & Analysis (MS&A) for Space and Cyberspace Capabilities (MSCC) contract through 2024. The USSF plans to use a Small Business Innovation Research Phase 3 contract to extend the effort into 2028. All modeling, simulation and demonstration contracts are awarded through the Air Force Research Lab's (AFRL) competitive processes. The application infrastructure/online services are a combination of MACs through the USAF Platform One Program, the Department of the Air Force Cloudworks Program and the USAF Commercial Cloud Enterprise (C2E) Program. Test and evaluation tasks will be accomplished on existing competitively awarded USSF, USAF, and USN contracts.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206438SF / <i>Space Control Technology</i>	Project (Number/Name) 646438 / <i>Joint Space Integration Technology</i>
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MASE Systems Engineering & Integration (SE&I)	Various	Various : Colorado Springs, CO	-	-		5.933	Oct 2023	6.520	Nov 2024	-		6.520	Continuing	Continuing	-
MASE Software Development	Various	DSoft Technologies : Colorado Springs, CO	-	-		2.134	Oct 2023	4.279	Nov 2024	-		4.279	Continuing	Continuing	-
MASE Modeling, Simulation and Demonstration	Various	Various : Various	-	-		11.679	Oct 2023	10.928	Nov 2024	-		10.928	Continuing	Continuing	-
MASE Application Infrastructure/Online Services	Various	Various : Various	-	-		1.412	Oct 2023	1.390	Oct 2024	-		1.390	Continuing	Continuing	-
Technical Mission Analysis	RO	Not specified. : TBD	-	-		-		0.268	Oct 2024	-		0.268	Continuing	Continuing	-
SBIR/STTR	Allot	Not specified. : TBD	-	-		0.936	Oct 2023	0.936	Oct 2024	-		0.936	Continuing	Continuing	-
Subtotal			-	-		22.094		24.321		-		24.321	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MASE Developmental/Operational Testing	Various	Various : Various	-	-		3.467	Dec 2023	0.361	Oct 2024	-		0.361	Continuing	Continuing	-
Subtotal			-	-		3.467		0.361		-		0.361	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
A&AS	Various	Various : El Segundo, CA	-	-		0.832	Nov 2023	0.912	Mar 2025	-		0.912	Continuing	Continuing	-
FFRDC	RO	Aerospace Corp. : El Segundo, CA	-	-		0.260	Nov 2023	0.386	Jan 2025	-		0.386	Continuing	Continuing	-

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206438SF / <i>Space Control Technology</i>	Project (Number/Name) 646438 / <i>Joint Space Integration Technology</i>

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

MASE Integration and Test	
Systems Engineering and Integration	
Application Infrastructure/Online Services	
Developmental/Operational Testing	
MASE Modeling, Simulation and Demonstration	
Modeling and Propagation	
Regional Models	
Sensors and Data	
MASE Software Development	
Major Release 1.3	
Major Release 1.4	
Major Release 1.5	
Major Release 1.6	
Major Release 1.7	
Major Release 1.8	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206438SF / <i>Space Control Technology</i>	Project (Number/Name) 646438 / <i>Joint Space Integration Technology</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>MASE Integration and Test</i>				
Systems Engineering and Integration	1	2023	4	2029
Application Infrastructure/Online Services	1	2023	4	2029
Developmental/Operational Testing	1	2023	4	2029
<i>MASE Modeling, Simulation and Demonstration</i>				
Modeling and Propagation	1	2023	4	2029
Regional Models	1	2023	4	2029
Sensors and Data	1	2023	4	2029
<i>MASE Software Development</i>				
Major Release 1.3	1	2023	4	2024
Major Release 1.4	1	2024	4	2025
Major Release 1.5	1	2025	4	2026
Major Release 1.6	1	2026	4	2027
Major Release 1.7	1	2027	4	2028
Major Release 1.8	1	2028	4	2029

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206458SF / <i>Tech Transition (Space)</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	0.000	164.649	228.547	0.000	228.547	302.399	220.068	156.614	159.704	Continuing	Continuing
649493: <i>Resilient Architecture Design and Evaluation</i>	-	0.000	15.067	60.140	0.000	60.140	82.885	199.575	156.614	159.704	Continuing	Continuing
64S444: <i>Experimentation (Space)</i>	-	0.000	149.582	168.407	0.000	168.407	219.514	20.493	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Tech Transition (Space) Program addresses the gaps between USSF Force Design activities, 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 649493 eases and accelerates the architectural pivots required by the Space Warfighting Analysis Center's future force designs through engagement with commercial and industry partners, prototyping and demonstration, test buys and contracts, warfighter engagement, and the capturing of lessons learned to feed back into Force Design analytics and forward into requirements and acquisition. 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 FY 2029, 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 DoD and commercial paths, including developing a billing approach between vendors, for both space-to-ground and space-to-space connectivity. The knowledge will transition to USSF to inform contract structures for operations that enable switching between DoD systems and multiple vendors at minimum cost. Together, these Projects will directly inform COCOMS, MAJCOMS, Field Commands, 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.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206458SF / <i>Tech Transition (Space)</i>
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In order to manage, execute, and deliver science and technology capabilities, this program element may include: necessary civilian pay expenses; expenses to support the operation and maintenance of facilities; as well as expenses related to travel, supplies, IT hardware, software and support, administrative contractor services, etc.

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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	0.000	164.649	228.147	0.000	228.147
Current President's Budget	0.000	164.649	228.547	0.000	228.547
Total Adjustments	0.000	0.000	0.400	0.000	0.400
• 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	0.400	0.000	0.400

Change Summary Explanation

FY 2025 funding increased compared to FY 2024 by \$63.9M. Funding increased due to initiation of prototype Hybrid SATCOM Terminal integration on first 5 of 9 platforms and planned increase for customization of multi-band apertures to allow use on most challenging platforms as well as hardware costs for the resilient architecture design and evaluation project.

The increase in FY2025 from PB 2024 to PB 2025 of \$0.4M reflects additional funding to address rising costs for hardware and services.

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 4					R-1 Program Element (Number/Name) PE 1206458SF / <i>Tech Transition (Space)</i>				Project (Number/Name) 649493 / <i>Resilient Architecture Design and Evaluation</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
649493: <i>Resilient Architecture Design and Evaluation</i>	-	0.000	15.067	60.140	0.000	60.140	82.885	199.575	156.614	159.704	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 demonstration. The project leverages Hybrid SATCOM terminal prototyping in the Experimentation (Space) project along with direct relationships with commercial terrestrial and space data transport providers to demonstrate dynamic networking, understand commercial offerings, assess security and resiliency, and jump-start future acquisition approaches that enable a pivot to a more resilient architecture.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Resilient Architecture Design and Evaluation	0.000	15.067	60.140
<p>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.</p> <p>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 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.</p> <p>FY 2025 Plans:</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206458SF / <i>Tech Transition (Space)</i>	Project (Number/Name) 649493 / <i>Resilient Architecture Design and Evaluation</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Continue modeling/simulation and operational experimentation activities to advance next-generation resilient network enterprise management and control capabilities, establish scalability to DoD traffic loads, and optimize traffic flow algorithms across the hybrid DoD-commercial SATCOM architecture. Prototype variable trust engine extending DoD zero trust principles across the internetwork to dynamically provide improved availability and security. Construct trusted network device simulators and emulators to support software- and hardware-in-the-loop experimentation with related prototyping and acquisition programs. Construct hybrid SATCOM terminal roaming backplane emulator to pathfind next-generation user hardware. Continue development and test of network service orchestrator to quantify and improve security and resiliency. Begin acquisition of experimental network gateway space vehicle and interoperable optical communications terminals. Conduct milestone experiment characterizing advanced authentication, authorization and trust factors to inform ongoing and future programs of record. Conduct planning for additional early adopter tests and integration with next-generation terrestrial data transport investments.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 funding increased compared to FY 2024 by \$45.073M. Funding increased to support development of trusted network device hardware, procurement of SATCOM hybrid terminal enhancement hardware, and acquisition of a spacecraft bus and related payloads needed for on-orbit experimentation.</p>			
Accomplishments/Planned Programs Subtotals	0.000	15.067	60.140

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206458SF / <i>Tech Transition (Space)</i>	Project (Number/Name) 649493 / <i>Resilient Architecture Design and Evaluation</i>
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Resilient Architecture Design and Evaluation	Various	Various : Various : TBD	-	-		9.033	Oct 2023	-		-		-	Continuing	Continuing	-
Hybrid Space Architecture Contract 2	C/FP	Various: Various : Arlington, VA	-	-		-		2.300	Oct 2024	-		2.300	Continuing	Continuing	-
Commercial Space Data Providers	C/TBD	TBD : TBD	-	-		-		5.200	Dec 2024	-		5.200	Continuing	Continuing	-
C2E Cloud Services	SS/FP	Amazon Web Services, Inc : Seattle, WA	-	-		-		1.500	Jan 2025	-		1.500	Continuing	Continuing	-
Network simulation software	Various	Various : Various	-	-		-		0.850	Jan 2025	-		0.850	Continuing	Continuing	-
Hardware/software-in-the-loop	C/CPAF	MTSI : Alexandria, VA	-	-		-		1.400	Jan 2025	-		1.400	Continuing	Continuing	-
Network Service Orchestrator	TBD	TBD : TBD	-	-		-		3.000	Jan 2025	-		3.000	Continuing	Continuing	-
Hybrid terminal backplane	C/TBD	TBD : TBD	-	-		-		10.000	Jun 2025	-		10.000	Continuing	Continuing	-
Trusted network switch payload	C/TBD	TBD : TBD	-	-		-		5.735	Mar 2025	-		5.735	Continuing	Continuing	-
Space vehicle	C/TBD	TBD : TBD	-	-		-		20.000	Aug 2025	-		20.000	Continuing	Continuing	-
Subtotal			-	-		9.033		49.985		-		49.985	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Resilient Architecture Design	MIPR	FFRDC/Naval Research Lab : TBD	-	-		4.033	Jan 2024	1.000	Nov 2024	-		1.000	Continuing	Continuing	-
Internetworking Test and Evaluation	Various	Various : Various	-	-		-		6.000	Apr 2025	-		6.000	Continuing	Continuing	-
Subtotal			-	-		4.033		7.000		-		7.000	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force												Date: March 2024			
Appropriation/Budget Activity 3620F / 4				R-1 Program Element (Number/Name) PE 1206458SF / <i>Tech Transition (Space)</i>				Project (Number/Name) 649493 / <i>Resilient Architecture Design and Evaluation</i>							
Test and Evaluation (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Administration	Various	Various: TBD : Albuquerque, NM	-	-		2.001		-		-		-	Continuing	Continuing	-
Subtotal			-	-		2.001		-		-		-	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Administration	Various	Various: TBD : Albuquerque, NM	-	-		-		3.155	Oct 2024	-		3.155	Continuing	Continuing	-
Subtotal			-	-		-		3.155		-		3.155	Continuing	Continuing	N/A
Project Cost Totals			-	-		15.067		60.140		-		60.140	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206458SF / <i>Tech Transition (Space)</i>	Project (Number/Name) 649493 / <i>Resilient Architecture Design and Evaluation</i>

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>Experimentation Campaign-Resilient Architecture Design and Evaluation</i>	
Architectural Performance Assessments	[REDACTED]
Architectural Resilience Evaluations	[REDACTED]
Prototype Integration and Test	[REDACTED]
Operational Experimentation	[REDACTED]
Transition to Force Design, PEO, and Ops	[REDACTED]

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206458SF / <i>Tech Transition (Space)</i>	Project (Number/Name) 649493 / <i>Resilient Architecture Design and Evaluation</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Experimentation Campaign-Resilient Architecture Design and Evaluation</i>				
Architectural Performance Assessments	1	2024	4	2027
Architectural Resilience Evaluations	1	2025	4	2027
Prototype Integration and Test	3	2025	3	2028
Operational Experimentation	1	2026	2	2029
Transition to Force Design, PEO, and Ops	1	2025	4	2029

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 4					R-1 Program Element (Number/Name) PE 1206458SF / <i>Tech Transition (Space)</i>				Project (Number/Name) 64S444 / <i>Experimentation (Space)</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
64S444: <i>Experimentation (Space)</i>	-	0.000	149.582	168.407	0.000	168.407	219.514	20.493	0.000	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 FY 2022, this included experimentation for Arctic Communications, leveraging Air Force Research Laboratory (AFRL) Global Lightning efforts. In FY 2024 through FY 2028, 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 2023	FY 2024	FY 2025
Title: Experimentation Space	0.000	149.582	168.407
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 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. Initiate antenna customization for most challenging platforms.			
FY 2025 Plans: Continue development on prototypes for the Hybrid SATCOM Terminals that can be integrated on air and ground platforms and perform the required integration assessments. Continue development of customized antennas needed for most challenging platforms. Complete integration assessments on remaining 4 of 9 platforms. Begin integration of prototypes on initial test platforms.			
FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 funding increased compared to FY 2024 by 18.825 million. Funding increased due to initiation of prototype integration on first 5 of 9 platforms and planned increase for customization of multi-band apertures to allow use on most challenging platforms.			
Accomplishments/Planned Programs Subtotals	0.000	149.582	168.407

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force Date: March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206458SF / <i>Tech Transition (Space)</i>	Project (Number/Name) 64S444 / <i>Experimentation (Space)</i>
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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).

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206458SF / <i>Tech Transition (Space)</i>	Project (Number/Name) 64S444 / <i>Experimentation (Space)</i>
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Congressional Add Arctic Comm terminals	Various	Various : Various	-	-		-		-		-		-	Continuing	Continuing	-
Hybrid SATCOM Terminals Contractor 1	C/CPFF	Northrop Grumman : CA	-	-	50.000	Oct 2023		30.000	Oct 2024	-		30.000	Continuing	Continuing	-
Hybrid SATCOM Terminals Contractor 2	C/CPFF	L3Harris : UT	-	-	41.000	Nov 2023		30.000	Nov 2024	-		30.000	Continuing	Continuing	-
Hybrid SATCOM Terminals Contractor 3	C/CPFF	SES-SD : VA	-	-	15.629	Oct 2023		7.112	Oct 2024	-		7.112	Continuing	Continuing	-
Custom Antennas for Key Platforms	C/CPFF	Not specified. : TBD	-	-	20.000	Apr 2024		45.000	Apr 2025	-		45.000	Continuing	Continuing	-
Platform Integration Assessments	Various	Not specified. : TBD	-	-	15.000	Jan 2024		8.337	Jan 2025	-		8.337	Continuing	Continuing	-
Platform Integration and Experiments	Various	Not specified. : TBD	-	-	-			40.000	Jan 2025	-		40.000	Continuing	Continuing	-
Subtotal			-	-	141.629			160.449		-		160.449	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Hybrid SATCOM Terminals Interoperability Assessments and Tests	Various	Various : Various	-	-		5.000		5.000		-		5.000	Continuing	Continuing	-
Subtotal			-	-	5.000			5.000		-		5.000	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management Administration	Various	Booz Allen Hamilton : Dayton, OH	-	-		2.953		2.958		-		2.958	Continuing	Continuing	-

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206458SF / <i>Tech Transition (Space)</i>	Project (Number/Name) 64S444 / <i>Experimentation (Space)</i>
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FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Experimentation Campaign-Hybrid SATCOM Terminals	
Platform Integration Assessments	
Terminal & Antenna Prototype	
Platform Integration	
Operational Experimentation	
Transition to PEO & Operations	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206458SF / <i>Tech Transition (Space)</i>	Project (Number/Name) 64S444 / <i>Experimentation (Space)</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Experimentation Campaign-Hybrid SATCOM Terminals</i>				
Platform Integration Assessments	1	2024	4	2025
Terminal & Antenna Prototype	1	2024	4	2026
Platform Integration	2	2025	4	2027
Operational Experimentation	1	2026	4	2028
Transition to PEO & Operations	1	2026	4	2028

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206730SF / <i>Space Security and Defense Program</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	69.169	59.784	53.199	0.000	53.199	54.448	55.570	57.539	58.675	Continuing	Continuing
64A025: <i>Space Protection Program</i>	-	69.169	59.784	53.199	0.000	53.199	54.448	55.570	57.539	58.675	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Program Element (PE) 1206730SF, Space Security and Defense Program (SSDP) funds activities executed by the Joint Department of Defense (DoD) and Office of the Director of National Intelligence (ODNI) organization Space Security and Defense Program. The Program and organization were established to function as the center of excellence for options and strategies (materiel, non-materiel, cross-Title, cross-domain) leading to a more resilient National Security Space (NSS) Enterprise. The organization and its activities operate under the authority of the Deputy Secretary of Defense (DEPSECDEF) and Principal Deputy Director of National Intelligence (PDDNI). SSDP's unique position with both the DoD and ODNI, authorities from both the DEPSECDEF and PDDNI, and broad NSS-scoped mission-set provides a crucial and objective protection competency to advance the highest priority efforts to deliver economical, programmatically-executable, and operationally-relevant space protection solutions for the Nation.

SSDP-funded activities support NSS stakeholders including the DoD, Intelligence Community (IC), civil, commercial, and international space entities/missions supporting current and future national security operations in both peacetime and throughout all phases of conflict. In this capacity, SSDP employs these funds to lead and collaborate on NSS susceptibility and vulnerability assessments, and threat mitigation processes. Its breadth of activities span the capability to conduct rigorous foundational analyses in order to understand red counterspace threat and blue operations environments, and to plan and execute projects to discover, analyze, and validate near-term and far-term options to detect, track, and mitigate and/or render these threats (including emerging space and transmedium threats) ineffective. SSDP analytic products to mitigate/defeat adversary counterspace threats either manifest themselves in validated materiel solution recommendations to corporate decision processes (including system and/or architectural requirements and potential investment opportunities), or as non-materiel recommendations such as Tactics, Techniques, and Procedures (TTP), Concepts of Operations (CONOPS), and/or space policy, or a combination of both. Regardless, SSDP threat analyses and models of all sorts are shared across the NSS enterprise to ensure efficiency and speed of analysis, and ultimately produce results in more resilient space effects for national security missions.

This program element may include necessary emergent or unanticipated civilian pay expenses required to manage and execute SSDP and/or deliver products for emergent or unanticipated weapon system capabilities.

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.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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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 1206730SF / Space Security and Defense Program
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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	69.169	59.784	51.360	0.000	51.360
Current President's Budget	69.169	59.784	53.199	0.000	53.199
Total Adjustments	0.000	0.000	1.839	0.000	1.839
• 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	1.839	0.000	1.839

Change Summary Explanation

FY 2025: Increase due to wargaming and model-based systems engineering project delivery.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
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Title: Space Protection and Survivability	69.169	59.784	53.199
Description: SSDP applies a holistic analytical approach to improve the resilience of NSS space effects for national security missions.			
FY 2024 Plans: In FY 2024 SSDP activities remain focused on identifying and answering NSS stakeholder priorities across three still-relevant objective areas; Survivability and Defense, Offensive Space Control, and Preparing for the Future Fight. As with prior years, the program's holistic approach to these analyses and resulting recommendations demanded threat knowledge, Space Domain Awareness and Fire Control, costing, policy, and wargaming analyses to the appropriate extent and practicality.			
NSS stakeholders will continue to benefit from SSDP-benchmarked digital engineering products (including MBSE) for both space protection analyses and threat definition documentation. Recognizing the demand for SSDP analyses, the program will continue to invest in knowledge management infrastructure to make analyses more readily available and will continue to invest in developing and sustaining analytic capabilities to support its NSS Enterprise stakeholders.			
In addition to ongoing and new Space Control, EW, and Future Technology investment recommendations, FY 2024 will deliver initial digital engineering capabilities to the United States Space Force (USSF) including a Model Library with available blue systems and red threat models with complementary designs for the Analysis Environment and Government-Owned MBSE-			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206730SF / <i>Space Security and Defense Program</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>compliant Simulation Engines. These deliverables were intended to be used for not only USSF Force Design and Wargaming activities, but also the test, training, and doctrine communities.</p> <p>FY 2025 Plans: Fiscal Year 2025 will see continued organizational change, growth, and challenges within the United States Space Force (USSF) and across the National Security Space (NSS) community. As an integral part of the community, the Space Security and Defense Program (SSDP) will adapt to the inevitable changes and continue to provide our stakeholders with creative, informed, and rigorously evaluated solutions for space superiority.</p> <p>SSDP's analytical priorities for FY25 focus on the following: Ensuring Resilience of Near-term and Future Space and Space-enabled Missions, Offensive Space Control (OSC) Force Design, Enhancing Space Control Weapon Effectiveness, and Space and the Cross Domain Fight. As part of Ensuring Resilience of Near-term and Future Space and Space-enabled Missions, SSDP will continue to focus on the resiliency of next-generation space missions and support to our stakeholders' development of Government Reference Architectures. Keeping pace with and getting ahead of adversary advances is a critical component of our Offensive Space Control Force Design analysis. Specifying Space Force Design (offense and defense) is only the start of our SSDP responsibilities. The program will also be focused on Enhancing Space Control Weapon Effectiveness; requiring SSDP to collaborate with our stakeholders to ensure system readiness and effectivity. Finally, understanding the impact of space to the cross-domain fight for both the US and our adversaries is an increasingly important aspect of SSDP's Space and the Cross-Domain Fight responsibilities.</p> <p>In the spirit of our charter, we will address these priorities through materiel and non-materiel solutions, kinetic and non-kinetic options, cross-domain solutions, and policy, doctrine and strategic messaging analyses to support safe, sustainable, and flexible on-orbit operations, and deter adversaries from engaging in space conflict.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 funding decreased due to completion of wargaming and model-based systems engineering project delivery in FY 2024.</p>			
Accomplishments/Planned Programs Subtotals	69.169	59.784	53.199

D. Other Program Funding Summary (\$ in Millions) N/A	
Remarks N/A	

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206730SF / <i>Space Security and Defense Program</i>	

E. Acquisition Strategy

All contracts funded in this program element will be awarded using competitive procedures to the maximum extent possible. The program consists of numerous efforts/projects.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force												Date: March 2024			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
3620F / 4				PE 1206730SF / Space Security and Defense Program				64A025 / Space Protection Program							
Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Space Protection and Survivability	Various	Various : TBD	-	62.524	Jan 2023	52.822	Oct 2023	46.349	Oct 2024	-		46.349	Continuing	Continuing	-
Subtotal			-	62.524		52.822		46.349		-		46.349	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Support and Infrastructure	Various	Various : TBD	-	2.326	Nov 2022	2.493	Oct 2023	2.503	Oct 2024	-		2.503	Continuing	Continuing	-
Oversight, Advisory and other Technical Support	Various	Various : TBD	-	4.319	Nov 2022	4.469	Oct 2023	4.347	Oct 2024	-		4.347	Continuing	Continuing	-
Subtotal			-	6.645		6.962		6.850		-		6.850	Continuing	Continuing	N/A
			Prior Years	FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	69.169		59.784		53.199		-		53.199	Continuing	Continuing	N/A
Remarks															
N/A															

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206730SF / <i>Space Security and Defense Program</i>	Project (Number/Name) 64A025 / <i>Space Protection Program</i>

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>Space Security and Defense Program</i>	
Non-Traditional Effects - Multi-Domain Effects	
Non-Traditional Effects - Electronic Warfare	
Space Control	
Space Control - Space Domain Awareness	
Space Control - Future Technologies	
Wargaming	
Intelligence and Policy - Threat Assessment	
Intelligence and Policy- Policy Assessment	
Wargaming M&S Sustainment	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206730SF / <i>Space Security and Defense Program</i>	Project (Number/Name) 64A025 / <i>Space Protection Program</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Space Security and Defense Program</i>				
Non-Traditional Effects - Multi-Domain Effects	1	2023	4	2029
Non-Traditional Effects - Electronic Warfare	1	2023	4	2029
Space Control	1	2023	4	2029
Space Control - Space Domain Awareness	1	2023	4	2029
Space Control - Future Technologies	1	2023	4	2029
Wargaming	1	2023	4	2024
Intelligence and Policy - Threat Assessment	1	2023	4	2029
Intelligence and Policy- Policy Assessment	1	2023	4	2029
Wargaming M&S Sustainment	1	2025	4	2029

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 1206760SF I Protected Tactical Enterprise Service (PTES)
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	106.895	76.554	79.709	0.000	79.709	38.592	36.245	87.712	89.442	0.000	515.149
643726: PTES	-	106.895	45.917	24.303	0.000	24.303	13.383	5.961	6.879	7.015	0.000	210.353
643733: PTW Over Commercial	-	0.000	30.637	55.406	0.000	55.406	25.209	30.284	80.833	82.427	0.000	304.796

A. Mission Description and Budget Item Justification

Project 643726, Protected Tactical Enterprise Service (PTES) enables multi-domain operations for tactical warfighters in congested and contested environments using military satellites in various orbits. Project 643733, Protected Tactical Waveform (PTW) Over Commercial, develops an anti-jam (AJ) communications capability using the protected tactical waveform over commercial satellite constellations to support tactical users in joint and allied warfighting operations.

The global threat of electronic warfare attacks against space systems will expand in the coming years in both number and types of weapons. Threat development will very likely focus on jamming capabilities against dedicated military satellite communications (MILSATCOM). To address this critical threat, and in pursuit of more precise solutions for disaggregated strategic and tactical SATCOM, U.S Strategic Command (USSTRATCOM) and Air Force Space Command (AFSPC) initiated the Protected Anti-jam Tactical SATCOM (PATS) family-of-systems incremental approach, including PTES and Protected Tactical SATCOM (PTS), to mitigate adversarial jamming effects by using the PTW. The United States Space Force (USSF) is developing PTES to establish the foundational ground system that will enable PTW-based protected communications of PATS. PTES is a software intensive program needed to achieve the PATS architecture by developing the critical ground infrastructure to operationalize the PTW via military and commercial satellite systems for tactical users in all Services. As part of the PATS integrated, incremental approach, PTES ground system development will initially enable PTW over the Wideband Global Satellite Communications (WGS) system to provide an operational AJ communications capability. PTES will extend PATS development to provide PTW service using commercial satellites in various orbits and purpose-built PTS system with onboard PTW processing. The ability to securely access both military and commercial capabilities in multiple orbits will provide tactical warfighters alternate protected SATCOM paths for greater network resiliency.

The PTES program is developing a Mission Management System (MMS), a Key Management System (KMS), and Joint Hub Variants (JHVs) to enable PTW via transponded WGS satellites, and to commercial SATCOM with JHVs. The systems will be extensible to support commercial and military SATCOM systems in the future. The user equipment will consist of existing wideband terminals with upgraded PTW modems. Production-representative PTW modems for user terminals were developed by the Protected Tactical Service Field Demonstration (PTSFD) and will be separately acquired by each Service and Allied international partner. The Navy Wideband Anti-Jam Modem System (WAMS), the Air Force-Army Anti-Jam Modem (A3M), and other stakeholders rely on PTES to provide PTW ground infrastructure. A3M provides the Air Force and Army with a secure, wideband, AJ SATCOM terminal modem for tactical SATCOM operations. The WAMS modem is the Navy's next generation software-defined wideband modem for both transponded and processed satellite. The user terminal segment, not included in this acquisition, utilizing low-cost PTW modem upgrades enabled by the A3M and WAMS programs are designed to become an integral part of the growing PATS enterprise.

The PTES Prototype Development was designated as a Rapid Prototype (RP) in June 2018 from the National Defense Authorization Act (NDAA) for Fiscal Year 2016 (Public Law 114-92) under Middle Tier of Acquisitions (MTA) for Rapid Prototyping/Rapid Fielding (Section 804) to operationalize the PTW initially with WGS and has

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206760SF / <i>Protected Tactical Enterprise Service (PTES)</i>
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been approved to transition into a Software Acquisition pathway. A new Project, 643733 PTW Over Commercial, was created in this Program Element in FY 2024 to segregate funding allocated to develop the capability to deliver PTW to the warfighter by leveraging commercial communication satellites. This continues efforts begun in FY 2023 under Project 643726, PTES Prototype Development. To meet the warfighter requirements for protected tactical MILSATCOM and the capability gaps identified in these studies, RDT&E funding is required for architectural development, acquisition strategy development, system requirements and system trades analysis, and engineering, manufacturing, developing, testing and evaluating PTES and PATS systems and segments.

For the PATS WGS capability, the PTES system addresses an operational need in the Pacific region by achieving Initial Operational Capability (IOC) in FY 2025. IOC provides ground elements for PTW over WGS and consists of PTES JH installations at two WGS DoD SATCOM Teleport sites utilizing one WGS satellite. At Full Operational Capability (FOC) in FY 2026, PTES will provide worldwide PTW operations using up to all WGS satellites. For the PTW Over Commercial, the PTES system will achieve IOC providing resilient commercial capacity and path diversity across ground elements for PTW over commercial architectures in CY 2026. The PTES team will execute additional studies and proof of concept demonstrations to inform commercial requirements and MMS, KMS development. PTES will reach FOC in CY 2026 providing robust PTW operations using commercial satellites in various orbits.

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

This 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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	110.801	76.554	88.871	0.000	88.871
Current President's Budget	106.895	76.554	79.709	0.000	79.709
Total Adjustments	-3.906	0.000	-9.162	0.000	-9.162
• 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	-3.906	0.000			
• Other Adjustments	0.000	0.000	-9.162	0.000	-9.162

Change Summary Explanation

FY 2025: The FY 2025 funding request was reduced by -\$9.3 million to account for the availability of prior year execution balances.

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206760SF / <i>Protected Tactical Enterprise Service (PTES)</i>	Project (Number/Name) 643726 / PTES
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
643726: PTES	-	106.895	45.917	24.303	0.000	24.303	13.383	5.961	6.879	7.015	0.000	210.353
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

PTES will deliver a software-intensive ground system to provide worldwide, AJ protected communications to warfighters who are currently unable to operate through interference by using the PTW. PTES delivers the foundational ground system to enable PTW-based protected communications for all PATS capabilities in a incremental approach by operationalizing the PTW over WGS and later for PTW Over Commercial and the future PTS system. In this Project, the PTES ground system will provide an operational AJ communications capability using PTW service over the existing WGS system. This effort also includes the development of PTES program elements such as the MMS, a KMS, and JHs, which will be extensible to PTW via transponded commercial satellites. This effort informs, supports, and reduces risk to future PATS development that will provide the PTW service using commercial satellites and purpose-built PTS with onboard PTW processing. The development for PTW over WGS in this Project, 643726, segregates efforts established in FY 2024 as a new Project, 643733, for the PTW Over Commercial increment of PTES. This new Project continues FY 2023 efforts begun in Project 643726 for the next instantiation of the PATS architecture to enable PTW service through commercial satellites with processing that will occur on the ground.

PTES will develop the MMS and KMS software, and the JH hardware. A JH is the unmanned computing and communications hardware located at a SATCOM Gateway which will provide the PTW signal processing, reachback network connectivity, and near-real-time networked control to direct the connected terminals. The JHs will require installation at large SATCOM Gateways and the system will be integrated and tested with PTW-capable modems that will be separately procured by the Navy, Air Force, and Army. In addition, the KMS and JH End Cryptographic Units (ECU) must be certified by the National Security Administration (NSA). The ECUs are required to generate transmission security (TRANSEC) and cover for all channels/data flows, encrypt/decrypt waveform messages, securely receive/store key material from NSA's Key Management Infrastructure, as well as to synchronize and process key streams for hundreds of simultaneous users.

Driven by emerging threats in the Pacific theater, PTES completed the MTA rapid prototyping effort in FY 2023 by operationally demonstrating an anti-jam tactical communications capability using user-provided terminals. On 31 May 2023, the PTES Program Office successfully transitioned the program from an MTA into the Execution Phase of the Software Acquisition Pathway. PTES plans to reach Initial Operating Capability (IOC) to be demonstrated over WGS satellites in FY 2025 and Final Operating Capability (FOC) to be demonstrated in FY 2026 for worldwide PTW operations using up to all WGS satellites.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: PTES Prototype Ground and Software Development	106.895	31.370	6.889
Description: This Major Thrust, previously titled "PTES Prototype Development", has been segregated into another Major Thrust and new Project in FY 2024 to differentiate efforts between the PTES development contractor and the PTW Over Commercial effort. Develop and field the ground system for enabling capabilities of adaptive, AJ, wideband SATCOM under the PATS effort. Utilize Agile software development to deliver a system consisting of three PTES segments: MMS, KMS and JHs, to include ECUs,			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206760SF / <i>Protected Tactical Enterprise Service (PTES)</i>	Project (Number/Name) 643726 / <i>PTES</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>integrated into existing SATCOM Gateways to enable the PTW AJ communications capability via transponded WGS satellites for tactical users currently unable to operate through interference. Support the build, test, and installation of hardware required to prototype a tactical, AJ communications capability demonstrated in an operationally relevant environment and to operate the system at IOC and FOC. Efforts include performing and assisting the PTES team in system integration and conducting contractor-led factory tests, including risk reduction and end-to-end tests of the complete PTES prototype.</p> <p>FY 2024 Plans: Continues agile process prototyping, including automation for global coverage, new theaters, and PTS integration for FY 2024. Achieve IOC in an operational environment that builds upon the operational demonstration in FY 2023 (MTA completion). Complete the development of Software Build 6 and commence Software Build 7 focused on continuously delivering increased cloud-hosted MMS and KMS functionality needed for FOC. Continuously test deployed software before being promoted to operations. Perform additional testing and integration activities with other PTW-capable modems necessary to expand PTW capability to other services and user groups. Rapidly respond to implement system resiliency and situational awareness as necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p>FY 2025 Plans: Continues agile development process, including expansion towards global coverage, new theaters, and PTS integration for FY 2025. Complete the development of Software Build 7 and commence Software Build 8 focused on finalizing capability delivery and deficiency fixes necessary for FOC. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to completion of initial PTW operational capability deliveries and achieving IOC.</p>				
Title: PTES System Development Baseline, Integration, and Test		0.000	14.547	17.414
Description: Integrates all PTES segments, including executing government-led end-to end tests of the complete PTES system until FOC. Includes Development Test/Operational Test (DT/OT), conducted by the 45th Test Squadron (TS) and STAR Delta 12 / 4th Test and Evaluation Squadron. Management of the PTES technical baseline through acquiring, designing, testing, and integrating key system segments as well as external interfaces as part of the larger SATCOM enterprise. Supports the				

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206760SF / <i>Protected Tactical Enterprise Service (PTES)</i>	Project (Number/Name) 643726 / PTES

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Joint Satellite Engineering Center (JSEC) and Joint Interoperability Command (JITC) to ensure risk-reduction is demonstrated, system interfaces are validated, and data needed to support cybersecurity system authorization and interoperability certifications will be obtained. Manage system capability development hand-in-hand with operator involvement to provide information for technical, integration, and programmatic decisions. Includes additional studies and proof of concept demonstrations to inform commercial requirements, build out needed improvements to the MMS, and establish needed interoperability with commercial systems required to support Joint Force needs. Tobyhanna Army Depot will be responsible for key loading and initialization of PTW capable modems.</p> <p>FY 2024 Plans: Conduct Government prioritized software development, software build testing and integration activities for IOC and FOC fielding. Lead DT/OT evaluation for PTES hardware and software ground elements enabling FOC for PTW over WGS and to inform evaluations extending to PTW over commercial architectures. Witness PTES contractor-led factory tests focusing on PTES specification requirements. Support cyber efforts, such as those required to obtain Interim Approval to Test (IATT) and Approvals to Operate (ATO), software qualification testing, regression testing, capability demonstrations, and risk reduction tests. Build-out and support cloud-hosted software on a Government approved Core Data Center that leverages existing secure resources. Complete DT/OT test events for IOC build and begin DT/OT test events for FOC build. Support pre-operational checkout phase.</p> <p>FY 2025 Plans: Complete DT/OT for IOC deficiency fix testing and execute DT/OT events for FOC build. Lead DT/OT evaluation for Government prioritized hardware and software ground element deployment enabling FOC for PTW over WGS and to inform evaluations extending to PTW over commercial architectures. Perform additional testing and integration activities with other PTW-capable modems necessary to expand PTW capability to other services and user groups. Witness PTES contractor-led factory tests focusing on PTES specification requirements. Support continuous cybersecurity assessments, such as those required to maintain Approvals to Operate (ATO), software qualification testing, regression testing, capability demonstrations, and risk reduction tests.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased due to evolving ground and software development required for full FOC capabilities as well as onboarding additional PTW-capable modems into the PTW architecture.</p>			
Accomplishments/Planned Programs Subtotals	106.895	45.917	24.303

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
• SPSF 01 BA01 PTES00: <i>PTES HUB</i>	42.464	56.482	56.148	-	56.148	11.866	0.000	0.000	0.000	0.000	166.960

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206760SF / <i>Protected Tactical Enterprise Service (PTES)</i>	Project (Number/Name) 643726 / PTES
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u> <u>Base</u>	<u>FY 2025</u> <u>OCO</u>	<u>FY 2025</u> <u>Total</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>FY 2029</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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Remarks

D. Acquisition Strategy

USSF is developing PATS in an evolutionary manner to introduce PTW capabilities providing anti-jam (AJ) communications via military and commercial satellite systems for tactical users in all Services, initially providing service over the existing military WGS satellite system and then adding commercial and purpose-built AJ PTS satellites. The PTES Prototype Development was designated as a RP in June 2018 from the NDAA for Fiscal Year 2016 (Public Law 114-92) under MTA for Rapid Prototyping/ Rapid Fielding (Section 804) to kick off the design, development, integration and testing with PTW service via WGS. The PTES program competitively awarded a single Cost-Plus Incentive Fee (CPIF) contract to Boeing on 26 November 2018 to develop and field the PTES, through declaration of FOC planned for FY 2026. The MTA-RP effort consisted of the initial deployment of the PTES ground system supporting the PATS WGS Phase with PTW leveraging codified MTA authorities and agile software development practices to rapidly field an operational leave-behind AJ capability via WGS using PTW ahead of IOC. Boeing and sub-contractors will be responsible for developing all PTES segments (MMS, KMS, and JHVs) and performing all system integration, including end-to-end tests of the complete PTES prototype. Raytheon is the major sub-contractor to develop the ECUs. The program office will secure Cloud and Infrastructure services from approved and secure Government sources. Tobyhanna Army Depot will be responsible for key loading and initialization of PTW capable modems. The 45th TS (PTES DT), STAR Delta 12 / 4th Test and Evaluation Squadron (PTES OT), JSEC, and JITC support test events. On 31 May 2023, the PTES Program Office successfully transitioned the program from an MTA into the Execution Phase of the Software Acquisition Pathway that will enable the delivery towards providing a worldwide PTW capability through FOC.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206760SF / <i>Protected Tactical Enterprise Service (PTES)</i>	Project (Number/Name) 643726 / PTES
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PTES Prototype Ground and Software Development	C/CIPIF	Boeing : El Segundo, CA	-	93.414	Oct 2022	31.370	Oct 2023	6.889	Oct 2024	-		6.889	0.000	131.673	-
PTES System Development Baseline, Integration and Test	Various	Various : Various	-	-		3.085	Nov 2023	3.008	Nov 2024	-		3.008	0.000	6.093	-
Tobyhanna Army Depot	MIPR	Tobyhanna Army Depot : Tobyhanna, PA	-	-		1.145	Mar 2024	0.000	Mar 2025	-		0.000	0.000	1.145	-
Technical Mission Analysis	RO	Aerospace : El Segundo, CA	-	0.000	Jan 2023	2.250	Jan 2024	3.120	Jan 2025	-		3.120	0.000	5.370	-
Enterprise SE&I	Various	Various : Various	-	8.202	Nov 2022	2.833	Nov 2023	6.301	Nov 2024	-		6.301	0.000	17.336	-
SBIR/STTR	Allot	Not specified. : TBD	-	-		1.607		1.208		-		1.208	0.000	2.815	-
Subtotal			-	101.616		42.290		20.526		-		20.526	0.000	164.432	N/A

Test and Evaluation (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test Planning & Execution DT/OT	Various	Various : Various	-	3.450	Nov 2022	1.810	Nov 2023	2.480	Nov 2024	-		2.480	0.000	7.740	-
Subtotal			-	3.450		1.810		2.480		-		2.480	0.000	7.740	N/A

Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
FFRDC	RO	Aerospace : El Segundo, CA	-	0.000	Jan 2023	0.120	Jan 2024	0.130	Jan 2025	-		0.130	0.000	0.250	-
A&AS	Various	Various : Various	-	1.559	Jan 2023	1.607	Jan 2024	1.107	Jan 2025	-		1.107	0.000	4.273	-
Other Support	Various	Various : Various	-	0.270	Oct 2022	0.090	Oct 2023	0.060	Oct 2024	-		0.060	0.000	0.420	-
Subtotal			-	1.829		1.817		1.297		-		1.297	0.000	4.943	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force							Date: March 2024				
Appropriation/Budget Activity 3620F / 4			R-1 Program Element (Number/Name) PE 1206760SF / <i>Protected Tactical Enterprise Service (PTES)</i>				Project (Number/Name) 643726 / <i>PTES</i>				
	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals	-	106.895	45.917	24.303	-	24.303	0.000	177.115	N/A		

Remarks
 PTW Over Commercial transferred to Project 643733 in FY 2024 to segregate funding allocated to develop the capability to deliver PTW to the warfighter by leveraging commercial satellites. Tobyhanna Army is an effort included in the PTES System Development Baseline, Integration & Test Support Major Thrust, and will be responsible for key loading and initialization of PTW capable modems.

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206760SF / <i>Protected Tactical Enterprise Service (PTES)</i>	Project (Number/Name) 643726 / <i>PTES</i>

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>PTES Prototype Ground Development</i>	
PTES Agile Process Prototype Development	
Operational Demonstration (IOC Threshold Capability)	
Initial Operational Capability (IOC)	
Full Operational Capability (FOC)	
<i>PTES Prototype Software Development</i>	
Risk Reduction Test 6	
Risk Reduction Test 7	
<i>PTES System Development Baseline/Integration/Test</i>	
Hardware Development Build/Test/Installation IOC/FOC Support	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206760SF / <i>Protected Tactical Enterprise Service (PTES)</i>	Project (Number/Name) 643726 / <i>PTES</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>PTES Prototype Ground Development</i>				
PTES Agile Process Prototype Development	1	2023	2	2026
Operational Demonstration (IOC Threshold Capability)	2	2023	2	2023
Initial Operational Capability (IOC)	2	2025	2	2025
Full Operational Capability (FOC)	3	2026	3	2026
<i>PTES Prototype Software Development</i>				
Risk Reduction Test 6	2	2024	4	2024
Risk Reduction Test 7	2	2024	4	2024
<i>PTES System Development Baseline/Integration/Test</i>				
Hardware Development Build/Test/Installation IOC/FOC Support	1	2023	1	2026

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 4					R-1 Program Element (Number/Name) PE 1206760SF / <i>Protected Tactical Enterprise Service (PTES)</i>				Project (Number/Name) 643733 / <i>PTW Over Commercial</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
643733: <i>PTW Over Commercial</i>	-	0.000	30.637	55.406	0.000	55.406	25.209	30.284	80.833	82.427	0.000	304.796
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 643733, PTW Over Commercial, will deliver PTW to the warfighter in various orbits utilizing commercial (to include international) SATCOM constellations enabling more resilient by design architectures. This was not a FY 2024 New Start. It is a continuation of efforts that began in the PTES Project 643726 in FY 2023 to build upon efforts to operationalize PTW over WGS. This Project reflects the next instantiation of the PATS architecture's integrated, incremental approach to enable PTW service through commercial satellites with processing that will occur on the ground. This Project will expand the development of PTES program elements to include requirement, architecture, and interface development to leverage PTES MMS/KMS systems and JHVs to enable PTW via transponded commercial satellites.

The objective of PTW Over Commercial is to upgrade the established PTES ground system to provide an operational AJ capability in various orbits including Geosynchronous Orbit (GEO) and Medium Earth Orbit (MEO) by utilizing emerging satellite technologies. Leverages PTES development to design, build, integrate, and test an AJ communications capability for a PTW utility over commercial SATCOM constellations to support filling critical tactical SATCOM gaps and improve overall theater warfighting SATCOM flexibility and resiliency. To do this, this Project will also leverage and build on emerging commercial satellite technologies through assessment, experimentation, and development efforts. The PTW Over Commercial effort will execute studies, proof of concept demonstrations, and tests to inform commercial requirements, build out needed improvements to the PTES ground system, and establish needed interoperability with commercial and international systems required to support Joint Force needs.

Collective and complimentary efforts will work to solve complex problems of interoperability, key management, and data sharing that drive the affordability, scalability and performance of USSF's future hybrid architecture.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: PTW Over Commercial - Studies/Demonstrations	-	3.250	0.000
Description: Assess emerging commercial SATCOM technologies in multiple orbits for tactical applications and PTES integration. Execute additional studies and proof of concept demonstrations to inform commercial requirements and MMS, KMS development for PTES integration with commercial GEO and MEO SATCOM technologies. Conduct tests and demonstrations, to prepare and reduce risk for the PTW Over Commercial effort. Analyze, integrate, and test PTES system with small satellites (small sats) to evaluate the PTES architecture for GEO small sat applications. Perform a risk reduction study to evaluate PTW applications over the mPower constellation in MEO and demonstrate integration of PTES system with mPower satellites using the PTW. Perform a study to refine requirements for the JHV to understand the specific upgrades needed to implement PTW over commercial satellites using PTES JHVs in GEO and MEO constellations.			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206760SF / <i>Protected Tactical Enterprise Service (PTES)</i>	Project (Number/Name) 643733 / <i>PTW Over Commercial</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
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FY 2024 Plans:
Continues FY 2023 efforts that began in the PTES Prototype Development, Project 643726. Execute and complete three studies/demonstrations awarded in FY 2023 for: Integrating/Testing the PTES system with small sats to define tasks to integrate, test, and demonstrate emerging GEO communications small sats for protected tactical SATCOM applications; demonstrating MEO capabilities with a live PTW demonstration with initial mPower satellites without data loss, and service management concepts to burn down technical risks for PTW over mPower; and analyzing requirements for software upgrades, and potential Hardware upgrades required to implement PTW over commercial satellites in MEO and GEO.

FY 2025 Plans:
N/A

FY 2024 to FY 2025 Increase/Decrease Statement:
FY 2025 decreased to zero due to this effort being fully funded in FY23.

Title: PTW Over Commercial - mPower	-	10.000	10.000
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Description: Continue obligation of funds to acquire one mPower Gateway (GW) by awarding a Task Order under NATO Support and Procurement Agency (NSPA) Indefinite Delivery, Indefinite Quantity (IDIQ) contract expected to be awarded in 2Q FY 2024. Release Boeing JHV upgrade contract RFP to enable PTES JHs to operate over MEO and GEO commercial satellite constellations by FY 2027. Continue and complete remaining three site surveys. Start site preparation for the first of the six sites to enable installation and testing of the first GW.

FY 2024 Plans:
Continues efforts that began in the PTES Prototype Development, Project 643726. Develop PTES system firmware/software changes to enable operations over MEO constellation of mPower commercial satellites. Procure mPower terminal systems to support one GEP site installation in FY 2024, including install for the terminal systems. Support site preparation for hardware delivery and installation and test/checkout activities for site acceptance, including demonstrating anti-jam communications through the hybrid SATCOM architecture. Support current DoD O3b Enterprise users, migrate that service to mPower. Coordinate with industry, FFRDC, and IPs to execute studies, proof-of-concept demonstrations, and prototype development, that will result in delivery of an operational capability. Activities include, but are not limited to, requirement definition studies, capability demonstrations, testbed integration and end-to-end testing.

FY 2025 Plans:
Continue obligation of funds to acquire two mPower Gateways (GWs) under previously awarded NATO Support and Procurement Agency (NSPA) Indefinite Delivery, Indefinite Quantity (IDIQ) Task Orders. Award Boeing JHV upgrade contract to enable PTES

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206760SF / <i>Protected Tactical Enterprise Service (PTES)</i>	Project (Number/Name) 643733 / <i>PTW Over Commercial</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>JHs to operate over MEO and GEO commercial satellite constellations by FY27. Continue and complete remaining three site surveys. Start site preparation for the first of the six sites to enable installation and testing of the first GW.</p> <p>Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased due to mPower terminal system procurement and installation at one DoD SATCOM GW site, to include test/checkout activities for site acceptance.</p>				
<p>Title: PTW Over Commercial - PTES Upgrades</p> <p>Description: Build upon PTES system development, which will enable the PTW and provide AJ communications capability over Commercial constellations for tactical users in all Services and IPs. Procure and install additional PTES JHV at DoD SATCOM GEP and apply software changes to MMS to support PTW over Commercial in various orbits. Utilize other established elements of the PTES ground system and leverage ongoing development to design, build, integrate, and test end-to-end system capabilities. Includes requirement, architecture and interface development to leverage, modify and enhance PTES MMS and JHVs system elements to plan and operate over a variety of terminals.</p> <p>FY 2024 Plans: Continues efforts that began in the PTES Prototype Development Project 643726. Continue development to transition from a prototype capability towards providing a PTW capability through IOC and FOC, to include development of mission planning functionality over commercial GEO and MEO constellations. Develop PTES JHV and make the necessary MMS software changes to support PTW over commercial in various orbits based upon comprehensive study results. Finalize characterization of Doppler impacts to PTW for full implementation into PTES system in MEO constellations. Demonstrate production software and integrate into PTES baseline system. Conduct analysis and perform integration and compatibility testing with terminals capable of handling GEO and MEO constellations. Coordinate with industry, FFRDC, and IPs to execute prototype development, that will result in delivery of an operational capability. Activities include, but are not limited to, software upgrades, capability demonstrations, testbed integration, prototype development, and end-to-end testing.</p> <p>FY 2025 Plans: Continue development, integration and testing to deploy PTW capability necessary for IOC and FOC, to include development of mission planning functionality over commercial GEO and MEO constellations. Build, deliver and install PTES JHVs and make the necessary MMS software configuration updates to support PTW over commercial in various orbits based upon comprehensive study results. Demonstrate final production software and integrate into PTES baseline system. Conduct analysis and perform</p>		-	17.387	45.406

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206760SF / <i>Protected Tactical Enterprise Service (PTES)</i>	Project (Number/Name) 643733 / <i>PTW Over Commercial</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>integration and compatibility testing with terminals capable of handling GEO and MEO constellations. Coordinate with industry, FFRDC, and IPs to guide additional commercial development, that will result in delivery of an operational capability. Activities include, but are not limited to, software upgrades, capability demonstrations, testbed integration, prototype development, and end-to-end testing.</p> <p>Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased due to purchase of PTES hardware, to be installed at DoD gateway sites, as well as implementing software upgrades supporting USSF priority to improve theater SATCOM resiliency for the warfighter.</p>			
Accomplishments/Planned Programs Subtotals	-	30.637	55.406

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
• SPSF 01 PTES00: <i>PTES HUB</i>	42.464	56.482	56.148	-	56.148	11.866	0.000	0.000	0.000	0.000	166.960

Remarks

D. Acquisition Strategy

The PTW Over Commercial acquisition strategy strives to provide SATCOM enterprise resiliency enhancements by efficiently using existing designs with reduced nonrecurring engineering by leveraging, where possible, existing contracts and government relationships, to include but not limited to the USSF, US Army, Air Force Research Laboratory (AFRL), Space Warfighting Analysis Center (SWAC), USSF Commercial Satellite Communications Office (CSCO), and the Defense Information Systems Agency (DISA). PTES plans to coordinate with industry, FFRDC, and IPs to execute studies/demonstrations that will inform delivering an operational capability in this Commercial instantiation of PATS. A Firm Fixed Price (FFP) contract was awarded to Astranis on 27 September 2023 to evaluate PTW SATCOM applications for GEO small sats within the PTES architecture. To inform and develop PTW capability in MEO, PTES plans for Massachusetts Institute of Technology/Lincoln Labs (MIT/LL) to conduct a demonstration of PTW implemented over initial mPower commercial MEO satellites, the first allied hybrid government/commercial SATCOM solution. For the acquisition/integration of PTES with the mPower constellation, PTES will procure mPower gateways via CSCO's contract with NSPA, which funds mPower bandwidth capacity in the COMSATCOM PE 1206445SF, Project 650140. The Commercial PTW-PTES acquisition approach plans to leverage the PTES RP MTA acquisition strategy and existing CPIF development contract vehicle with Boeing to award a study to analyze PTW over commercial hardware and software requirements for MEO/GEO constellations and to modify JHVs. A Boeing contract modification will also be awarded to develop the Commercial PTW capability by upgrading existing software that was developed under the PTES RP MTA to enable AJ communications capability over commercial constellations in various orbits. This effort supports the acquisition of gateways by upgrading the PTES system to integrate JHV with mPower terminals. The PTW Over Commercial acquisition will be executed in multiple

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206760SF / <i>Protected Tactical Enterprise Service (PTES)</i>	Project (Number/Name) 643733 / <i>PTW Over Commercial</i>

thrusts to accommodate different constellations and providers. In the mPower thrust, PTW Over Commercial program management office (PMO) will acquire six mPower GWs to support PTW services over mPower MEO constellation. Post acquisition, the thrust will be transitioned to operation and maintenance (O&M). In the PTES Upgrades thrust, PTW services will be provided over GEO constellations; providers for this thrust are TBD.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206760SF / <i>Protected Tactical Enterprise Service (PTES)</i>	Project (Number/Name) 643733 / <i>PTW Over Commercial</i>
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PTW Over Commercial - Studies/Demos (Small Sats)	SS/FFP	Astranis : San Francisco, CA	-	-	1.990	Oct 2023	-	-	-	-	-	-	0.000	1.990	-
PTW Over Commercial - Studies/Demos (MEO)	TBD	MIT/LL : Boston, MA	-	-	1.200	Oct 2023	-	-	-	-	-	-	0.000	1.200	-
PTW Over Commercial - Studies/Demos (JHVs)	SS/CPIF	Boeing : El Segundo, CA	-	-	0.060	Oct 2023	-	-	-	-	-	-	0.000	0.060	-
PTW Over Commercial - mPower	MIPR	CSCO : Ft Meade, MD	-	-	10.000	Jan 2024	10.000	Jan 2025	-	-	-	10.000	0.000	20.000	-
PTW Over Commercial - PTES Upgrades	SS/CPIF	Boeing : El Segundo, CA	-	-	14.733	Apr 2024	40.760	Oct 2024	-	-	-	40.760	0.000	55.493	-
Technical Mission Analysis	RO	Aerospace : El Segundo, CA	-	-	-	-	-	-	-	-	-	-	0.000	0.000	-
Enterprise SE&I	Various	Various : Various	-	-	-	-	0.830	Nov 2024	-	-	-	0.830	0.000	0.830	-
SBIR/STTR	Allot	TBD : TBD	-	-	1.072	Mar 2024	1.991	Mar 2025	-	-	-	1.991	0.000	3.063	-
Subtotal			-	-	29.055	-	53.581	-	-	-	-	53.581	0.000	82.636	N/A

Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
FFRDC	SS/TBD	MITRE : Hanscom AFB, MA	-	-	0.050	Nov 2023	0.000	Nov 2024	-	-	-	0.000	0.000	0.050	-
A&AS	Various	Various : Various	-	-	1.532	Nov 2023	1.825	Nov 2024	-	-	-	1.825	0.000	3.357	-
Subtotal			-	-	1.582	-	1.825	-	-	-	-	1.825	0.000	3.407	N/A

			Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	-	30.637	55.406	-	55.406	0.000	86.043	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206760SF / <i>Protected Tactical Enterprise Service (PTES)</i>	Project (Number/Name) 643733 / <i>PTW Over Commercial</i>

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>PTW Over Commercial - Studies/Demonstrations</i>	
Astranis - Small Sats Study	
MIT/LL - MEO Demo	
Boeing - JHV Study	
<i>PTW Over Commercial - mPower</i>	
mPower Gateway Acquisition - Terminal Delivery & Installation	
mPower Gateway Acquisition - Site Prep	
<i>PTW Over Commercial - PTES Upgrades</i>	
PTES JHV Upgrades - JH Delivery & Installation	
Integration, Testing, Certification, & ATO	
Hub Integration with Gateway	
Hub Integration with Gateway Testing	
ATO IOC	
ATO FOC	
<i>PTW Over Commercial</i>	
Initial Operating Capability (IOC)	
Full Operational Capability (FOC)	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206760SF / <i>Protected Tactical Enterprise Service (PTES)</i>	Project (Number/Name) 643733 / <i>PTW Over Commercial</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>PTW Over Commercial - Studies/Demonstrations</i>				
Astranis - Small Sats Study	1	2023	4	2024
MIT/LL - MEO Demo	4	2024	4	2025
Boeing - JHV Study	2	2023	2	2025
<i>PTW Over Commercial - mPower</i>				
mPower Gateway Acquisition - Terminal Delivery & Installation	3	2024	2	2029
mPower Gateway Acquisition - Site Prep	2	2024	2	2029
<i>PTW Over Commercial - PTES Upgrades</i>				
PTES JHV Upgrades - JH Delivery & Installation	2	2025	3	2029
Integration, Testing, Certification, & ATO	2	2025	3	2029
Hub Integration with Gateway	3	2025	3	2029
Hub Integration with Gateway Testing	3	2025	3	2029
ATO IOC	1	2027	1	2027
ATO FOC	2	2029	2	2029
<i>PTW Over Commercial</i>				
Initial Operating Capability (IOC)	1	2027	1	2027
Full Operational Capability (FOC)	2	2029	2	2029

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 1206761SF / Protected Tactical Service (PTS)
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	238.414	360.126	596.996	0.000	596.996	656.025	465.054	483.274	492.806	Continuing	Continuing
643722: Protected Tactical SATCOM - Global (PTS_G)	-	0.000	0.000	247.997	0.000	247.997	310.009	0.000	0.000	0.000	0.000	558.006
643728: Protected Tactical SATCOM	-	238.414	360.126	348.999	0.000	348.999	346.016	465.054	483.274	492.806	Continuing	Continuing

Note

This program, BA 4, PE 1206761SF, project , Protected Tactical SATCOM - Global (PTS-G), is a new start.

A. Mission Description and Budget Item Justification

The global threat of electronic warfare attacks against space systems will expand in the coming years in both number and types of weapons. Threat development will very likely focus on jamming capabilities against dedicated military satellite communications (SATCOM). To address this critical threat, and in pursuit of more precise solutions for disaggregated strategic and tactical SATCOM, U.S Strategic Command (USSTRATCOM) and Air Force Space Command (AFSPC) initiated the Protected Anti-jam Tactical SATCOM (PATS) family-of-systems. The PATS integrated approach includes the Protected Tactical Satellite Communications (PTS) and Protected Tactical Enterprise Service (PTES) programs to mitigate adversarial jamming effects by using the Protected Tactical Waveform (PTW). The PTS program is the disaggregated tactical communications follow-on to the Advanced Extremely High Frequency (AEHF) program. The United States Space Force (USSF) is developing the PTS system to provide tactical users increased protection with worldwide and polar, beyond-line-of-sight, Anti-Jam (AJ), low-probability-of-intercept communications in benign and highly-contested anti-access/area denial environments utilizing the PTW. The PTS system's on-board payload/signal processing, antenna design, and advanced beam-forming using a distributed, diversified, and agile constellation of hostable payloads and high capacity free-flyers enables reliable tactical SATCOM within close proximities to adversarial jammers. The system also employs interfaces consistent with USSF's on-going resilience initiatives enhancing mission assurance and interoperability. The program's modular, flexible, scalable, and protected tactical payload constellation architecture will increase resiliency through distribution across a larger number of space platforms (e.g., hostable, free-flyer, international partnerships). The PTES program (PE 1206760SF, Project 643726) establishes the ground infrastructure for PTS, which operationalizes the PTW.

For the initial PTS phase, USSF is utilizing FY 2016 National Defense Authorization Act (NDAA), Middle Tier of Acquisition (MTA) for Rapid Prototyping (RP) authority and Section 815, Other Transaction Authority (OTA), to achieve an affordable, rapid, operational capability for the tactical warfighter. This strategy employs rapid payload development to progressively and incrementally deploy prototypes with residual capabilities demonstrated in an operational environment. These prototyping payloads (PTS-P) demonstrate innovative AJ technologies with modular and scalable payloads to meet validated military needs for protected tactical communications. This includes technical baseline development, systems engineering trade analyses, internal/external system integration and development, candidate system architecture evaluations, risk reduction demonstrations, prototyping concepts development, system testing, and enabling technologies maturation. The PTS Engineering, Manufacturing, and Development (EMD) Phase, called PTS-Resilient (PTS-R), will follow the PTS-P Phase to develop purpose-built "hub in space" satellites with full signal processing and switching capability that allows direct connectivity between users.

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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 1206761SF I Protected Tactical Service (PTS)

The PTS-P and PTS-R Phases include a Space Segment, Ground Segment, and Gateway Segment. For the Space Segment, the USSF strategy utilizes a payload-centric focus to enable an affordable, resilient space architecture. This enables hosting and rideshare opportunities with other US government, commercial, International Partner (IP) satellites or integration onto a commodity satellite bus. For the Ground Segment, PTS develops satellite command and control (C2) and leverages the PTES RP activity for mission and key management planning. The PTS Gateway Segment enables tactical warfighters reach back to global DoD Information Network. The PTS user Terminal Segment, not included in this PTS acquisition, will be procured by the military services utilizing low-cost PTW modem upgrades enabled by the Air Force - Army Anti-Jam Modem (A3M) ACAT III program and the Navy Wideband Anti-Jam Modem System (WAMS) technology demonstration program. PTS also develops the National Security Agency (NSA)-certified and space-flight qualified production-ready Space Hub End Cryptographic Unit (ECU). Starting the ECU as a single, early risk reduction effort targets a high-risk area of the PTS development and enables PTS program success.

In CY 2022 the Space Warfighting Analysis Center (SWAC) identified gaps in protected SATCOM capabilities relative to existing and planned capabilities against current and predicted user needs, with consideration of current and emerging challenges to both operating environments and system deployment. SWAC developed a Force Design (FD) to address these gaps, realigning capabilities and disaggregating mission sets.

Protected Tactical SATCOM - Global (PTS-G) is a key and enabling capability of the USSF Force Design (FD) that bridges the gap between the more focused capabilities provided by Protected Tactical SATCOM - Resilient (PTS-R), and the broadly-available but also the lower assured access capabilities provided by existing / emerging MILSATCOM and commercial services. PTS-G also augments current and future warfighter capability with increased global capacity. PTS-G is a moderate degree of assured access communications across military Ka-band and X-band using a disaggregated and proliferated sets of lower-complexity satellites. Space Systems Command (SSC) will develop the PTS-G space and ground systems to provide worldwide assured-access communications for tactical warfighters.

PTS-G will consist of two types of space vehicles (PTS-G-Ka and PTS-G-X), and ground infrastructure (system controller/hub with gateways), and will connect to existing Protected Anti-jam Tactical SATCOM (PATS) ground infrastructure (mission management system and cryptographic key management system) developed under the Protected Tactical Enterprise Service (PTES) program.

PTS-G will consist of multiple satellites that can provide either X-band or mil Ka-band transponded capability while also supporting the utilization of the PTW Waveform. PTW modems for user terminals will be acquired by each Service and by international partners.

Initially, PTS-G will provide capabilities in select regions. PTS-G will target a solution that can provide worldwide coverage. PTS-G will be interoperable with the PTES program to perform management and cryptographic key management for PTW users, but PTS-G will procure and install the associated PTES Joint Hubs and other ground infrastructure to operate the satellites, anchor the data, and perform O&S. In addition, the PTS-R system will be integrated with components of PTES and will be complementary to PTS-G.

PTS-G addresses the gap in protected communications capability identified in the USSF FD and in the Joint Space Communications Layer (JSCL) Initial Capabilities Document (ICD). To meet the warfighter requirements for protected tactical MILSATCOM and the capability gaps identified in these studies in a timely and cost-effective manner, use and modification of existing capabilities and Commercial Off the Shelf (COTS) products will be leveraged to the maximum extent, to develop the PTS-G capabilities. SSC will strategically execute prototyping and risk reduction as needed to develop and deploy PTS-G capabilities.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206761SF / <i>Protected Tactical Service (PTS)</i>
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This program element may include necessary civilian pay expenses required to manage, execute, and deliver PTS weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 1206392SF and 1206398SF.

This 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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	252.078	360.126	348.387	0.000	348.387
Current President's Budget	238.414	360.126	596.996	0.000	596.996
Total Adjustments	-13.664	0.000	248.609	0.000	248.609
• 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	-8.884	0.000			
• Other Adjustments	-4.780	0.000	248.609	0.000	248.609

Change Summary Explanation

FY 2023: -4.780M BTR for Space C2.

FY 2025: +247.413M adds PTS-G, which will deliver global X-band and Ka-band capabilities to the warfighter.

FY 2025: +1.196M inflation adjustment

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 4					R-1 Program Element (Number/Name) PE 1206761SF / <i>Protected Tactical Service (PTS)</i>				Project (Number/Name) 643722 / <i>Protected Tactical SATCOM - Global (PTS_G)</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
643722: <i>Protected Tactical SATCOM - Global (PTS_G)</i>	-	0.000	0.000	247.997	0.000	247.997	310.009	0.000	0.000	0.000	0.000	558.006
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 4, PE 1206761SF, project , Protected Tactical SATCOM - Global (PTS-G), is a new start.

A. Mission Description and Budget Item Justification

In CY 2022 the Space Warfighting Analysis Center (SWAC) identified gaps in protected SATCOM capabilities relative to existing and planned capabilities against current and predicted user needs, with consideration of current and emerging challenges to both operating environments and system deployment. SWAC developed a Force Design (FD) to address these gaps, realigning capabilities and disaggregating mission sets.

Protected Tactical SATCOM - Global (PTS-G) is a key and enabling capability of the USSF Force Design (FD) that bridges the gap between the more focused capabilities provided by Protected Tactical SATCOM - Resilient (PTS-R), and the broadly-available but also the lower assured access capabilities provided by existing / emerging MILSATCOM and commercial services. PTS-G also augments current and future warfighter capability with increased global capacity. PTS-G is a moderate degree of assured access communications across military Ka-band and X-band using a disaggregated and proliferated sets of lower-complexity satellites. Space Systems Command (SSC) will develop the PTS-G space and ground systems to provide worldwide assured-access communications for tactical warfighters.

PTS-G will consist of two types of space vehicles (PTS-G-Ka and PTS-G-X), and ground infrastructure (system controller/hub with gateways), and will connect to existing Protected Anti-jam Tactical SATCOM (PATS) ground infrastructure (mission management system and cryptographic key management system) developed under the Protected Tactical Enterprise Service (PTES) program.

PTS-G will consist of multiple satellites that can provide either X-band or mil Ka-band transponded capability while also supporting the utilization of the PTW Waveform. PTW modems for user terminals will be acquired by each Service and by international partners.

Initially, PTS-G will provide capabilities in select regions. PTS-G will target a solution that can provide worldwide coverage. PTS-G will be interoperable with the PTES program to perform management and cryptographic key management for PTW users, but PTS-G will procure and install the associated PTES Joint Hubs and other ground infrastructure to operate the satellites, anchor the data, and perform O&S. In addition, the PTS-R system will be integrated with components of PTES and will be complementary to PTS-G.

PTS-G addresses the gap in protected communications capability identified in the USSF FD and in the Joint Space Communications Layer (JSCL) Initial Capabilities Document (ICD). To meet the warfighter requirements for protected tactical MILSATCOM and the capability gaps identified in these studies in a timely and cost-effective

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206761SF / <i>Protected Tactical Service (PTS)</i>	Project (Number/Name) 643722 / <i>Protected Tactical SATCOM - Global (PTS_G)</i>
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manner, use and modification of existing capabilities and Commercial Off the Shelf (COTS) products will be leveraged to the maximum extent, to develop the PTS-G capabilities. SSC will strategically execute prototyping and risk reduction as needed to develop and deploy PTS-G capabilities.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
<p>Title: Protected Tactical SATCOM - Global (PTS-G)</p> <p>Description: PTS-G will consist of multiple satellites that can provide either x-band or mil-ka band transponded capability, and ground infrastructure (system controller/hub with gateways), and will connect to existing Protected Anti-jam Tactical SATCOM (PATS) ground infrastructure (mission management system and cryptographic key management system) developed under the Protected Tactical Enterprise Service (PTES) program pending any additional ground hardware and software updates that PTS-G will have to procure and still to modify the PTES baseline. PTS-G will use PTW-capable user modems but may also support transponded communications with other modems. PTW modems for user terminals will be acquired by each Service and by international partners.</p> <p>FY 2024 Plans: N/A</p> <p>FY 2025 Plans: The program office plans to release the PTS-G RFP in the 1st Quarter of FY 2025 for a target new start contract award of 2nd Quarter FY 2025. The program office will also refine financial and schedule considerations, finalize system requirements and designs, and begin production of PTS-G Space Vehicles (SV). Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased to support establishing the program of record, support contract award, and begin SV production.</p>	-	0.000	247.997
Accomplishments/Planned Programs Subtotals	-	0.000	247.997

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

The PTS-G Acquisition Strategy will be developed in FY 2024. The Program Office is working on Preliminary plans to include a competitive award to one or multiple contractors for the development of PTS-G vehicles (potentially driving competition between vendors along the vehicle type (x-band and mil-ka band) or within a single vehicle type), with IOC in FY 2028 and FOC in FY 2032. Contract type is undetermined at this point, but a firm-price solution will be primarily explored for the design,

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206761SF / <i>Protected Tactical Service (PTS)</i>	Project (Number/Name) 643722 / <i>Protected Tactical SATCOM - Global (PTS_G)</i>

build, test and operations phases of PTS-G. The 45th Test Squadron is the PTES Developmental Test Organization and the 4th Test & Evaluation Squadron is the Operational Test organization.

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206761SF / <i>Protected Tactical Service (PTS)</i>	Project (Number/Name) 643722 / <i>Protected Tactical SATCOM - Global (PTS_G)</i>

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

PTS-G	
RFP and Contract Award	██████████
Procurement	██
Fielding	██
Operational	██

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206761SF / <i>Protected Tactical Service (PTS)</i>	Project (Number/Name) 643722 / <i>Protected Tactical SATCOM - Global (PTS_G)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
PTS-G				
RFP and Contract Award	1	2025	2	2025
Procurement	3	2025	2	2027
Fielding	3	2027	4	2027
Operational	1	2028	1	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 4					R-1 Program Element (Number/Name) PE 1206761SF / <i>Protected Tactical Service (PTS)</i>				Project (Number/Name) 643728 / <i>Protected Tactical SATCOM</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
643728: <i>Protected Tactical SATCOM</i>	-	238.414	360.126	348.999	0.000	348.999	346.016	465.054	483.274	492.806	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

For the initial PTS phase, USSF is utilizing FY 2016 National Defense Authorization Act (NDAA), Middle Tier of Acquisition (MTA) for Rapid Prototyping (RP) authority and Section 815, Other Transaction Authority (OTA), to achieve an affordable, rapid, operational capability for the tactical warfighter. This strategy employs rapid payload development to progressively and incrementally deploy prototypes with residual capabilities demonstrated in an operational environment. These prototyping payloads (PTS-P) demonstrate innovative AJ technologies with modular and scalable payloads to meet validated military needs for protected tactical communications. This includes technical baseline development, systems engineering trade analyses, internal/external system integration and development, candidate system architecture evaluations, risk reduction demonstrations, prototyping concepts development, system testing, and enabling technologies maturation. The PTS Engineering, Manufacturing, and Development (EMD) Phase, called PTS-Resilient (PTS-R), will follow the PTS-P Phase to develop purpose-built "hub in space" satellites with full signal processing and switching capability that allows direct connectivity between users.

The PTS-P and PTS-R Phases include a Space Segment, Ground Segment, and Gateway Segment. For the Space Segment, the USSF strategy utilizes a payload-centric focus to enable an affordable, resilient space architecture. This enables hosting and rideshare opportunities with other US government, commercial, International Partner (IP) satellites or integration onto a commodity satellite bus. For the Ground Segment, PTS develops satellite command and control (C2) and leverages the PTES RP activity for mission and key management planning. The PTS Gateway Segment enables tactical warfighters reach back to global DoD Information Network. The PTS user Terminal Segment, not included in this PTS acquisition, will be procured by the military services utilizing low-cost PTW modem upgrades enabled by the Air Force-Army Anti-Jam Modem (A3M) ACAT III program and the Navy Wideband Anti-Jam Modem System (WAMS) technology demonstration program. PTS also develops the National Security Agency (NSA)-certified and space-flight qualified production-ready Space Hub End Cryptographic Unit (ECU). Starting the ECU as a single, early risk-reduction effort targets a high-risk area of the PTS development and enables PTS program success.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: PTS Prototype Design and Development	150.047	73.417	57.159
Description: Rapid prototyping of the PTS Space Segment for two PTS-P payloads and payload and bus C2 development/upgrades at the operating centers for the Ground Segment. Develop, demonstrate, test, and evaluate PTS hardware/software systems and key system components. Design and develop modular, scalable payloads to support hosted or free-flyer configurations. Includes integration to host vehicle or purchase of a bus for free-flyer configuration. Demonstrate prototype payload on-orbit performance. Evaluate PTS concept of operations with user participation and enable potential residual operational capability. Mature and validate user requirements. Support development, risk reduction efforts, and integration of PTS to deliver two prototype payloads available for launch in FY 2025, one as a hosted payload and one as a free-flyer.			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206761SF / <i>Protected Tactical Service (PTS)</i>	Project (Number/Name) 643728 / <i>Protected Tactical SATCOM</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p><i>FY 2024 Plans:</i> Continue prototyping and risk reduction efforts. Conduct final build, integration, and test activities to complete two PTS prototype payloads to be available for launch in FY 2025 as payloads on Boeing's WGS-11 (hosted) and Northrup Grumman Corporation (NGC)'s ESPASStar-HP satellites (free-flyer). Conduct cybersecurity testing and receive interim authorization to test (IATT). Conduct payload to space vehicle integration and testing. Conduct space vehicle to launch vehicle integration for two PTS-P payloads. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities include, but are not limited to; program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p><i>FY 2025 Plans:</i> Continue prototyping and risk reduction efforts. Continue and complete payload to space vehicle integration and testing. Continue and complete space vehicle to launch vehicle integration. Provide launch support activities for the rapid prototype payloads aboard Boeing's WGS-11 and Northrup Grumman Corporations (NGC's) ESPASStar-HP satellites. Continue cybersecurity testing and receive interim authorization to test (IATT). Conduct initial on-orbit test and demonstration of PTS payloads. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p><i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> FY 2025 decreased due to completion of prototype payload build. However, PTS-P Launch and Operations activities continue throughout FY 2025.</p>			
<p><i>Title:</i> PTS-P Space Hub End Cryptographic Unit (ECU)</p> <p><i>Description:</i> Develop a single, National Security Agency (NSA) certified, space-flight qualified, production-ready Space Hub ECU for integration with the PTS payloads. Conduct and design development to alleviate critical path risks to the launch of PTS payloads. Conduct requirements reviews, functional and design reviews, PTS interface development, Interface Control Document (ICD) coordination, and payload integration with PTS vendors.</p> <p><i>FY 2024 Plans:</i> Conduct quick-reaction troubleshooting/deficiency resolution for ECU during final integration and test of two PTS prototype payloads.</p> <p><i>FY 2025 Plans:</i></p>	11.720	5.757	4.900

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206761SF / <i>Protected Tactical Service (PTS)</i>	Project (Number/Name) 643728 / <i>Protected Tactical SATCOM</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
Complete final integration and test activities required for NSA certification. Conduct quick-reaction troubleshooting/deficiency resolution for ECU during SV integration and testing as well as on-orbit test and demonstration activities. FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to completion of final integration and test of two PTS prototype payloads.				
Title: PTS-P Ground Development Description: Develops and incorporates Mission Management System and Key Management System (MMS/KMS) modifications of the PTES program ground capability to plan and manage PTS, the associated cryptographic material and the SATCOM links they enable. Also develops and incorporates modifications to MMS of the WGS program ground capability (i.e. Common Network Planning Software (CNPS) and Wideband SATCOM Trend Analysis and Anomaly Resolution System (WSTARS)). FY 2024 Plans: Continue MMS/KMS upgrades to modify PTES Ground Segment to conduct PTS prototype payload MMS/KMS for on-orbit operations. Conduct integration and testing between the payloads and the PTES MMS/KMS, interoperability/interface and control of the ECU to the Payload, and compatibility with PATS user terminals. Support integration and testing by quickly responding with troubleshooting and deficiency resolution. Continue development, modifications, and integration of the WGS CNPS planning system and the WSTARS, which provides the overarching management of all sub-systems, providing situational awareness to all users of the Wideband SATCOM Operations Management System (WSOMS). FY 2025 Plans: Continue MMS/KMS upgrades to modify PTES Ground Segment to conduct PTS prototype payload MMS/KMS for on-orbit operations. Continue integration and testing between the payloads and the PTES MMS/KMS, interoperability/interface and control of the ECU to the Payload, and compatibility with PATS user terminals. Support integration and testing by quickly responding with troubleshooting and deficiency resolution. Continue development, modifications, and integration of the WGS CNPS planning system and the WSTARS, which provides the overarching management of all sub-systems, providing situational awareness to all users of the WSOMS. FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased due to ground segment modifications in support of the PTS prototype launch.		3.599	18.257	20.619
Title: PTS-P Gateway Development Description: Develop the Gateway Segment, also called PTS Ground Entry Terminal-Prototype (PGET-P), for integration with the PTS system. Conduct requirements reviews, functional and design reviews, PTS interface development, and Interface Control Document (ICD) coordination, and integration with PTW modems (i.e. A3M and WAMS)		7.567	5.420	3.000

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206761SF / <i>Protected Tactical Service (PTS)</i>	Project (Number/Name) 643728 / <i>Protected Tactical SATCOM</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p><i>FY 2024 Plans:</i> Conduct integration and test of PGET prototype. Conduct integration and test/demonstrations with PTW modems and payload prototypes to reduce system level risk. Deliver and install at site location in preparation for prototype payload launch.</p> <p><i>FY 2025 Plans:</i> Continue integration and test/demonstrations of two PGET prototypes with PTW modems and payload prototypes to reduce system level risk. Complete install of PGETs at test site locations. Support prototype payload launches as well on-orbit test and demonstration activities. Conduct quick-reaction troubleshooting/deficiency resolution for PGET during installation as well as on-orbit test and demonstration activities. Conduct planning for eventual PGET move and installation at final operational location.</p> <p><i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> FY 2025 decreased due to completion of key PGET integration and test activities.</p>			
<p><i>Title:</i> PTS Engineering and Manufacturing Development (EMD) Phase</p> <p><i>Description:</i> Continues PTS EMD Acquisition Planning, previously included in the PTS-P Design and Development Major Thrust (FY 2023). Beginning in FY 2024 it was separated as its own Major Thrust. FY 2024 will initiate the EMD phase for PTS space, ground, and gateway segments and key system components. Develop, build, test, and evaluate next PTS payloads to support hosted or free-flyer configurations available for launch in FY 2029. Includes payload and bus control development/upgrades at the operating centers. Deliver Initial Operational Capability (IOC) for protected communications against threats in FY 2030 with operational payloads. Continue to mature PTS concept of operations with user participation.</p> <p><i>FY 2024 Plans:</i> Award up to two payload contracts to begin design of PTS EMD Phase Payloads available for launch in FY 2029 following acquisition planning efforts begun in FY 2023 previously included in the PTS-P Design and Development Major Thrust. Conduct design and development of next PTS payloads to support hosted or free-flyer configurations. Includes integration to host vehicle or purchase of a bus for free-flier configuration. Develop, demonstrate, test, evaluate, and purchase PTS hardware and software systems. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p><i>FY 2025 Plans:</i> Continue significant ramp up of design and development activities for the 2 PTS-R Satellites as well as 2 Gateway Terminals and the Ground Control Segment for payload and bus control operations. Conduct major milestones to include Integrated Baseline Review, System Requirements Review and Preliminary Design Review and prepare for Critical Design Review. Purchase initial PTS-R hardware and software systems. Rapidly respond to implement system resiliency and situational awareness necessary</p>	0.000	161.252	162.124

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206761SF / <i>Protected Tactical Service (PTS)</i>	Project (Number/Name) 643728 / <i>Protected Tactical SATCOM</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.				
FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased due to ramp up of design and development activities for the 2 PTS-R Satellites as well as 2 Gateway Terminals and the Ground Control Segment for payload and bus control operations. These activities include preparing for and conducting Integrated Baseline, System Requirements, and Preliminary Design reviews with the contractors.				
Title: Protected Tactical Testbed		12.799	11.740	11.540
Description: Protected Tactical Testbed provides a government gold standard of reference for risk reduction and experimentation on critical technology elements for the space payload, terminals and networking segments of the PATS system. It enables system integration capabilities with industry and FFRDC partners for interoperability testing and conducting experiments to mature the PATS operations, with a focus on the PTW. Supports the PTS RP and EMD Phases.				
FY 2024 Plans: Continue to demonstrate interoperability between the PTS payload and the PTES MMS, interoperability/interface and control of the ECU to the PTS payload, and compatibility with PATS user terminals. Continue PTW Lead Service duties to demonstrate that PTW will support the department's Core Waveform program, to include verification of the PTW modem interoperability with the joint force. JSEC executes and enables critical testing activities for prototype payload contractors. Ensures the development process and impending product adhere to the tenets defined by the established requirements. Continue multi-service development of PATS user terminals A3M and Navy WAMS and final development stages of the PTES delivery. Continue use in outreach efforts to potential coalition partners and other emerging users to demonstrate capability using their space, ground, and user terminal assets.				
FY 2025 Plans: Continue to demonstrate interoperability between PTS and the PTES MMS, interoperability/interface and control of the ECU to the PTS payload, and compatibility with PATS user terminals. Continue PTW Lead Service duties to demonstrate that PTW will support the department's Core Waveform program, to include verification of the PTW modem interoperability with the joint force. Joint SATCOM Engineering Center (JSEC) executes and enables critical testing activities for PTS contractors. Ensures the development process and impending PTW products adhere to the tenets defined by the established Service requirements. Continue multi-Service testing and fielding of the PATS user terminals with A3M and Navy WAMS as well as early PTES operations. Continue use in outreach efforts to potential coalition partners and other emerging users to demonstrate capability using their space, ground, and user terminal assets.				
FY 2024 to FY 2025 Increase/Decrease Statement:				

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206761SF / <i>Protected Tactical Service (PTS)</i>	Project (Number/Name) 643728 / <i>Protected Tactical SATCOM</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
FY 2025 decreased slightly due to reduced JSEC cost-share requirements with other PATS segments.			
<p>Title: Technical Baseline Management, System Integration and Test Support</p> <p>Description: Perform as Government system integrator function through acquiring, designing, testing, and integrating key segments and interfaces. Mature technical baseline and interface requirements for the system. Conduct architectural engineering and system level integration planning supporting the PTS RP and EMD Phases for the Space, Ground, and Gateway Segments. Support, configure, and conduct integrated testing of the major PTS subsystems, segments, and end-to-end system, to include supporting testing conducted by the 96th Test Wing (TW). Manage the PTS open system architecture, refine interface requirements, and validate concept of operations through integrated system performance demonstrations.</p> <p>FY 2024 Plans: Continue to provide Satellite Vehicle (SV) integration and test support for two PTS prototype payloads availability for launch in FY 2025. Continue to manage and test key system interfaces for PTS prototype Ground, Space, and Gateway Segments as well as PATS ground and terminal segments to reduce integration risks. Continue to provide SV integration and test support to capability development and interface maturity of PTS prototype. Conduct key interface tests between the PTS prototype and emulators/simulators to reduce risk to PATS level integration with PTES and other partners' protected SATCOM programs. Conduct final launch integration activities to include SV to Launch Vehicle (LV) coordination for two PTS prototype payloads. Continue concept of operations development. Continue launch planning and activities and finalize coordination with national and international agencies for orbital slots and frequency allocation.</p> <p>FY 2025 Plans: Continue to manage and test key system interfaces for PTS Ground, Space, and Gateway Segments as well as PATS ground and terminal segments to reduce integration risks. Continue to provide SV integration and test support for two PTS prototype payloads availability for launch in FY 2025. Continue interface tests between the PTS prototype and emulators/simulators to reduce risk to PATS level integration with PTES. Conduct final launch integration activities to include SV to LV coordination for two PTS prototype payloads. Continue concept of operations development.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreases slightly due to completion of prototype payload integration and test activities prior to launch.</p>	52.682	84.283	89.657
Accomplishments/Planned Programs Subtotals	238.414	360.126	348.999

C. Other Program Funding Summary (\$ in Millions) N/A
Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206761SF / <i>Protected Tactical Service (PTS)</i>	Project (Number/Name) 643728 / <i>Protected Tactical SATCOM</i>

D. Acquisition Strategy

The PTS team utilizes the FY 2016 NDAA MTA guidance for Rapid Prototyping/Rapid Fielding and Section 815 OTA guidance in developing the acquisition strategy. This strategy places an emphasis on the rapid prototyping, production, and incremental iteration of PTS capability. This strategy takes the form of a series of successively honed and tailored spirals, focusing on payload development and hosting opportunities and incorporating lessons learned from Milstar, Enhanced Polar System (EPS), EPS-Recapitalization (EPS-R), AEHF, PTES, and commercial SATCOM practices. The program was initiated in June 2019 when the Space Hub ECU was competitively awarded as a Cost-Plus Incentive-Fee (CPIF) contract to L3-Harris under the Space Enterprise Consortium (SpEC) using OTA. For the Space Segment, PTS-P development of payloads 1-2 were competitively awarded as Firm-Fixed Price (FFP) contracts under the SpEC using OTA to NGC, Lockheed Martin, and Boeing. After completion of the prototype payload Preliminary Design Review (PDR) phase in March 2020, Boeing and NGC were selected to continue building their payloads for launch. Additionally, the Ground Segment (MMS/KMS upgrades) efficiently leverages Boeing's existing PTES contract (competitively awarded CPIF development contract) for PTES software updates and contracts with the US Army Project Management Integrated Enterprise Network (PM IEN) for modifications of WGS MMS. The Gateway Segment leverages agreements with the Naval Information Warfare Center (NIWC), PdM SATCOM (US Army), and MIT/LL. The 96th TW supports testing and initial operations and JSEC executes and enables critical testing activities for prototype payload contractors. On 4 Oct 2023, The Assistant Secretary of the Air Force for Space Acquisitions and Integration, approved the acquisition strategy for awarding the Space, Ground, and Gateway Segment development efforts required for the EMD Phase. The MTA is scheduled to transition to a Major Capability Acquisition (MCA) in 3QFY24, in order to continue PTS-P in the Prototype Phase and initiate PTS-R in the EMD Phase.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206761SF / <i>Protected Tactical Service (PTS)</i>	Project (Number/Name) 643728 / <i>Protected Tactical SATCOM</i>
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PTS-P Development (Hosted)	C/FFP	Boeing : El Segundo, CA	-	35.804	Nov 2022	31.497	Oct 2023	13.110	Oct 2024	-		13.110	0.000	80.411	-
PTS-P Development (Free-Flyer)	C/FFP	Northrop Grumman : Redondo Beach, CA	-	114.243	Nov 2022	41.920	Oct 2023	44.049	Oct 2024	-		44.049	Continuing	Continuing	-
Space Hub End Cryptographic Unit (ECU)	C/CPIF	L3Harris East : Camden, NJ	-	9.861	Jan 2023	4.330	Oct 2023	3.500	Oct 2024	-		3.500	0.000	17.691	-
NSA (ECU Support)	MIPR	TBD : TBD	-	1.859	Mar 2023	1.427	Oct 2023	1.400	Oct 2024	-		1.400	Continuing	Continuing	-
PTS-P Ground Segment Development MMS/KMS	C/FFP	Boeing : El Segundo, CA	-	-		12.934	Nov 2023	17.760	Nov 2024	-		17.760	Continuing	Continuing	-
PTS-P Ground Segment Development - CNPS	MIPR	TBD : TBD	-	1.025	May 2023	5.223	Nov 2023	2.759	Nov 2024	-		2.759	Continuing	Continuing	-
PTS-P Ground Segment Development - WSTARS	MIPR	TBD : TBD	-	2.574	Jul 2023	0.100	Nov 2023	0.100	Nov 2024	-		0.100	Continuing	Continuing	-
PTS-P Gateway Segment Development	Various	Various : Various	-	7.567	Oct 2022	5.420	Oct 2023	3.000	Oct 2024	-		3.000	0.000	15.987	-
PTS-R EMD Phase - Payload Development	TBD	TBD : TBD	-	-		154.610	Mar 2024	162.124	Oct 2024	-		162.124	Continuing	Continuing	-
PTS-R EMD Phase - ECU	TBD	TBD : TBD	-	-		1.161	Mar 2024	-		-		-	Continuing	Continuing	-
PTS-R EMD Phase - Ground/Gateway Development	TBD	TBD : TBD	-	-		5.504	Mar 2024	-		-		-	Continuing	Continuing	-
Protected Tactical Testbed	Various	Various : Various	-	9.100	Dec 2022	8.400	Nov 2023	8.200	Nov 2024	-		8.200	Continuing	Continuing	-
JSEC (Protected Tactical Testbed Support)	MIPR	TBD : TBD	-	3.699	Jan 2023	3.340	Nov 2023	3.340	Nov 2024	-		3.340	Continuing	Continuing	-
Technical Baseline Management and System Integration Test Support	Various	Various : Various	-	3.746	Nov 2022	19.797	Oct 2023	22.031	Oct 2024	-		22.031	Continuing	Continuing	-
Technical Mission Analysis (TMA)	RO	Aerospace : El Segundo, CA	-	14.781	Nov 2022	23.463	Jan 2024	22.736	Jan 2025	-		22.736	Continuing	Continuing	-
Enterprise SE&I	Various	Various : Various	-	23.591	Jan 2023	14.630	Oct 2023	13.981	Oct 2024	-		13.981	Continuing	Continuing	-
SBIR/STTR	TBD	TBD : TBD	-	-		12.604	Mar 2024	12.564	Mar 2025	-		12.564	Continuing	Continuing	-
Subtotal			-	227.850		346.360		330.654		-		330.654	Continuing	Continuing	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206761SF / <i>Protected Tactical Service (PTS)</i>	Project (Number/Name) 643728 / <i>Protected Tactical SATCOM</i>

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>PTS-P Design, Development, I&T</i>	
PTS Prototype Payload Design and Development	
PTS Prototypes SV I&T	
PTS Prototype 1 Available for Launch	
PTS Prototype 2 Available for Launch	
PTS-P Launch and Operations	
<i>PTS RP Space Hub End Cryptographic Unit (ECU)</i>	
PTS RP ECU Design/Certification	
<i>PTS RP Ground Segment Development</i>	
PTS RP MMS/KMS Upgrades	
<i>PTS RP Gateway Segment Development</i>	
PTS RP PGET-P Development	
<i>PTS Engineering, Manufacturing, & Development (EMD) Phase</i>	
PTS EMD Acquisition Planning	
PTS EMD ATP	
PTS EMD Payload Design, Build, and Test	
PTS EMD SV I&T	
PTS EMD SV Available for Launch	
PTS EMD Ground Development	
PTS EMD Gateway Development	
<i>Technical Baseline Management and Test</i>	

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206761SF / <i>Protected Tactical Service (PTS)</i>	Project (Number/Name) 643728 / <i>Protected Tactical SATCOM</i>
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	FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
System Integration Test Support/Protected Tactical Testbed																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206761SF / <i>Protected Tactical Service (PTS)</i>	Project (Number/Name) 643728 / <i>Protected Tactical SATCOM</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>PTS-P Design, Development, I&T</i>				
PTS Prototype Payload Design and Development	1	2023	4	2023
PTS Prototypes SV I&T	2	2024	4	2024
PTS Prototype 1 Available for Launch	1	2025	1	2025
PTS Prototype 2 Available for Launch	2	2025	2	2025
PTS-P Launch and Operations	1	2025	4	2029
<i>PTS RP Space Hub End Cryptographic Unit (ECU)</i>				
PTS RP ECU Design/Certification	1	2023	2	2025
<i>PTS RP Ground Segment Development</i>				
PTS RP MMS/KMS Upgrades	1	2023	1	2026
<i>PTS RP Gateway Segment Development</i>				
PTS RP PGET-P Development	1	2023	1	2025
<i>PTS Engineering, Manufacturing, & Development (EMD) Phase</i>				
PTS EMD Acquisition Planning	3	2023	4	2024
PTS EMD ATP	4	2024	4	2024
PTS EMD Payload Design, Build, and Test	4	2024	1	2028
PTS EMD SV I&T	1	2028	4	2029
PTS EMD SV Available for Launch	4	2029	4	2029
PTS EMD Ground Development	4	2024	4	2029
PTS EMD Gateway Development	4	2024	4	2029
<i>Technical Baseline Management and Test</i>				
System Integration Test Support/Protected Tactical Testbed	1	2023	4	2029

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 1206855SF I Evolved Strategic SATCOM (ESS)
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	491.530	632.833	1,046.161	0.000	1,046.161	1,283.922	1,061.416	970.789	745.132	Continuing	Continuing
643725: Evolved Strategic SATCOM (ESS)	-	491.530	632.833	1,046.161	0.000	1,046.161	1,283.922	1,061.416	970.789	745.132	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

ESS is the backbone for Joint All Domain Nuclear Command, Control and Communications (NC3). The system will replace Advanced Extremely High Frequency (AEHF) Strategic Satellite Communications (SATCOM) services to provide global, integrated, survivable, resilient, and dynamic ground and satellite communications for assured strategic endurance across the conflict continuum. The ESS program underwent a resiliency architecture shift to address emerging sophisticated threats and to ensure strategic SATCOM capabilities are available to the National Command Authority (NCA), Combatant Commanders, and joint warfighters in any potential future conflict. It will provide the only arctic DoD strategic communication capability across the joint enterprise, and will provide worldwide secure, jam-resistant communications for strategic ground, sea, and air assets. ESS will support existing strategic user terminals in all operational environments.

ESS is acquired and developed in several parallel efforts to accelerate delivery of capability to warfighters by the strategic need date in FY 2032. The ESS System includes a Space Segment (ACAT-I), Ground, User, and Integration Segment (ACAT-I equiv), and a Crypto Segment (ACAT-III). The Space Segment is leveraging a Middle-Tier Acquisition (MTA) for rapid prototyping, technology maturation, and resilient strategic capability risk reduction. The Ground Segment, also known as GRIFFON - Ground Resilient Integration & Framework for Operational NC3, is comprised of the Ground Integration and Framework (GIF), System of Systems Integration (SoSI), and Mission Software Applications. This enables a resilient and modular cybersecure architecture that bridges the gap between modern software best practices and legacy user terminal capability. The GIF/SoSI is leveraging Software Acquisition Pathway Other Transactional Authority for rapid prototyping of ground software. The ESS Ground Framework creates the cybersecure software development, integration, and operational environments utilizing agile Modular Open Systems Approach (MOSA) principles and onboards hosted external mission applications and services. The SoSI ensures all ESS segments that are acquired in parallel, in addition to external entities, work together to accomplish the mission. Additional mission-unique capabilities, like In-Band C2, Out-of-Band C2, Strategic Mission Planning, Test, Evaluation, Training, and other similar mission capabilities will be acquired modularly as applications that will be hosted on the ESS Ground Framework. The Crypto Segment is focused on the development, integration and testing of National Security Agency (NSA)-certified End-Cryptographic Units (ECUs) that are required for secure strategic communications encryption in the ESS payloads, bus, test terminals, and user terminals.

The modular acquisition approach allows the program to avoid "vendor lock" in all segments and creates opportunities for industry competition and teaming with small innovative non-traditional partners for the Ground Segment on the Space Enterprise Consortium (SpEC) Other Transactional Authority (OTA). SpEC requires ESS Ground Segment Prime vendors (currently Lockheed Martin & Raytheon) to utilize small businesses for no less than 46% of prototyping work, allowing the program to integrate innovative best practices, increase agility, reduce costs and development lifecycles, while also expanding the resilient and strategic SATCOM ecosystem.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206855SF / <i>Evolved Strategic SATCOM (ESS)</i>
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The ESS system adheres to NC3 classification requirements. 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 Advanced Extremely High Frequency (AEHF) strategic requirements and mission performance with enhancements for increased resiliency and cybersecurity. The ESS system will satisfy emerging requirements using modular open system approaches to support incremental enhancements.

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 1206392SF, 1206398SF.

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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	519.047	632.833	1,272.983	0.000	1,272.983
Current President's Budget	491.530	632.833	1,046.161	0.000	1,046.161
Total Adjustments	-27.517	0.000	-226.822	0.000	-226.822
• 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	-9.648	0.000			
• SBIR/STTR Transfer	-17.869	0.000			
• Other Adjustments	0.000	0.000	-226.822	0.000	-226.822

Change Summary Explanation

FY 2023: -3.623M MGUE INC2 BTR

FY 2023: -6.025M SSPT BTR

FY 2025: -228.600M; Reduced based on FY 2025 Non-Advocate Cost Assessment (NACA) estimate to reflect Threshold Survivability requirements and to meet higher headquarter priorities.

FY 2025: +2.096 inflation adjustment

FY 2025: -0.318M realignment to higher priorities

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206855SF / <i>Evolved Strategic SATCOM (ESS)</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Title: Space Segment Prototyping</p> <p>Description: Invest in technology and demonstrations that enable continued development of a modernized, strategic payload and other key technology prototypes, risk reduction, and space segment design utilizing competitive rapid-prototyping contracts. Enables long-term return on investment through an energized Strategic SATCOM industrial base, increased competition, promotion of innovation by driving diverse designs, 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.</p> <p>FY 2024 Plans: Continue execution of two rapid prototyping contracts through payload technology development and demonstrations that best align to the new ESS proliferated and resilient architecture. The existing contracts for the rapid prototyping phase will be funded to perform additional nonrecurring engineering activities to further increase the technology readiness levels (TRL) of various space components prior to the Critical Design Review (CDR), mitigate overarching program schedule risk, and reduce development durations to respond to threats from adversaries. Purchase long lead items identified on the critical path or at high risk due to supply chain shortages to meet the system strategic need date. Build upon the System Functional Review (SFR) technical baselines and artifacts, complete system engineering trade studies, and finalize requirements traces and allocations to conduct Preliminary Design Reviews (PDR). Continue to demonstrate and validate system capabilities, with a focus on integration of the previously completed efforts leading to end-to-end Capstone demonstrations, which will show the capability for each contractors' ESS payload to execute the strategic satellite communications mission. Ensure payload cybersecurity designs are aligned with ESS program cybersecurity strategy. Execute post-PDR activities and begin preparations for CDR. Additional efforts beyond the existing rapid prototyping firm fixed price contracts may be utilized to maximize the technical capability delivered to the warfighter and support Nuclear Command, Control, and Communication (NC3) modernization efforts. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Other activities may include, but are not limited to program office support, studies, technical analysis, experimentation, and prototyping.</p> <p>FY 2025 Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to contract closeout for both rapid prototyping contracts as all rapid prototyping work ends with the award of the Space Development and Production Contract in FY 2025.</p>	342.360	357.666	0.000
<p>Title: Space Development and Production</p> <p>Description: This activity is not a new start as it continues space development activity that was initiated in the Space Segment Prototyping major thrust. Space Development and Production builds upon the 4+ Years of Space Segment Prototyping and</p>	-	-	724.350

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206855SF / <i>Evolved Strategic SATCOM (ESS)</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
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<p>delivers the next generation of NC3 Strategic SATCOM to the warfighter. The ESS Space Development and Production contract will design, develop, build, test, and deliver resilient, cybersecure, Extended Data Rate (XDR) space vehicles that ensure communications through all warfighting environments. This effort will initiate with the development and production of Space Vehicles 1- 4 in order to achieve IOC by 2032 and continuing through FOC.</p> <p>FY 2025 Plans: ESS will finalize source selection, award the Space Development and Production contract, conduct a delta Preliminary Design Review (PDR), and establish a program baseline through an Integrated Baseline Review (IBR). Simultaneously, numerous Non-Recurring Engineering (NRE) activities will begin, covering essential engineering and process documents. Long lead procurement of hardware and software for SV01-SV02, including design documents and non-deliverables, will also commence.</p> <p>The program will execute initial NRE for developing and integrating threat-driven resiliency payloads and building the ESS Payload Emulator. The Space Development and Production contract winner will initiate In-Band-C2 application development on the GIF Framework, originally planned as a standalone application on the SpEC OTA. Additionally, the program will support NRE for the System of Systems Integration between ESS system segments (Ground and ECU), all with the goal of setting conditions for a successful CDR in the following year.</p> <p>Ancillary activities will involve starting or continuing special studies for survivability, resiliency, risk reduction, and architectural trades.</p> <p>Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased due to the award of the space development and production contract and the associated rapid increase of personnel and material required to execute the contract on both the government and contractor teams. To meet the strategic Need Date, and combat the evolving threats faced in space, the program will conduct non-recurring engineering activities associated with the bus, payload, and resiliency measures, purchase long lead items for the first two satellites, and increase government program management and engineering support.</p>			
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Title: Ground Resilient Integration & Framework for Operational NC3 (GRIFFON)	125.563	216.486	290.643
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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206855SF / <i>Evolved Strategic SATCOM (ESS)</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
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Description: The previous thrust entitled "ESS Ground Segment and Space-to-Ground Integration" has changed to "Ground Resilient Integration and Framework for Operational NC3 (GRIFFON)" to recognize program of record establishment. Develop and field the ESS Ground Segment and System Integrator (SoSI). GRIFFON is the Ground Segment solution for ESS. It includes ESS Ground Integration and Framework (GIF), SoSI, and software application development efforts. GRIFFON software applications include mission planning, command and control (both in-band and out-of-band) along with other architecture activities required to support the ESS Space Segment, system operators, strategic users, and joint Combatant Commands (COCOMs).

FY 2024 Plans:
Release full-competition RFP for Mission Planning applications and Command and Control applications. Execute multiple GRIFFON prototype demonstration contracts, and down select to one GIF and SoSI contract. Develop and release follow-on RFP for further agile software and modular framework prototype development. Conduct studies and source selection activities to award multiple contracts for command and control, and other software applications. Fund program office, Federally Funded Research and Development Centers (FFRDC), and University Affiliated Research Center (UARC) support to execute a competition which acquires a secure software development framework/pipeline and mission planning applications. Develop a development, security, and operations (DevSecOps) pipeline for software vendors to test their applications on the ground framework mission partners to conduct end-to-end integration testing. Procure ground system specific applications for satellite control, mission planning, and satellite integration and test. Conduct early integration testing with users and legacy systems. Continue software catalogue creation and functionally decompose software into a delivery roadmap aligned with strategic framework. Develop end user agreements with operational sites outlining deliveries and key milestones. Solidify integration testing and connectivity with PKMA and cryptographic modernization efforts with the NSA. Modify legacy terminal programs to ensure entire integrated system functions within modernized cyber architecture. Invest in Command Post Terminal modernization (cryptographic and cybersecurity needs, etc.) necessary to support ESS and meet critical ground segment, space segment, and systems integration need dates. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.

FY 2025 Plans:
Down-select to one ESS ground framework and integration prototype vendor (GIF/SoSI). Execute multiple GRIFFON prototype demonstration contracts, with multiple prototypes being selected for maturation towards Ground Advanced Integration and Technology (AI&T) in FY 2027 and System AI&T in FY 2029. Conduct studies and source selection activities for endurance capability, command and control, mission control, and user terminal interface. Fund program office, FFRDC, and UARC support to execute competitions that acquire and integrate a secure software development framework and cyber secure software delivery pipeline, software applications, user interfaces, and ensures ESS alignment with enterprise community. Further mature a development, security, and operations (DevSecOps) pipeline for software vendors to test their applications on the ground

	FY 2023	FY 2024	FY 2025

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206855SF / <i>Evolved Strategic SATCOM (ESS)</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>framework to conduct end-to-end integration testing. Conduct early integration testing at government sites. Develop user agreements with operational sites outlining deliveries and key milestones to ensure system functionality by FY 2029, prior to the first ESS space launch. Solidify integration testing and connectivity with Protected SATCOM Key Management Architecture (PKMA) and cryptographic modernization efforts with the NSA. Identify any necessary modifications to legacy terminal programs to ensure entire integrated system functions within modernized cyber architecture. Invest in command and control terminal modernization and acquisition (cryptographic and cybersecurity needs) necessary to support ESS and meet critical ground segment, space segment, and systems integration need dates. Continue development activities in support of the ground segment and system/mission integration schedules. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased to execute multiple development contracts and support increased space and ground integration activities.</p>			
<p>Title: End-Cryptographic Unit (ECU)</p> <p>Description: Develop and deliver the NSA-certified ECUs required for secure strategic communications encryption in the ESS payloads, bus, and payload test terminals in accordance with the approved ECU acquisition strategy and schedule. Upon development completion, production ECU units will be delivered as government-furnished equipment (GFE) for integration and testing with the ESS payloads and payload test terminals.</p> <p>FY 2024 Plans: Continue to execute ECU contract through the Engineering and Manufacturing Development (EMD) phase. Fund Cryptologic and Cyber Systems Division (CCSD), UARC, and FFRDC to provide program office support, planning, GFE, studies, technical analyses and information or resources in support of prototyping activities. Support ESS ECU requirements for the payload, bus, and test terminal. Provide NSA-certified crypto solutions to support Telemetry, Tracking, and Command (TT&C), Mission Data (MD), Transmission Security (TRANSEC), and Communications Security (COMSEC); includes all required cyber, resiliency, and security activities required, as well as Government support for contractor management and oversight. Studies and technical support will assist with requirements trades, technical approaches, threat assessment and mitigation approaches, and ESS testing assets to include the Strategic Test Terminal (ST2). Continue to coordinate with the NSA on the development and certification of ECU requirements and the delivery of cryptographic keying material to support the development effort.</p> <p>FY 2025 Plans: Upon successful System Requirements Review (SRR), System Functional Review (SFR), and Preliminary Design Review (PDR) continue to execute ECU contract through the Engineering and Manufacturing Development (EMD) phase and mature payload and test terminal ECU designs to CDR- level maturity. Fund CCSD, UARC, and FFRDC to provide program office</p>	23.607	58.681	31.168

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206855SF / <i>Evolved Strategic SATCOM (ESS)</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>support, planning, GFE, studies, technical analyses and information or resources in conjunction with newly awarded ESS Space Development and Production Contract. Provide NSA-certified crypto solutions to support Telemetry, Tracking, and Command (TT&C), Mission Data, Transmission Security (TRANSEC), and Communications Security (COMSEC); includes all required cyber, resiliency, and security activities required, as well as Government support for contractor management and oversight. Assist with requirements trades, technical design approaches, threat assessment and mitigation approaches, and ESS testing assets to include the test terminal. Continue coordination with NSA through the ECU Certification process and cryptographic key material delivery. Start work to modify PKMA and Key Management Infrastructure (KMI) to be interoperable to support the ESS constellation.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased to align activity with newly awarded ESS Space Development and Production contract.</p>			
Accomplishments/Planned Programs Subtotals	491.530	632.833	1,046.161

D. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

E. Acquisition Strategy

The Milestone Decision Authority (MDA) designated the ESS Space Segment as an FY 2016 National Defense Authorization Act MTA (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. The ESS Program Office used this approach to award three space segment contracts in late FY 2020 and early FY 2021 that focus on reducing space segment risks with the objective of maximizing ESS demonstrated capability for the payload and other key technologies.

In FY 2022 the Program Office executed the ESS Prime Pivot Study to provide a more robust and resilient capability to the Joint Warfighter. As a result of the ESS Prime Pivot Study, only the two most promising and lowest risk vendors to reaching the strategic need date had their options executed. The vendor's schedule was further accelerated by executing contract option 3, one year earlier as well as starting contract option 2 three months earlier. The ESS vendor termination was risk informed and required to mature technology readiness levels within available funding. The remaining vendors are being awarded Engineer Change Proposals (ECP) of option 3 focused on vendor specific risk reduction, threat-resilient crosslink technical maturation, satellite processor upgrades, resiliency hosted payload development, and information technology cybersecurity enhancements.

In June 2023, the ESS Space Production Acquisition Source Panel (ASP) was approved by the Space Force Service Acquisition Executive. This ASP finalized key design trades, contract types, and the comprehensive approach to procuring ESS Space vehicles. The ASP highlighted the transition from MTA to MCA, declaring the

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206855SF / <i>Evolved Strategic SATCOM (ESS)</i>	
<p>ESS Space Segment as an ACAT IB entering in Pre-Milestone B. The RFP and source selection will determine which space prototyping contractor is positioned for the space segment Build, I&T, and Delivery follow-on contract.</p> <p>Competition during space prototyping is energizing the industrial base in strategic SATCOM; injecting diverse technical processes and integration approaches; burning down risks early and identifying/correcting issues as early as possible; and decreasing traditional fielding timelines to support a more resilient, responsive architecture against emerging threats. Success during competitive rapid-prototyping determines and informs follow-on Build, I&T, and Delivery.</p> <p>In June 2022, the Space Force Service Acquisition Executive (SAE) approved the use of Department of Defense Instruction (DoDI) 5000.87 Software Acquisition Pathway for the GRIFFON Ground Segment. This pathway will be used to design and develop a software-intensive ground system to promote agile software development, control program timelines, cost, and foster innovation that is needed for resilient NC3 systems. In November 2023, the SAE approved the acquisition strategy for the In-Band C2 software application.</p> <p>GRIFFON is the ground segment solution for ESS, and it includes ESS GIF, SoSI, and Software Application development efforts. The GIF will scope and provide advisory services on the ground system infrastructure to provide a software architecture and support the corresponding software factory. The GIF contractor will provide continual test and delivery services of the DevSecOps pipeline and software from different development and pre-production environments. It will also ensure NC3 compliance. The System Integrator (SoSI) will ensure all ESS segments operate cohesively to deliver interoperable capability. The SoSI will facilitate requirement verification, validation, and sell-off to maintain an authoritative source of truth throughout the system integration process. Mission unique capability will be provided by software applications. The ESS Ground Segment awarded two 18-month competitive contracts in FY23 for the GIF and SoSI prototypes. There will be a down-select to one Framework and Integration prototype vendor in 1st Quarter FY 2025. The Strategic Mission Planning Applications will be competitively awarded, with projected demonstration contracts beginning in FY 2024, and a down-select to two prototypes in 1st Quarter FY 2025. The In-Band C2 application will be competed with the space RFP, for prototype start in FY 2025. The remaining application acquisition strategies will go through Space Force SAE approval prior to the GRIFFON program transitioning from the Planning Phase to the Execution Phase of the Software Acquisition Pathway.</p> <p>An ECU acquisition strategy was approved as an ACAT III program by the PEO in FY 2021. The ESS program office partnered with the Air Force Life Cycle Management Center CCSD for ECU crypto development, both on the space vehicle for payload and bus cryptographic devices and in the test terminal. Using a CCSD-led competitive RFP, a contract for payload and payload test terminal ECU development was awarded in 1st Quarter FY 2024.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force												Date: March 2024			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
3620F / 4				PE 1206855SF / Evolved Strategic SATCOM (ESS)				643725 / Evolved Strategic SATCOM (ESS)							
Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
ESS Space Segment Build, I&T and Delivery Follow-on	C/Variou	TBD : TBD	-	-		-		614.180	Dec 2024	-		614.180	Continuing	Continuing	-
ESS Space Segment Prototyping	SS/FFP	Various : Various	-	332.727	Oct 2022	-		-		-		-	0.000	332.727	-
ESS Space Segment Prototyping Northrup Grumman	SS/FFP	Northrup Grumman : Redondo Beach, CA	-	-		146.000	Dec 2023	-		-		-	0.000	146.000	-
ESS Space Segment Prototyping Boeing	SS/FFP	Boeing : El Segundo, CA	-	-		142.340	Dec 2023	-		-		-	0.000	142.340	-
ESS Ground Segment and Space-to-Ground Integration	Variou	Various : Various	-	74.187	Jan 2023	-		-		-		-	0.000	74.187	-
ESS GRIFFON: GIF and SOSI Demo Ctr 1	C/FFP	Lockheed Martin : El Segundo, CA	-	-		15.378	Jan 2024	-		-		-	0.000	15.378	-
ESS GRIFFON: GIF and SOSI Demo Ctr 2	C/FFP	Raytheon : El Segundo, CA	-	-		15.378	Jan 2024	-		-		-	0.000	15.378	-
ESS GRIFFON: GIF and SOSI Follow-on	C/FFP	TBD : TBD	-	-		23.600	Jul 2024	62.600	Nov 2024	-		62.600	Continuing	Continuing	-
ESS GRIFFON: Software Applications MP Demo Ctr 1	C/FFP	TBD : TBD	-	-		23.100	Mar 2024	23.400	Mar 2025	-		23.400	0.000	46.500	-
ESS GRIFFON: Software Applications MP Demo Ctr 2	C/FFP	TBD : TBD	-	-		23.100	Mar 2024	23.400	Mar 2025	-		23.400	0.000	46.500	-
ESS GRIFFON: In-Band Study	SS/FFP	TBD : TBD	-	-		13.100	Jun 2024	-		-		-	Continuing	Continuing	-
ESS GRIFFON: In-Band	C/CPIF	Not specified. : TBD	-	-		-		32.900	Dec 2024	-		32.900	Continuing	Continuing	-
ESS GRIFFON: Out-of-Band	TBD	TBD : TBD	-	-		11.100	May 2024	22.900	Mar 2025	-		22.900	Continuing	Continuing	-
ESS Terminal C2 Compatibility Study	TBD	TBD : TBD	-	-		17.940	Dec 2023	17.944	Dec 2024	-		17.944	Continuing	Continuing	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206855SF / Evolved Strategic SATCOM (ESS)	Project (Number/Name) 643725 / Evolved Strategic SATCOM (ESS)
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
ESS Command and Control (C-2) Terminal Acquisition	TBD	TBD : TBD	-	-		-		37.580	Jan 2025	-		37.580	Continuing	Continuing	-
ESS User Terminal Studies	SS/FFP	Raytheon Collins : Marlborough, MA	-	-	12.040	Apr 2024	8.900	Feb 2025	-			8.900	0.000	20.940	-
ESS GRIFFON Software Independent Framework Tester (SWIFT)	SS/CPFF	JHU/APL : Laurel, MD	-	-	13.040	Mar 2024	10.000	May 2025	-			10.000	Continuing	Continuing	-
ESS IT Upgrades to NC3 cybersecurity Follow-On	C/FFP	GDIT : Falls Church, VA	-	-	7.030	Mar 2024	6.900	Mar 2025	-			6.900	Continuing	Continuing	-
ESS Test Terminal Development and Support	SS/CPFF	MIT/LL : Lexington, MA	-	-	17.490	Nov 2023	11.000	Nov 2024	-			11.000	Continuing	Continuing	-
ESS Acquisition and Mission Planning Support	SS/CPFF	JHU/APL : Laurel, MD	-	-	-		5.000	Dec 2024	-			5.000	Continuing	Continuing	-
ESS Engineering Support	MIPR	BAH : San Antonio, TX	-	-	-		8.755	Dec 2024	-			8.755	Continuing	Continuing	-
ESS End-Cryptographic Unit (ECU)	C/Variou	Viasat : Carlsbad, CA	-	11.221	Jun 2023	50.415	Dec 2023	14.700	Dec 2024	-		14.700	Continuing	Continuing	-
ESS Crypto PKMA /KMI Modifications	TBD	Not specified. : TBD	-	-		-		9.948	Dec 2024	-		9.948	Continuing	Continuing	-
ESS Technical Mission Analysis	RO	Various : Various	-	15.256	Nov 2022	22.099	Nov 2023	15.636	Nov 2024	-		15.636	Continuing	Continuing	-
ESS Enterprise SE&I	C/CPIF	Linquest : Los Angeles, CA	-	22.636	Feb 2023	19.653	Feb 2024	31.513	Feb 2025	-		31.513	Continuing	Continuing	-
ESS SBIR/STTR	Allot	Not specified. : TBD	-	-		22.149	Mar 2024	37.662	Mar 2025	-		37.662	Continuing	Continuing	-
Subtotal			-	456.027		594.952		994.918		-		994.918	Continuing	Continuing	N/A

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206855SF / Evolved Strategic SATCOM (ESS)	Project (Number/Name) 643725 / Evolved Strategic SATCOM (ESS)

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Space Segment Prototyping				
System and Mission Integration	1	2023	4	2024
Space Segment Prototyping-Execution	1	2023	4	2024
Space Development and Production				
System and Mission Integration	1	2025	4	2029
Space Segment Build, I&T and Delivery Follow-on - Contract Award	1	2025	1	2025
Space Segment Build, I&T and Delivery Follow-on - Execution	1	2025	4	2029
GRIFFON				
Command and Control efforts	1	2023	4	2029
GIF and SOSI Planning	1	2023	2	2023
GIF and SOSI Demo - Contract Award (2 contractors)	2	2023	2	2023
GIF and SOSI Demo - Execution	2	2023	4	2024
GIF and SOSI Follow-on - Contract Award	1	2025	1	2025
GIF and SOSI Follow-on - Execution	1	2025	1	2029
Mission Planning Software Application Planning	1	2023	2	2024
Mission Planning Software Application Demo - Contract Award (2 contractors)	2	2025	2	2025
Mission Planning Software Application Demo - Execution (2 contractors)	2	2025	3	2026
Mission Planning Software Application Follow-on - Contract Award	3	2026	3	2026
Mission Planning Software Application Follow-on - Execution	3	2026	4	2029
IT Upgrades to NC3 Cybersecurity				
Upgrades to NC3 Cybersecurity	2	2023	3	2024
Upgrades to NC3 Cybersecurity Follow-On	3	2024	2	2029

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206855SF / <i>Evolved Strategic SATCOM (ESS)</i>	Project (Number/Name) 643725 / <i>Evolved Strategic SATCOM (ESS)</i>

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>End-Cryptographic Unit (ECU)</i>				
Early Definition & Acquisition Planning	1	2023	1	2024
Contract Award	1	2024	1	2024
Development & Delivery	1	2024	1	2027
PKMA Modifications	1	2025	4	2028

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206857SF / <i>Space Rapid Capabilities Office</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	52.286	12.036	11.361	0.000	11.361	9.794	9.997	10.357	10.561	Continuing	Continuing
64A020: <i>AF Funded ORSSats</i>	-	52.286	12.036	11.361	0.000	11.361	9.794	9.997	10.357	10.561	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Space Rapid Capabilities Office (Space RCO) mission is to expedite the development and fielding of operationally focused capabilities for immediate and near term needs as directed by the Space RCO Board of Directors (BoD). Key operating principles include a short and narrow chain of command, overarching programmatic insight, early and prominent war fighter involvement, and small integrated teams within a single office to rapidly augment existing space capabilities when needed, to expand operational capability, reconstitute/replenish/protect critical space capabilities to reserve "continuity of operations" capability, and exploit space technological or operational innovations to increase U.S. advantage.

The Space RCO is ready to develop, test, train, and equip war fighter needs as they are identified at any time. First, the requirements must be validated by the commander U.S. Space Command; second, the project must be approved by the Space RCO BoD; third, the project will be executed by the Space RCO. If the effort is initiated during execution year, it will be described in the next year's budget exhibit.

Space RCO is supporting the Air Force Research Lab (AFRL) developed Space Solar Power project to collect solar energy and provide uninterrupted, assured, and logistically agile power to expeditionary forces operating in unimproved areas such as forward operating bases. AFRL formulated the Space Solar Power Incremental Demonstrations and Research (SSPIDR) project to rapidly demonstrate this innovative technology via a series of integrated demos and technology development/maturation efforts.

In addition, Space RCO will conduct studies and analyses for future programs to support the BoD.

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

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.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 1206857SF / Space Rapid Capabilities Office
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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	54.077	12.036	11.340	0.000	11.340
Current President's Budget	52.286	12.036	11.361	0.000	11.361
Total Adjustments	-1.791	0.000	0.021	0.000	0.021
• 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	-1.791	0.000	0.021	0.000	0.021

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 64A020: AF Funded ORSSats

Congressional Add: *Hyper Converged Edge Computing*

Congressional Add Subtotals for Project: 64A020

Congressional Add Totals for all Projects

	FY 2023	FY 2024
	9.000	0.000
Congressional Add Subtotals for Project: 64A020	9.000	0.000
Congressional Add Totals for all Projects	9.000	0.000

Change Summary Explanation

FY 2023: Decrease of \$1.791M due to realignment of funds to higher USSF priority.

C. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Space RCO Board of Directors (BoD) Projects, Studies, and Analysis	8.872	9.365	9.557
Description: Execute projects, studies, and analyses under rapid acquisition authorities inherent to the Space RCO, that address emergent capabilities and respond to validated requirements and other BoD approved efforts to meet needs in year of execution. In addition, provide systems engineering, program management support and civilian pay across all the Space RCO activities as well as perform modeling, simulation, analyses, and assess alternative concepts and requirements.			
FY 2024 Plans: Continue to initiate rapid acquisition projects, studies, and analyses that address emergent capabilities requirements and other Space RCO BoD approved efforts. Continue ongoing systems engineering support of future mission development. Additionally, FY 2024 funding will allow the program to rapidly respond to implement system resiliency and situational awareness necessary			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206857SF / <i>Space Rapid Capabilities Office</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
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<p>to operate in the contested space domain. Activities include, but are not limited to, program office support, studies, technical analyses, experimentation, prototyping, etc.</p> <p>FY 2025 Plans: Continue to initiate rapid acquisition projects, studies, and analyses that address emergent capabilities requirements and other Space RCO BoD approved efforts. Continue ongoing systems engineering support of future mission development. Additionally, FY 2025 funding will allow the program to rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities include, but are not limited to, program office support, studies, technical analyses, experimentation, prototyping, etc.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased due to inflation adjustment.</p>			
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<p>Title: Space RCO Solar Power</p> <p>Description: Space RCO is developing the Solar Power project to collect solar energy and provide uninterrupted, assured, and logistically agile power to expeditionary forces operating in unimproved areas such as forward operating bases.</p> <p>FY 2024 Plans: Continue developing space-based solar power collection and transmission technology via a series of integrated demos and technology development/maturation efforts: 1) continue space flight demonstration of solar-to-RF panel payload (take delivery of solar-to-RF payload emulator, validate payload for delivery, continue pre-integration of payload-to-bus), 2) deliver thermal integrated demonstration for on-orbit demonstration, 3) initiate structural operational prototype based on results from scaled array payload demonstrations and validated models, 4) update operational prototype concept designs/analysis based on tile, rectenna, thermal and structure demonstrations and updated models, and 5) continue functional demonstrations for critical technologies in energy generation, deployable structures, thermal technology, RF transmission, and distributed control.</p> <p>FY 2025 Plans: Continue developing space-based solar power collection and transmission technology via a series of integrated demos and technology development/maturation efforts: 1) continue space flight demonstration of solar-to-RF panel payload (take delivery of solar-to-RF payload emulator, validate payload for delivery, continue pre-integration of payload-to-bus), 2) deliver thermal integrated demonstration for on-orbit demonstration, 3) initiate structural operational prototype based on results from scaled array payload demonstrations and validated models, 4) update operational prototype concept designs/analysis based on tile, rectenna, thermal and structure demonstrations and updated models, and 5) continue functional demonstrations for critical technologies in</p>	34.414	2.671	1.804
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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206857SF / <i>Space Rapid Capabilities Office</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
energy generation, deployable structures, thermal technology, RF transmission, and distributed control. FY 2025 will be the last year Solar Power funding will be in this PE due to the funding being continued in AFRL PE 1206458SF.			
FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to funding (with the exception of transition funding in FY24 and FY25) being continued in AFRL PE 1206458SF.			
Accomplishments/Planned Programs Subtotals	43.286	12.036	11.361

	FY 2023	FY 2024
Congressional Add: Hyper Converged Edge Computing	9.000	0.000
FY 2023 Accomplishments: The Air Force Research Lab will execute the Hyper Converged Edge Computing project as a technology development effort with emphasis on accelerating artificial intelligence and machine learning applications in space.		
FY 2024 Plans: The Hyper Converged Edge Computing was a FY23 Congressional Add and no funding in FY24 is associated.		
Congressional Adds Subtotals	9.000	0.000

D. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

E. Acquisition Strategy

Expediently award contracts through Space RCO or partner organizations.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206857SF / <i>Space Rapid Capabilities Office</i>	Project (Number/Name) 64A020 / <i>AF Funded ORSSats</i>
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Space RCO Board of Directors (BoD) Projects, Studies, and Analysis	Various	Various : Various	-	5.078	Mar 2023	4.763	Dec 2023	4.861	Dec 2024	-		4.861	Continuing	Continuing	-
Space RCO Solar Power	SS/CPFF	Northrop Grumman : Linthicum, MD	-	34.414	Nov 2022	2.671	Nov 2023	1.804	Nov 2024	-		1.804	Continuing	Continuing	-
Hyper Converged Edge Computing	C/TBD	TBD : TBD	-	8.800	Aug 2024	-		-		-		-	Continuing	Continuing	-
Subtotal			-	48.292		7.434		6.665		-		6.665	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
FFRDC	RO	Aerospace/Sandia : Various	-	3.640	Dec 2022	4.448	Dec 2023	4.539	Dec 2024	-		4.539	Continuing	Continuing	-
A&AS	C/CPAF	Various : Various	-	0.154	Dec 2022	0.154	Dec 2023	0.157	Dec 2024	-		0.157	Continuing	Continuing	-
A&AS-Hyper Converged Edge Computing	MIPR	Various : Various	-	0.200	May 2023	-		-		-		-	Continuing	Continuing	-
Subtotal			-	3.994		4.602		4.696		-		4.696	Continuing	Continuing	N/A

			Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	52.286	12.036	11.361	-	11.361	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206857SF / <i>Space Rapid Capabilities Office</i>	Project (Number/Name) 64A020 / <i>AF Funded ORSSats</i>

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>Space Rapid Capabilities Office</i>	
Space RCO Board of Directors Projects, Studies, and Analysis	
Space RCO Solar Power	
Hyper Converged Edge Computing	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206857SF / <i>Space Rapid Capabilities Office</i>	Project (Number/Name) 64A020 / <i>AF Funded ORSSats</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Space Rapid Capabilities Office</i>				
Space RCO Board of Directors Projects, Studies, and Analysis	1	2023	4	2029
Space RCO Solar Power	1	2023	4	2025
Hyper Converged Edge Computing	3	2023	4	2025

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206862SF / <i>Tactically Responsive Space</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	0.000	30.000	30.052	0.000	30.052	0.000	0.000	0.000	0.000	0.000	60.052
643835: <i>Tactically Responsive Space (TacRS)</i>	-	0.000	30.000	30.052	0.000	30.052	0.000	0.000	0.000	0.000	0.000	60.052
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

Tactically Responsive Space (TacRS) rapidly integrates and deploys space-based end-to-end capabilities in response to Combatant Commander (CCMD) urgent needs. TacRS capabilities are planned to enter operations and generate effects within 24 hours of tasking. The near-term focus of the TacRS program (FY 2024 and FY 2025) is to establish the foundational capabilities that enable Space Domain Awareness and Combat Power (SDACP) rapid response effects based on urgent CCMD operational needs. The foundational missions enable the program to build on established capabilities, processes, concept of operations, and tactics, techniques and procedures that other mission areas may leverage to enable the 24 hour response timeline beyond the driving SDACP mission need. The other mission areas include but are not limited to surveillance, reconnaissance and tracking, and special communications.

In FY 2024, Tactically Responsive Space efforts were transferred from PE 1206862SF, Tactically Responsive Launch, Project 664235, Tactically Responsive Launch (TacRL), to the renamed PE 1206862SF, Tactically Responsive Space, Project 643835, in order to encompass the full range of responsive space.

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

This 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.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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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 1206862SF I <i>Tactically Responsive Space</i>
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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	0.000	30.000	30.000	0.000	30.000
Current President's Budget	0.000	30.000	30.052	0.000	30.052
Total Adjustments	0.000	0.000	0.052	0.000	0.052
• 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	0.052	0.000	0.052

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Title: TacRS Initial Operations and Continuous Capability Development</p> <p>Description: The TacRS program will provide initial operational capabilities starting in FY 2025. The program will leverage rapid, agile, and end-to-end acquisition processes to quickly evolve the design of future TacRS missions. This approach will enable timely integration and readiness for launch call-up, CCMD tasking, and procurement of capabilities based on current threats and priorities.</p> <p>FY 2024 Plans: TacRS effort will continue maturing, demonstrating, and stressing end-to-end tactically responsive space solutions based on lessons learned and identified pain points from the VICTUS NOX demonstration. Funding in FY 2024 supports the United States Space Force's (USSF) ability to deliver capabilities in additional mission areas, increase launch site diversity and resilience, continue to decrease response times, and serve as a pathfinder for logistics and sustainment solutions. Activities include concept design and development/acquisition of satellites, control systems, commercial capabilities and operations, technical analysis, international partnerships, launch service acquisition, prototyping, rapid rideshare services, processing, launch services support, logistics, mission assurance, operations, and tactics, techniques, and procedures, program office support, etc. for demonstration of responsive space and launch missions.</p> <p>FY 2025 Plans: Support the planned launches and operations of the two VICTUS HAZE missions that will be ready for call-up in the second quarter of FY 2025. Build on the VICTUS SOL satellite vehicle and ground investments made with prior year funding to initiate the associated responsive launch service for VICTUS SOL in FY 2025 that could enable launch in the first half of FY 2026. Begin acquisition planning efforts in FY 2025 for the future fourth VICTUS mission that will leverage lessons learned from</p>	0.000	30.000	30.052

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206862SF / <i>Tactically Responsive Space</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>previous VICTUS missions and build upon the capabilities demonstrated in VICTUS NOX (launched in 2023), VICTUS SOL, and VICTUS HAZE, where each VICTUS mission furthers the capability to launch within 24 hours of notice, match the orbital plane of a previously unknown object, and conduct rendezvous and proximity operations for inspection and characterization on an operationally relevant timeline. Continue development of an on-orbit pre-positioning demonstration to be able to support a launch in FY 2026 that would evolve response force tasking to meet Combatant Command needs within 24 hours. Support TacRS Range efforts that will provide necessary equipment and personnel to enable a responsive launch capability for all VICTUS class missions. Continue to evolve new tactically responsive space capabilities that include launch, satellites, control systems, and concept of operations using emerging and extant commercial launch and satellite providers. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p><i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> FY 2025 funding increased due to inflation.</p>			
Accomplishments/Planned Programs Subtotals	0.000	30.000	30.052

D. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u> <u>Base</u>	<u>FY 2025</u> <u>OCO</u>	<u>FY 2025</u> <u>Total</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>FY 2029</u>	<u>Cost To Complete</u> Continuing	<u>Total Cost</u> Continuing
• RDTE 06 1206862F: <i>Tactically Responsive Launch</i>	50.000	-	-	-	-	-	-	-	-		

Remarks

E. Acquisition Strategy
TacRS will utilize new and existing open competitive launch service, space vehicle, and ground operations contracts, Small Business Innovative Research contracts, Other Transaction Authority (OTA) Agreements, and other contract vehicles to take advantage of evolving commercial capabilities.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force												Date: March 2024				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
3620F / 4				PE 1206862SF / <i>Tactically Responsive Space</i>				643835 / <i>Tactically Responsive Space (TacRS)</i>								
Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
TacRS Missions	TBD	Various : Various	-	-		20.945	May 2024	25.138	Jan 2025	-		25.138	Continuing	Continuing	-	
TacRS Range Support	Various	TBD : TBD	-	-		1.900	May 2024	0.500	May 2025	-		0.500	Continuing	Continuing	-	
TacRS Tech Advance & Studies	Various	TBD : TBD	-	-		1.045	Jun 2024	0.482	Jan 2025	-		0.482	Continuing	Continuing	-	
SBIR/STTR	Allot	Not specified : TBD	-	-		1.050	Jan 2024	1.082	Oct 2024	-		1.082	Continuing	Continuing	-	
Subtotal			-	-		24.940		27.202		-		27.202	Continuing	Continuing	N/A	
Support (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
TacRS Transportation of Hardware/Personnel	PO	TMO : El Segundo, CA	-	-		0.110	Nov 2023	-		-		-	Continuing	Continuing	-	
Subtotal			-	-		0.110		-		-		-	Continuing	Continuing	N/A	
Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
TacRS Launch Service Mission Assurance	C/CPIF	ASRC Federal : Albuquerque, NM	-	-		0.850	May 2024	-		-		-	Continuing	Continuing	-	
FFRDC	RO	Various : Various	-	-		1.500	Oct 2024	1.400	Jan 2025	-		1.400	Continuing	Continuing	-	
A&AS	Various	Various : Various	-	-		2.500	Aug 2024	1.400	Jan 2025	-		1.400	Continuing	Continuing	-	
Other Support	Various	Various : El Segundo, CA	-	-		0.100	Oct 2023	0.050	Jan 2025	-		0.050	Continuing	Continuing	-	
Subtotal			-	-		4.950		2.850		-		2.850	Continuing	Continuing	N/A	
Project Cost Totals			-	-		30.000		30.052		-		30.052	Continuing	Continuing	N/A	

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force							Date: March 2024			
Appropriation/Budget Activity 3620F / 4			R-1 Program Element (Number/Name) PE 1206862SF / <i>Tactically Responsive Space</i>			Project (Number/Name) 643835 / <i>Tactically Responsive Space (TacRS)</i>				
	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract	

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206862SF / <i>Tactically Responsive Space</i>	Project (Number/Name) 643835 / <i>Tactically Responsive Space (TacRS)</i>

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>Tactically Responsive Space</i>	
TacRS Missions	████████████████████
TacRS Range Support	████████████████████
TacRS Tech Advance & Studies	████████████████████
SBIR/STTR	████████████████████

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	R-1 Program Element (Number/Name) PE 1206862SF / <i>Tactically Responsive Space</i>	Project (Number/Name) 643835 / <i>Tactically Responsive Space (TacRS)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Tactically Responsive Space</i>				
TacRS Missions	3	2024	4	2025
TacRS Range Support	1	2025	4	2025
TacRS Tech Advance & Studies	3	2024	4	2025
SBIR/STTR	3	2024	4	2025

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 1203269SF I GPS III Follow-On (GPS III F)
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	475.766	278.758	308.999	244.752	0.000	244.752	189.659	160.487	130.374	106.704	Continuing	Continuing
653170: GPS III F	475.766	232.783	247.278	181.057	0.000	181.057	124.075	93.555	61.027	35.989	115.630	1,567.160
653171: GPS Enterprise Integration	0.000	45.975	61.721	63.695	0.000	63.695	65.584	66.932	69.347	70.715	Continuing	Continuing

Program MDAP/MAIS Code: 590

A. Mission Description and Budget Item Justification

The Global Positioning System (GPS) is a space-based navigation system that fills validated Joint Service requirements for worldwide, accurate, common grid three dimensional positioning/navigation for military aircraft, ships, and ground personnel. The consistent accuracy, unaffected by location or weather and available in real time, significantly improves effectiveness of reconnaissance, weapons delivery, mine countermeasures and rapid deployment for all services. GPS must comply with Title 10 United States Code (USC) Sec. 2281, which requires that the Secretary of Defense ensures the continued sustainment and operation of GPS for military and civilian purposes, and 51 USC Sec. 50112, which requires that GPS complies with certain standards and facilitates international cooperation.

The system is composed of three segments: User Equipment (funded under Program Element (PE) 1203164F, 1203164SF), Space (funded under PE 1203165F, 1203265F, 1203265SF, 1203269F, and 1203269SF), and a Control Network (funded under PE 1206423F, 1206423SF and 1203165F). The satellites broadcast high accuracy data using precisely synchronized signals that are received and processed by user equipment installed in military and civil platforms. The user equipment computes the platform position and velocity and provides steering vectors to target locations or navigation waypoints. The control segment provides daily updates to the navigation messages broadcast from the satellites to maintain system precision in three dimensions to 16 meters (spherical error probable) worldwide. Additionally, GPS supports the United States (US) Nuclear Detonation (NUDET) Detection System (USNDS) mission and provides strategic and tactical support to the following Department of Defense (DoD) missions: Joint Operations by providing capabilities for Positioning, Navigation, and Timing (PNT); Command, Control, Communications, and Intelligence (C3I); Special Operations; Military Operations in Urban Terrain (MOUT); Defense-Wide Mission Support (DWMS); Air Mobility; and Space Launch Orbital Support.

GPS III Follow On (GPS III F) delivers improved satellites beyond the first ten GPS III Space Vehicles (SVs) being delivered (funded in PE 1203265SF GPS III Space Segment). While GPS III F satellites maintain the same capabilities as the GPS III satellites, they deliver significant enhancements to include: potential on-ramping of advanced PNT technology from efforts such as the Navigation Technology Satellite 3 (NTS-3), backward compatibility, Unified S-Band (USB) interface compliance, integration of hosted payloads including a redesigned USNDS payload, Laser Retro-reflector Arrays (LRAs), Search and Rescue/GPS (SAR/GPS), and Regional Military Protection (RMP) capabilities that provide the ability to deliver high-power regional Military Code (M-Code) signals in specific areas of intended effect.

Implementation of RMP into the GPS Enterprise requires integration with the ground and user segments, executed by the GPS Next Generation Operational Control System (OCX), along with the Military GPS User Equipment (MGUE) programs, respectively. The SAR/GPS payload provided by Canada supports Air Combat Command (ACC) and fills a validated National Search and Rescue Committee requirement to provide enduring, space-based distress alerting capability to detect,

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1203269SF / <i>GPS III Follow-On (GPS IIIIF)</i>	
<p>locate, and relay distress alerts to fulfill its responsibilities under international agreements for Search and Rescue. LRA, built by the Naval Research Lab (NRL), is a passive reflector that improves accuracy and provides better satellite ephemeris data. National Geospatial-Intelligence Agency (NGA) funds the integration costs of the LRA.</p> <p>This PE funds the Research, Development, Test, and Evaluation (RDT&E) of GPS IIIIF SVs 11-12 (to include Non-Recurring Engineering (NRE) support efforts). This program includes risk-reducing simulators and systems engineering associated with delivering the new capabilities required of GPS IIIIF satellites.</p> <p>Starting in FY 2023, this program also funds the GPS Enterprise Integration (EI) project which includes critical efforts associated with the Government's responsibility to accomplish integration of multiple prime contracts across the three GPS enterprise segments, along with the transition to sustainment and operational communities. GPS EI maintains the current GPS architecture and system definition, controls and validates interfaces, ensures compatibility across current Generation II and III systems, and ongoing developments such as GPS IIIIF space systems, OCX control systems, and MGUE Inc 1 and MGUE Inc 2 systems. GPS EI also develops/manages plans for execution and fielding of new capability like the new M-Code for use at the earliest opportunity. Further, GPS EI provides modeling, simulation, and technical analyses of impacts for Government-directed enterprise level trades among the GPS segments, leading to definition, management, maintenance, and evolution of the GPS Enterprise requirements and interface technical documents to build and ensure the integrity of the enterprise technical baseline, and perform system requirements verification.</p> <p>In addition, GPS EI funds the technical evolution, risk reduction, enterprise-level testing and delivery of all PNT Enterprise, capabilities. GPS EI also assists in the analysis and assessment of futures technology to continue the advancement of the PNT enterprise ensuring PNT capabilities continue to be at the forefront. Examples for Generation II include electronic protection; for Generation III, additional anti-jamming protection and additional civil signals. To accomplish this, GPS EI delivers Test and Verification capabilities, Requirements and Interface Management, and Systems Integration support across the Space, Control, and User Segments. In this capacity, GPS EI is responsible for managing this cross-program work to provide these and other capabilities.</p> <p>GPS EI's analyses guide Government decisions to ensure efficient and effective synchronization and execution across all GPS II and III programs. For Enterprise-wide integration to be successful, GPS EI: works with the GPS and NDS prime contractor teams to develop plans for early risk reduction System Integration Demonstrations to ensure system interfaces and functionality meet user and system requirements; ensures all equipment and documentation is ready when needed; integrates and analyzes enterprise schedules; and conducts formal test and verification, including Requirement Verification Plans and System Test Plans and Procedures. GPS EI performs all these efforts across all PNT programs in all acquisition phases. The Government owns the GPS Enterprise system requirements and integration, interfaced specifications, and highly leverages the GPS EI team to eliminate the need to fund a development prime contractor to perform these functions. This enhances Government control, oversight and program accountability.</p> <p>This program may include necessary civilian pay expenses required to manage, execute, and deliver GPS IIIIF Space Segment weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in PEs 1206392SF and 1206398SF.</p> <p>This program is in Budget Activity 5, System Development and Demonstration (SDD) because it has passed Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full rate production.</p>		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1203269SF / <i>GPS III Follow-On (GPS IIIIF)</i>
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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	292.847	308.999	254.025	0.000	254.025
Current President's Budget	278.758	308.999	244.752	0.000	244.752
Total Adjustments	-14.089	0.000	-9.273	0.000	-9.273
• 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	-3.975	0.000			
• SBIR/STTR Transfer	-10.114	0.000			
• Other Adjustments	0.000	0.000	-9.273	0.000	-9.273

Change Summary Explanation

FY 2023: -\$3.974M reprogrammed for SSPT
 FY 2025: -\$9.764M reprogrammed for higher Space Force priorities.

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1203269SF / GPS III Follow-On (GPS III F)	Project (Number/Name) 653170 / GPS III F
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
653170: GPS III F	475.766	232.783	247.278	181.057	0.000	181.057	124.075	93.555	61.027	35.989	115.630	1,567.160
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Global Positioning System (GPS) is a space-based navigation system that fills validated Joint Service requirements for worldwide, accurate, common grid three dimensional positioning/navigation for military aircraft, ships, and ground personnel. The consistent accuracy, unaffected by location or weather and available in real time, significantly improves effectiveness of reconnaissance, weapons delivery, mine countermeasures and rapid deployment for all services. GPS must comply with Title 10 United States Code (USC) Sec. 2281, which requires that the Secretary of Defense ensures the continued sustainment and operation of GPS for military and civilian purposes, and 51 USC Sec. 50112, which requires that GPS complies with certain standards and facilitates international cooperation.

The system is composed of three segments: User Equipment (funded under Program Element (PE) 1203164F, 1203164SF), Space (funded under PE 1203165F, 1203265F, 1203265SF, 1203269F, and 1203269SF), and a Control Network (funded under PE 1206423F, 1206423SF and 1203165F). The satellites broadcast high accuracy data using precisely synchronized signals that are received and processed by user equipment installed in military platforms. The user equipment computes the platform position and velocity and provides steering vectors to target locations or navigation waypoints. The control segment provides daily updates to the navigation messages broadcast from the satellites to maintain system precision in three dimensions to 16 meters (spherical error probable) worldwide. Additionally, GPS supports the United States (US) Nuclear Detonation (NUDET) Detection System (USNDS) mission and provides strategic and tactical support to the following Department of Defense (DoD) missions: Joint Operations by providing capabilities for Positioning, Navigation, and Timing (PNT); Command, Control, Communications, and Intelligence (C3I); Special Operations; Military Operations in Urban Terrain (MOUT); Defense-Wide Mission Support (DWMS); Air Mobility; and Space Launch Orbital Support.

GPS III Follow On (GPS III F) delivers improved satellites beyond the first ten GPS III Space Vehicles (SVs) being delivered (funded in PE 1203265SF GPS III Space Segment). While GPS III F satellites maintain the same capabilities as the GPS III satellites, they deliver significant enhancements to include: potential on-ramping of advanced PNT technology from efforts such as the Navigation Technology Satellite 3 (NTS-3), backward compatibility, Unified S-Band (USB) interface compliance, integration of hosted payloads including a redesigned USNDS payload, Laser Retro-reflector Arrays (LRAs), Search and Rescue/GPS (SAR/GPS), and Regional Military Protection (RMP) capabilities that provide the ability to deliver high-power regional Military Code (M-Code) signals in specific areas of intended effect.

Implementation of RMP into the GPS Enterprise requires integration with the ground and user segments, executed by the GPS Next Generation Operational Control System (OCX), along with the Military GPS User Equipment (MGUE) programs, respectively. The SAR/GPS payload provided by Canada fills a validated National Search and Rescue Committee requirement to provide enduring, space-based distress alerting capability to detect, locate, and relay distress alerts to fulfill its responsibilities under international agreements for Search and Rescue. LRA, built by the Naval Research Lab (NRL), is a passive reflector that improves accuracy and provides better ephemeris data. National Geospatial-Intelligence Agency (NGA) funds the integration costs of the LRA.

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1203269SF / GPS III Follow-On (GPS III F)	Project (Number/Name) 653170 / GPS III F
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This PE funds the Research, Development, Test, and Evaluation (RDT&E) of GPS III F SVs 11-12 (to include Non-Recurring Engineering (NRE) support efforts). This program includes risk-reducing simulators (GPS Software and Simulator (GSS+ 1 & 2), (GPS Non-flight Satellite Test Bed (GNST+)) and systems engineering associated with delivering the new capabilities required of GPS III F satellites.

Starting in FY 2023, this program also funds the GPS Enterprise Integration (EI) project which includes critical efforts associated with the Government's responsibility to accomplish integration of multiple prime contracts across the three GPS enterprise segments, along with the transition to sustainment and operational communities. GPS EI maintains the current GPS architecture and system definition, controls and validates interfaces, ensures compatibility across current Generation II and III systems, and ongoing developments such as GPS III F space systems, OCX control systems, and MGUE Inc 1 and MGUE Inc 2 systems. GPS EI also develops/ manages plans for execution and fielding of new capability like the new M-Code for use at the earliest opportunity. Further, GPS EI provides modeling, simulation, and technical analyses of impacts for Government-directed enterprise level trades among the GPS segments, leading to definition, management, maintenance, and evolution of the GPS Enterprise requirements and interface technical documents to build and ensure the integrity of the enterprise technical baseline, and perform system requirements verification.

In addition, GPS EI funds the technical evolution, risk reduction, enterprise-level testing and delivery of all PNT Enterprise capabilities. GPS EI also assists in the analysis and assessment of futures technology to continue the advancement of the PNT enterprise ensuring PNT capabilities continue to be at the forefront. Examples for Generation II included electronic protection; for Generation III, additional anti-jamming protection and additional civil signals. To accomplish this, GPS EI delivers Test and Verification capabilities, Requirements and Interface Management, and Systems Integration support across the Space, Control, and User Segments. In this capacity, GPS EI is responsible for managing this cross-program work to provide these and other capabilities.

GPS EI's analyses guide Government decisions to ensure efficient and effective synchronization and execution across all GPS II and III programs. For Enterprise-wide integration to be successful, GPS EI works with the GPS and NDS prime contractor teams to develop plans for early risk reduction System Integration Demonstrations to ensure system interfaces and functionality meet user and system requirements; ensures all equipment and documentation is ready when needed; integrates and analyzes enterprise schedules; and conducts formal test and verification, including Requirement Verification Plans and System Test Plans and Procedures. GPS EI performs all these efforts across all PNT programs in all acquisition phases. The Government owns the GPS Enterprise system requirements and integration, and interfaced specifications, and highly leverages the GPS EI team to eliminate the need to fund a development prime contractor to perform these functions. This enhances Government control, oversight and program accountability.

This program may include necessary civilian pay expenses required to manage, execute, and deliver GPS III F Space Segment weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in PEs 1206392SF and 1206398SF.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: GPS III Follow-On (GPS III F) Development	232.783	247.278	181.057
Description: The program utilizes RDT&E funds to develop and deliver space vehicles (SVs) 11-12, conduct the Non-recurring Engineering (NRE) of developing risk-reducing simulators (Global Positioning System (GPS) Software and Simulator (GSS+ 1 & 2), (GPS Non-flight Satellite Test Bed (GNST+)), developing support test equipment, and conducting the systems engineering			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1203269SF / GPS III Follow-On (GPS III F)	Project (Number/Name) 653170 / GPS IIIIF

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>associated with delivering the new capabilities required of GPS IIIIF including backward compatibility, dual band Telemetry, Tracking, and Control, integration of Government Furnished Equipment hosted payloads, and Regional Military Protection (RMP), which delivers high power regional Military-Code (M-Code) signals in specific areas of intended effect.</p> <p>FY 2024 Plans: Complete integration of GNST+. Complete test and transfer of GSS+ 1. Complete build, test and qualification of GSS+ 2. NTS-3 is scheduled to launch at the end of FY 2023. FY 2024 funds will be dedicated to early on orbit checkout and feed into 1 year of preplanned experiments (scheduled to end FY24). Continue development of SV-11, to include receipt of Mission Data Units, Testing and Core mate, and acoustic testing. Begin development of SV-12, to include initial delivery of System Module Hardware, receipt of Mission Data Units, and Testing and Core mate. Continue support capability insertion research, and perform risk reduction activities on the Common Bus approach for SVs 13+. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but not limited to, program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p>FY 2025 Plans: Continue development of GPS IIIIF SV11 and SV12. Planned activities for SV11 and SV12 include; initiate and/or complete Thermal Vacuum Test (TVAC), conduct SV Acoustic testing, conduct Passive Inter-Modulation Testing (PIM), Electromagnetic Interference (EMI), and TEMPEST testing. Continue Non-Recurring Engineering (NRE) work to include studying and executing crosslink and Space Domain Awareness (SDA) opportunities. Delivery and acceptance testing of both risk-reducing simulators (GPS Software and Simulator (GSS+1 and GSS+2). Continue on-going technical mission analysis necessary for satellite development and program critical path. Continue support capability insertion research, and support required Software Development. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to reduction of development activities for GPS IIIIF with completion of GNST+.</p>			
Accomplishments/Planned Programs Subtotals	232.783	247.278	181.057

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
• SPSF 01 BA01 GPS03C: <i>GPSIII Follow On</i>	607.596	118.916	665.861	-	665.861	708.625	742.874	758.456	773.494	1,358.809	5,734.631

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1203269SF / GPS III Follow-On (GPS III F)	Project (Number/Name) 653170 / GPS III F

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u> <u>Base</u>	<u>FY 2025</u> <u>OCO</u>	<u>FY 2025</u> <u>Total</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>FY 2029</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
Remarks											

D. Acquisition Strategy

In December 2017, Principal Deputy Office of the Assistant Secretary of the Air Force Acquisition & Logistics began the GPS III F program. Beginning in FY 2019 and, consistent with the Fiscal Year 2016 National Defense Authorization Act, the program was categorized as an Acquisition Category 1B Major Defense Acquisition Program (MDAP) with the Service Acquisition Executive serving as the Milestone Decision Authority (MDA). During this time, the MDA approved the second phase of the two-phased GPS III Follow-On acquisition strategy. Executed using funds in PE 1203265F, GPS III Space Segment, the Phase 1 Production Readiness Feasibility Assessments conducted during FY 2016-2017 provided data and insight into contractors' GPS satellite production designs with emphasis on a mature navigation payload and production-ready designs. Phase 1 results affirmed the viability of a competitive approach for Phase 2. The Phase 2 strategy directed the Air Force to conduct a full-and-open competition for GPS III F space vehicles and specified the use of RDT&E funds to deliver SVs 11-12 and conduct associated NRE.

In addition to SVs 11-12, the RDT&E effort is comprised of developing risk-reducing simulators (GPS Software and Simulator (GSS+), (GPS Non-flight Satellite Test Bed (GNST+)), support test equipment, and conducting the systems engineering associated with delivering the new capabilities required of GPS III F. The Air Force awarded the contract to Lockheed Martin in September 2018 and began the 1-year Critical Design Review (CDR) campaign in March 2019. Completion of CDR was done in March 2020 and Milestone C production certification completed in July 2020. Procurement of SVs 13 and 14 awarded on October 7, 2020. Procurement of SVs 15-17 awarded on October 22, 2021. GPS III F SVs 18, 19, and 20 were awarded on October 27, 2022. The Space Force will continue to procure future GPS III F satellites via annual contract options exercised using Procurement, Space Force funds consistent with full-funding policy under an annual buy approach.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force												Date: March 2024			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
3620F / 5				PE 1203269SF / GPS III Follow-On (GPS III F)				653170 / GPS III F							
Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
GPS III F Development	C/FPIF	Lockheed Martin : Littleton, CO	428.431	211.708	Oct 2022	206.414	Oct 2023	155.911	Oct 2024	-		155.911	361.467	1,363.931	1,374.851
NTS-3 Payload and Launch	Various	Various : Various, CA	19.233	2.299	Mar 2023	5.203	Mar 2024	0.887	Mar 2025	-		0.887	0.000	27.622	-
GPS III F SBIR/STTR	Various	Various : Various, CA	0.000	0.000		8.616	Nov 2023	6.518	Nov 2024	-		6.518	16.469	31.603	-
GPS III F Technical Mission Analysis	Various	Aerospace : El Segundo, CA	7.133	2.572	Nov 2022	6.077	Nov 2023	1.313	Nov 2024	-		1.313	3.407	20.502	-
GPS III F Enterprise SE&I	C/CPAF	SAIC : El Segundo, CA	3.866	3.979	Nov 2022	6.443	Nov 2023	4.123	Nov 2024	-		4.123	17.827	36.238	-
Subtotal			458.663	220.558		232.753		168.752		-		168.752	399.170	1,479.896	N/A
Test and Evaluation (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
GPS III F Test and Evaluation	Various	Various : Various	1.000	-		-		-		-		-	0.000	1.000	-
Subtotal			1.000	-		-		-		-		-	0.000	1.000	N/A
Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
GPS III F FFRDC	Various	Aerospace : El Segundo, CA	3.619	1.115	Nov 2022	2.840	Nov 2023	2.263	Nov 2024	-		2.263	10.390	20.227	-
GPS III F A&AS	Various	Various : Various, CA	11.817	10.660	Nov 2022	11.385	Nov 2023	9.742	Nov 2024	-		9.742	19.216	62.820	-
GPS III F Other Support	Various	Various : El Segundo, CA	0.667	0.450	Nov 2022	0.300	Nov 2023	0.300	Nov 2024	-		0.300	1.500	3.217	-
Subtotal			16.103	12.225		14.525		12.305		-		12.305	31.106	86.264	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force							Date: March 2024				
Appropriation/Budget Activity 3620F / 5			R-1 Program Element (Number/Name) PE 1203269SF / GPS III Follow-On (GPS III F)			Project (Number/Name) 653170 / GPS IIIIF					
	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals	475.766	232.783	247.278	181.057	-	181.057	430.276	1,567.160	N/A		

Remarks
 FINANCIAL PERFORMANCE:GPS IIIIF is evaluated against traditional Research and Development (R&D) program expenditure benchmarks. Unlike many traditional R&D programs, however, the GPS IIIIF Development contract is a FPIF contract with progress payments. 10 percent of incurred costs are withheld until the end of the contract, when they are liquidated. Mandatory funding obligations and progress payment withholds will cause the program to lag traditional expenditure benchmarks, painting an inaccurate portrait of overall program execution health.

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1203269SF / GPS III Follow-On (GPS III F)	Project (Number/Name) 653170 / GPS III F
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FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

GNST+	
GNST+ Integration	
GSS+	
GSS+ 1 & 2 Integration	
GSS+ 1 Delivered	
GSS+ 2 Delivered	
GPS III F	
SV11 Subsystem Development, Procurement & Build	
SV11 System Integration & Test	
SV11 Available for Launch	
SV 11 Launch	
SV 11 Early Orbit Operations and On Orbit Checkout	
SV12 Subsystem Development, Procurement & Build	
SV12 System Integration & Test	
SV12 Available for Launch	
SV 12 Launch	
SV 12 Early Orbit Operations and On Orbit Checkout	
GPS III F Advanced Capabilities Development	
Navigation Technology Satellite-3 (NTS-3)	
NTS-3 Payload and Launch	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1203269SF / GPS III Follow-On (GPS III F)	Project (Number/Name) 653170 / GPS III F

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
GNST+				
GNST+ Integration	1	2023	1	2024
GSS+				
GSS+ 1 & 2 Integration	1	2023	2	2024
GSS+ 1 Delivered	3	2024	1	2025
GSS+ 2 Delivered	4	2025	4	2025
GPS III F				
SV11 Subsystem Development, Procurement & Build	3	2023	3	2023
SV11 System Integration & Test	1	2023	1	2026
SV11 Available for Launch	1	2027	1	2027
SV 11 Launch	1	2027	1	2027
SV 11 Early Orbit Operations and On Orbit Checkout	1	2027	4	2027
SV12 Subsystem Development, Procurement & Build	1	2023	3	2023
SV12 System Integration & Test	3	2023	2	2026
SV12 Available for Launch	3	2027	3	2027
SV 12 Launch	3	2027	3	2027
SV 12 Early Orbit Operations and On Orbit Checkout	4	2027	4	2028
GPS III F Advanced Capabilities Development	1	2023	4	2027
Navigation Technology Satellite-3 (NTS-3)				
NTS-3 Payload and Launch	2	2024	2	2026

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 5					R-1 Program Element (Number/Name) PE 1203269SF / GPS III Follow-On (GPS III F)				Project (Number/Name) 653171 / GPS Enterprise Integration			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
653171: <i>GPS Enterprise Integration</i>	0.000	45.975	61.721	63.695	0.000	63.695	65.584	66.932	69.347	70.715	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Global Positioning System (GPS) Program Office established and maintains the technical baseline and is responsible for the successful fielding of all the GPS Segments (space, control, and user). In order to successfully execute these responsibilities, GPS Enterprise Integrator (EI) creates an enterprise architecture, integrates segment products, verifies the enterprise requirements are adequately met, develops and implements various Systems Engineering documents, defines methods of verification, conducts integrated system test and test analysis, develops and manages the Enterprise technical baseline which reflect multiple stakeholder requirements; stakeholders include the Department of Defense (DoD), foreign governments, industry, and the general public (through four public interface specifications). Furthermore, GPS EI ensures PNT capabilities meet the warfighter's, civil agencies, commercial entities, international treaties, and over four billion global GPS users needs. Moreover, GPS EI is responsible for delivering a reliable Positioning, Navigation, and Timing (PNT) signal capability to military operators, the civil user community, and international partners. In addition, GPS EI validates the system performance in various mission threat scenarios during its development as well as provides in-depth technical expertise to enhance government control, oversight and program accountability. GPS EI is also responsible for all aspects of schedule and technical alignment across the GPS segments (space, control, and user equipment).

More specifically, GPS EI is responsible for technical baseline management, integration, synchronizing, testing, and verifying GPS III, GPS III Follow-on (IIIF), Operational Control System (OCS), Next Generation Operational Control System (OCX), Military GPS User Equipment (MGUE) Increment (Inc) 1 and Inc 2, and other PNT investment projects. Additionally, GPS EI is responsible for creating and managing plans that provide early exercise of the products under development, compatibility analysis, and inter-segment testing. The inter-segment tests are required to prove OCX interoperability with GPS III satellites and Modernized User Equipment. More importantly, it ensures backwards compatibility with legacy systems such as GPS Block II satellites, OCS, and legacy user equipment. The GPS EI also manages the process through which the Joint Requirements Oversight Council validated requirements are matured and flowed down to the system segments, while remaining consistent with various interfaces. This enables the GPS system to meet Title 10 of the USC, Sec 2281, mandated PNT capabilities, and various other obligations to the international community that provide inter-operable PNT signals.

GPS EI also supports GPS spectrum protection at international forums such as the International Telecommunications Union. Such support consists of providing technical support to the Departments of State and Defense to advocate on behalf of the US Government when negotiating with foreign partners. In addition, GPS EI provides technical expertise to maintain relationships with other US government agencies that include the Federal Aviation Administration, National Geospatial-Intelligence Agency (NGA), National Aeronautics and Space Administration, and Departments of State, Transportation, Homeland Security, and Commerce. GPS EI Spectrum also ensures GPS priority for eight essential spectrum signals, including those required for civil air navigation and safety of life. Spectrum Protection prevents encroachment from commercial or foreign entities, which results in the preservation of warfighter's reliable signal. As a result, military operations and the integrity of the global economic infrastructure are protected.

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1203269SF / GPS III Follow-On (GPS III F)	Project (Number/Name) 653171 / GPS Enterprise Integration
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GPS EI also manages GPS and other navigation system performance monitoring and publishes performance specifications and reports to ensure anomalies with GPS can be resolved. In addition, GPS EI provides technical expertise for the development for GPS program technical baselines and public specifications to make certain that the DoD fulfills its commitment to the world for civilian GPS Service.

GPS EI also provides the PNT enterprise expertise in Enterprise Schedule Management, Risk Management, System Safety, Enterprise level System Security Engineering covering Acquisition Systems Program Security (i.e., personnel, industrial, operations, information, sensitive compartmented information, communication, and physical), Program Protection, Foreign Disclosure, Public Release reviews, Mission System Certification and Accreditation, and Enterprise Cybersecurity. GPS EI is accountable for the development, execution, and analysis of the PNT Enterprise Segments, cybersecurity, and associated test cases necessary to deliver a secure operational system.

GPS EI will support a range of future Positioning, Navigation, and Timing (PNT) initiatives to include program planning and strategies, technology assessments, PNT innovation initiatives, systems engineering, approach to integrating new capabilities into the current GPS Enterprise, and other related activities. Future PNT development initiatives will be strongly influenced by modeling and analysis currently in development by the Space Warfighting Analysis Center (SWAC). This could include a broad range of innovations such as enhancements to Military GPS User Equipment (MGUE), creative distribution of Timing, PNT signal situational awareness, advanced payloads, optical crosslinks, or future proliferated GPS spacecraft.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
<p>Title: Enterprise Integration</p> <p>Description: Funding supports the integration and technical baseline control of all elements of the Global Positioning System (GPS) system (space/control/user) in support of both military and civil users. Test and verification of integrated system performance in preparation for operational test and evaluation.</p> <p>FY 2024 Plans: Continue integrated, Government-led development and operational testing using operational assets, facilities and resources. Support MGUE Inc 2 MSI with Next Generation ASIC prototyping. Support MGUE Handheld program and requirements review. Continue GPS Enterprise-wide systems engineering, systems integration, and technical baseline management to ensure GPS Programs of Record work effectively together.</p> <p>Support GPS III SV09-10 delivery, launch planning and integration. Support integration planning for OCX 3F and GPS III F SVs. Evaluate systems for effectiveness in delivering capabilities of GPS Constellation Management, GPS Enterprise M-Code PNT Determination, GPS L2C signal PNT Determination, and GPS L5 signal PNT Determination. Support operational demonstration of Vanguard NTS-3 program and acquisition planning for selected technology for transition to operational systems. Work with US Civil Partners to develop and assess future GPS opportunities.</p> <p>Provide increased support for PNT cybersecurity including cyber survivability test and evaluation planning and analysis.</p>	45.975	61.721	63.695

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1203269SF / GPS III Follow-On (GPS III F)	Project (Number/Name) 653171 / GPS Enterprise Integration

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but not limited to: program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p>FY 2025 Plans: Continue integrated, Government-led development and operational testing using operational assets, facilities and resources. Support MGUE Inc 1 completion of Aviation/Maritime lead platform testing. Support MGUE Inc 2 MSI with Next Generation ASIC prototyping, including MGUE Inc 2 first article delivery. Support MGUE Handheld program and requirements review. Support OCX Block 1/2 Ready to transition to Operations (RTO) and Constellation Transfer (CTX) from the OCS to OCX. Continue GPS Enterprise-wide systems engineering, systems integration, and technical baseline management to ensure GPS Programs of Record work effectively together.</p> <p>Support GPS III SV08-10 launch. Support integration planning for OCX 3F and GPS III F SVs. Evaluate systems for effectiveness in delivering capabilities of GPS Constellation Management, GPS Enterprise M-Code PNT Determination, GPS L2C signal PNT Determination, and GPS L5 signal PNT Determination. Support operational demonstration of Vanguard NTS-3 program and acquisition planning for selected technology for transition to operational systems. Work with US Civil Partners to develop and assess future GPS opportunities.</p> <p>Provide increased support for PNT cybersecurity including cyber survivability test and evaluation planning and analysis.</p> <p>Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased due to increasing enterprise-wide activities to support simultaneous GPS milestones.</p>			
Accomplishments/Planned Programs Subtotals	45.975	61.721	63.695

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u> <u>Base</u>	<u>FY 2025</u> <u>OCO</u>	<u>FY 2025</u> <u>Total</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>FY 2029</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• RDTE 07 1206423F: <i>Global Positioning System III - Operational Control Segment</i>	277.052	317.309	169.304	-	169.304	22.830	6.614	6.853	6.989	0.000	806.951

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024	
Appropriation/Budget Activity 3620F / 5				R-1 Program Element (Number/Name) PE 1203269SF / GPS III Follow-On (GPS III F)				Project (Number/Name) 653171 / GPS Enterprise Integration			

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2023	FY 2024	FY 2025	FY 2025	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	Cost To		
			Base	OCO	Total					Complete	Total Cost	
• RDTE 04 1203164F: NAVSTAR Global Positioning System (User Equipment) (SPACE)	381.394	353.807	299.424	-	299.424	133.805	0.000	0.000	0.000	0.000	0.000	1,168.430
• RDTE 07 1203265F: GPS III Space Segment	1.526	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.526
• RDTE 05 1203269SF: GPS III Follow-On (GPS III F)	220.942	247.278	180.694	-	180.694	123.831	93.356	60.900	35.919	142.362	1,105.282	
• SPSF 01 GPSIII: GPS III Space Segment	103.340	121.770	68.072	-	68.072	29.665	2.808	0.000	0.000	0.000	325.655	
• SPSF 01 GPS03C: GPSIII Follow On	607.596	119.700	665.861	-	665.861	708.862	742.874	758.456	773.494	1,358.809	5,735.652	

Remarks

D. Acquisition Strategy

In accordance with a "back to basics" acquisition approach the Space Force is required to exercise complete ownership of the architecture, system definition, technical baseline, and integration of the GPS space, ground, and user segments. This complex inter-segment integration requires the government to be the integrator. To execute this responsibility, the government leverages systems engineering and integration expertise from both Federally Funded Research and Development Center (FFRDC) contractors and a Systems Engineering & Integration (SE&I) contractor. The GPS EI function of the SE&I contractor is currently funded within this PE. SE&I effort was awarded in April 2022 through a full and open competition, following a sole source SE&I Bridge Contract that began in 1QFY22.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1203269SF / GPS III Follow-On (GPS III F)	Project (Number/Name) 653171 / GPS Enterprise Integration
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
GPS EI Enterprise SE&I	RO	SAIC : El Segundo, CA	0.000	16.965	Nov 2022	27.294	Nov 2023	32.069	Nov 2024	-		32.069	Continuing	Continuing	-
GPS EI Technical Mission Analysis 1	RO	Aerospace : El Segundo, CA	0.000	5.559	Oct 2022	5.605	Oct 2023	3.270	Oct 2024	-		3.270	Continuing	Continuing	-
GPS EI Technical Mission Analysis 2	Various	Mitre : Various	0.000	10.470	Oct 2022	13.684	Oct 2023	11.350	Oct 2024	-		11.350	Continuing	Continuing	-
GPS EI SBIR/STTR	Various	Various : Washington, DC	0.000	0.000		2.151	Mar 2024	2.293	Mar 2025	-		2.293	Continuing	Continuing	-
GPS EI Additional Product Development	Various	Various : Various	0.000	2.336	Oct 2022	1.486	Oct 2023	3.336	Dec 2024	-		3.336	Continuing	Continuing	-
Subtotal			0.000	35.330		50.220		52.318		-		52.318	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
GPS EI Integrated System Test	Various	Various : TBD	0.000	4.154	Dec 2023	4.400	Dec 2023	5.000	Dec 2024	-		5.000	Continuing	Continuing	-
GPS EI GPS Test Asset Program (GTAP)	C/CPAF	Draper Labs : Cambridge, MA	0.000	5.800	Jan 2023	5.637	Dec 2023	5.711	Dec 2024	-		5.711	Continuing	Continuing	-
Subtotal			0.000	9.954		10.037		10.711		-		10.711	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
GPS EI A&AS	Various	Various : El Segundo, CA	0.000	0.291	Oct 2022	1.064	Oct 2023	0.266	Oct 2024	-		0.266	Continuing	Continuing	-
GPS EI Other Support	Various	Various : Various	0.000	0.400	Oct 2022	0.400	Oct 2023	0.400	Oct 2024	-		0.400	Continuing	Continuing	-
Subtotal			0.000	0.691		1.464		0.666		-		0.666	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force								Date: March 2024					
Appropriation/Budget Activity 3620F / 5				R-1 Program Element (Number/Name) PE 1203269SF / GPS III Follow-On (GPS III F)				Project (Number/Name) 653171 / GPS Enterprise Integration					
	Prior Years	FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	45.975		61.721		63.695		-		63.695	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1203269SF / GPS III Follow-On (GPS III F)	Project (Number/Name) 653171 / GPS Enterprise Integration

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Support GPS III and GPS IIIIF AFL	
GPS III SV09 Available for Launch	
GPS III SV10 Available for Launch	
GPS IIIIF SV11 Available for Launch	
GPS IIIIF SV12 Available for Launch	
GPS IIIIF SV13 Available for Launch	
GPS IIIIF SV14 Available for Launch	
Enterprise Integration Support	
Mission Integration and Technical Baseline Management	
OCX Block 1 Ready to Transition to Operations (RTO)	
M-Code, L5 and L2C Initial Operational Capability (IOC)	
M-Code PNT IOC	
OCX 3F Operational Acceptance	
Constellation Management Full Operational Capability	
L5 PNT Full Operational Capability	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1203269SF / GPS III Follow-On (GPS III F)	Project (Number/Name) 653171 / GPS Enterprise Integration

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Support GPS III and GPS III F AFL				
GPS III SV09 Available for Launch	1	2023	1	2023
GPS III SV10 Available for Launch	3	2023	3	2023
GPS III F SV11 Available for Launch	1	2027	1	2027
GPS III F SV12 Available for Launch	3	2027	3	2027
GPS III F SV13 Available for Launch	2	2028	2	2028
GPS III F SV14 Available for Launch	4	2028	4	2028
Enterprise Integration Support				
Mission Integration and Technical Baseline Management	1	2023	4	2029
OCX Block 1 Ready to Transition to Operations (RTO)	2	2025	2	2025
M-Code, L5 and L2C Initial Operational Capability (IOC)	3	2024	3	2024
M-Code PNT IOC	4	2025	4	2025
OCX 3F Operational Acceptance	1	2028	1	2028
Constellation Management Full Operational Capability	1	2028	1	2028
L5 PNT Full Operational Capability	1	2028	1	2028

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1203940SF / <i>Space Situation Awareness Operations</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	55.517	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	55.517
65A037: <i>Ground Based Optical Sensor</i>	-	55.517	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	55.517
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

Space Domain Awareness (SDA) is one of five core competencies of the Space Force and is the effective identification, characterization, and understanding of any factor, passive or active, associated with the space domain that could affect space operations and thereby impact the security, safety, economy, or environment of our nation. As the foundation for space control, SDA encompasses surveillance of all space objects and activities; detailed surveillance of specific space assets; monitoring space environmental conditions; monitoring cooperative space assets; gathering indications and warning on adversary space operations; and conducting integrated command, control, communications, processing, analysis, dissemination, and archiving activities.

This program element fields, upgrades, operationalizes, operates and maintains Space Force sensors and information integration capabilities within the SDA network while companion program element 1206425SF, Space Situational Awareness Systems, develops new network sensors and improved information integration capabilities across the network. Activities funded in this program element (1203940SF) focus on surveillance of objects in earth orbit to aid tasks including satellite tracking; space object identification; tracking and cataloging; satellite attack warning; notification of satellite flyovers to U.S. forces; space treaty monitoring; and technical intelligence gathering.

The Ground-Based Optical Sensor System (GBOSS) Program is an upgrade to the Ground-based Electro-Optical Deep Space Surveillance (GEODSS) system that enables GEODSS to monitor small, closely-spaced, and advanced threats in low, mid, high, and geostationary orbits. The upgraded system will discover currently undetectable space threats, reduce an adversary's tactical surprise and deliver the data required to support accurate, timely, actionable SDA. This facilitates decision-making within the compressed timelines dictated by the realities of the congested, contested, competitive space domain. The program delivers a combination of performance upgrades to existing GEODSS sites, including advanced data exploitation and rapid data dissemination, and will incorporate coalition data, commercial data and/or new GEODSS sites to provide a global capability to positively ID an adversary committing an orbital attack. The program includes updates to the GEODSS image processing and optical subsystems that will enhance the sensitivity and search rate, and fields new multi-spectral advanced technology sensors supporting extended operations, high-fidelity characterization, enhanced indications and warnings (I&W), and attribution.

In FY 2024, Ground Based Optical Sensor efforts were transferred to PE 1206425SF, Space Situation Awareness Systems, Project 65A037, Ground Based Optical Sensor, in order to align it with other developmental SDA programs.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1203940SF / <i>Space Situation Awareness Operations</i>
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This program is in Budget Activity 5, System Development and Demonstration (SDD) because it has passed Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full rate production.

B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	57.478	0.000	0.000	0.000	0.000
Current President's Budget	55.517	0.000	0.000	0.000	0.000
Total Adjustments	-1.961	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	-1.961	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 65A037: *Ground Based Optical Sensor*

Congressional Add: *Artificial Intelligence and Autonomy for Data Analytics and Sensor Systems*

Congressional Add Subtotals for Project: 65A037

Congressional Add Totals for all Projects

	FY 2023	FY 2024
	7.727	-
	7.727	-
	7.727	-

C. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Ground Based Optical Sensor System (GBOSS)	47.790	0.000	0.000
Description: GBOSS provides a global, ground-based, optical sensor capability for Space Domain Awareness (SDA). The program implements advanced capabilities that may leverage coalition data, commercial data, and sophisticated exploitation algorithms to enhance system response and resiliency to operate in the contested space domain based on aggressive threats by our pacing-competitors, China and Russia. GBOSS improves sensitivity, search rate, tracking of non-cooperative launches, precise tagging of clustered objects, detection of closely spaced dim objects, attribution of orbital attackers and delivers foundational technology to support data exploitation for advanced indications and warnings. This effort includes upgrading existing sensors, dissemination of all data to DoD and IC stakeholders via the Unified Data Library (UDL), and may field GBOSS-enhanced GEODSS capabilities to new locations in accordance with USSF Leadership direction. The program will also acquire			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1203940SF / <i>Space Situation Awareness Operations</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
new advanced technology sensors to improve persistence and advanced multi-spectral data collection, enabling high-fidelity characterization and rapid attribution. The program will collaborate with Combined Space Operations Center (CSpOC), National Space Defense Center (NSDC), and National Air and Space Intelligence Center (NASIC) efforts to ensure enterprise data fusion and dissemination supporting Enterprise Space Battle Management Command, and Control (ESBMC2).			
FY 2024 Plans: N/A			
FY 2025 Plans: N/A			
FY 2024 to FY 2025 Increase/Decrease Statement: N/A			
Accomplishments/Planned Programs Subtotals	47.790	0.000	0.000

	FY 2023	FY 2024
Congressional Add: Artificial Intelligence and Autonomy for Data Analytics and Sensor Systems	7.727	-
FY 2023 Accomplishments: This effort will develop and demonstrate a prototype of a distributed Artificial Intelligence-driven autonomous SDA sensor management system and associated modular hosting system.		
Congressional Adds Subtotals	7.727	-

D. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

E. Acquisition Strategy

This program began in FY 2018 to address ground-based optical SDA gaps and shortfalls. The acquisition strategy, approved in March 2018, accelerates the development and fielding of the solution, minimizing the time to address the requirements in light of current and emerging threats. Initial TMRR activities were executed using existing defense, intelligence, and lab contracts. EMD activities are being executed on the Maintenance of Space Situational Awareness Integrated Capabilities (MOSSAIC) contract awarded through full and open competition.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1203940SF / <i>Space Situation Awareness Operations</i>	Project (Number/Name) 65A037 / <i>Ground Based Optical Sensors</i>
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
GBOSS design, development and life extension	Various	L3Harris : Colorado Springs, CO	-	31.435	Nov 2022	-		-		-		-	0.000	31.435	-
GBOSS Test and Training, Materials Development	C/CPIF	Various : Various	-	7.029	Nov 2022	-		-		-		-	0.000	7.029	-
GBOSS Technical Mission Analysis	RO	Various : Various	-	4.401	Nov 2022	-		-		-		-	0.000	4.401	-
GBOSS AI and Autonomy for Data Analytics and Sensor Systems	Various	Various : Various	-	7.727	Apr 2023	-		-		-		-	0.000	7.727	-
Subtotal			-	50.592		-		-		-		-	0.000	50.592	N/A

Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
A&AS	Various	Various : Various	-	2.800	Nov 2022	-		-		-		-	0.000	2.800	-
FFRDC	Various	Various : Various	-	2.000	Nov 2022	-		-		-		-	0.000	2.000	-
Other Support	C/CPAF	Various : Various	-	0.125	Nov 2022	-		-		-		-	0.000	0.125	-
Subtotal			-	4.925		-		-		-		-	0.000	4.925	N/A

	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		-	55.517	-	-	-	0.000	55.517	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1203940SF / <i>Space Situation Awareness Operations</i>	Project (Number/Name) 65A037 / <i>Ground Based Optical Sensors Operations</i>

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

GBOSS EMD	
GBOSS EMD	
AI & Autonomy	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1203940SF / <i>Space Situation Awareness Operations</i>	Project (Number/Name) 65A037 / <i>Ground Based Optical Sensors Operations</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
GBOSS EMD				
GBOSS EMD	1	2023	4	2023
AI & Autonomy	3	2023	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206421SF / <i>Counterspace Systems</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	32.683	36.537	37.078	0.000	37.078	37.385	38.155	39.532	40.313	Continuing	Continuing
65A001: <i>Counter Satellite Communications System</i>	-	20.666	34.382	34.877	0.000	34.877	35.132	35.855	37.149	37.882	Continuing	Continuing
65A013: <i>BOUNTY HUNTER</i>	-	12.017	2.155	2.201	0.000	2.201	2.253	2.300	2.383	2.431	Continuing	Continuing

A. Mission Description and Budget Item Justification

Acquisition Decision Memorandum (ADM), April 24th 2009, directed all capabilities identified in the October 4th 2006, Counter Communications System (CCS) Block 20, Joint Requirements Oversight Council (JROC) approved Capability Development Document (CDD) shall be accomplished as Pre-planned Product Improvement Program (P3I) upgrades to the CCS Block 10. On April 11th 2016, Air Force Space Command (AFSPC) updated the ADM adding additional responsibility for CCS Block 10.3 Meadowlands.

CCS provides expeditionary, deployable, reversible offensive space control (OCS) effects applicable across the full spectrum of conflict. It prevents adversary Satellite Communications (SATCOM) in Area of Responsibility (AOR) including Command & Control (C2), Early Warning, and Propaganda; and hosts Rapid Reaction Capabilities in response to Urgent Needs. This program effort includes architecture engineering and studies, system hardware design and development, software design and integration, and testing and demonstration of capabilities to provide disruption of satellite communications signals.

As previously reported, in FY 2024, Counter Communications System (CCS) Emerging Threat Integration Program (CETIP) is a new start. This project defines, tests, and integrates new software capabilities and minor hardware solutions to ensure the Counter Communications System is able to maintain effectiveness against emerging threats and adversary capabilities.

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

Bounty Hunter (BH) is a ground-based, deployable, tactical space Electronic Warfare Support system (ES) that provides SATCOM geolocation and interference detection capabilities to support the Defensive Space Control of US systems in a specific AOR. BH provides the capability to monitor, detect, characterize and geolocate friendly and unfriendly electro-magnetic interference (EMI) across multiple radio frequency bands in support of Command, Control, Communications, Computers, and Intelligence (C4I) systems by US Joint Forces. Continuing annual agile development is needed to meet new user needs in an ever-changing threat environment.

This program element may include civilian pay expenses required to manage, execute, and deliver Bounty Hunter capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605829S.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206421SF / <i>Counterspace Systems</i>
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This program is in Budget Activity 5, System Development and Demonstration (SDD) because it has passed Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full rate production.

B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	31.544	36.537	37.014	0.000	37.014
Current President's Budget	32.683	36.537	37.078	0.000	37.078
Total Adjustments	1.139	0.000	0.064	0.000	0.064
• 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	1.840	0.000			
• SBIR/STTR Transfer	-0.701	0.000			
• Other Adjustments	0.000	0.000	0.064	0.000	0.064

Change Summary Explanation

FY 2023: +\$1.840 million increase for CCS Meadowlands integration and test.

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 5					R-1 Program Element (Number/Name) PE 1206421SF / <i>Counterspace Systems</i>				Project (Number/Name) 65A001 / <i>Counter Satellite Communications System</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
65A001: <i>Counter Satellite Communications System</i>	-	20.666	34.382	34.877	0.000	34.877	35.132	35.855	37.149	37.882	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Acquisition Decision Memorandum (ADM), April 24th 2009, directed all capabilities identified in the Oct 4th 2006 CCS Block 20, Joint Requirements Oversight Council (JROC) approved Capability Development Document (CDD) shall be accomplished as Pre-planned Product Improvement Program (P3I) upgrades to the Counter Communications System (CCS) Block 10. On April 11th 2016, Air Force Space Command (AFSPC) signed and updated the ADM adding additional responsibility for CCS Block 10.3 Meadowlands.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Counter Communications System (CCS) Pre-planned Product Improvement (P3I) Program	20.666	33.605	7.000
Description: Develop, integrate, test and field the CCS P3I program. This is an incremental approach to deliver Block 20 CCS capabilities.			
FY 2024 Plans: Complete P3I testing and system delivery of the Block 10 P3I Meadowlands program. Integrate CCS Block 10.3 Meadowlands into architecture, including forward garrison systems, mission-specific emulators, training environment and multi-range integration. Funding will allow the program to rapidly respond and implement system resiliency and situational awareness necessary to operate in the contested space domain. RDT&E funding is required to support this transformation and enable Space Superiority end-to-end integration activities such as, but not limited to, program office support, studies, technical analysis, experimentation, prototyping, architectural development, systems engineering demonstrations, testing, command and control integration, and mission partner integration.			
FY 2025 Plans: Complete P3I testing and system delivery of the Block 10 P3I Meadowlands program. Prepare to integrate CCS Block 10.3 Meadowlands into architecture, including forward garrison systems, mission specific emulators, training environment and multi-range integration. Prepare to support integrated testing and transition to operations. Funding will allow the program to rapidly respond and implement system resiliency and situational awareness necessary to operate in the contested space domain. RDT&E funding is required to support this transformation and enable Space Superiority end-to-end integration activities such as, but not limited to, program office support, studies, technical analysis, experimentation, prototyping, architectural development, systems engineering demonstrations, testing, command and control integration and mission partner integration.			
FY 2024 to FY 2025 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206421SF / <i>Counterspace Systems</i>	Project (Number/Name) 65A001 / <i>Counter Satellite Communications System</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
FY 2025 decreased due to FY 2024 increase in deferred mandatory testing and integration efforts to sell off system level performance requirements.			
<p>Title: Counter Communications System (CCS) Emerging Threat Integration Program (CETIP)</p> <p>Description: Provides time relevant and intelligence informed software capabilities and minor hardware solutions against new and emerging threats. Updates and transitions existing mission techniques and establishes new mission techniques to ensure CCS maintains effectiveness against evolving adversary capabilities.</p> <p>FY 2024 Plans: FY 2024 reduced by -28.382M in order to complete deferred mandatory testing and integration efforts for CCS P3I program. Award risk reduction study for future mission techniques entailing modern iterative development of new software applications and algorithms to meet emergent threats. Activities may include, but are not limited to, risk reduction, studies, technical analysis, etc.</p> <p>FY 2025 Plans: Begin studies for up to three mission techniques with options for development. Start concentrated stand-alone testing of CCS capabilities to refine space warfighting techniques and prepare for transition into EW architecture. Begin new antenna band development. Activities may include, but are not limited to, risk reduction studies, technical analysis, experimentation, prototyping, etc.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased due to start of CETIP development, test, and transition activities.</p>	0.000	0.777	27.877
Accomplishments/Planned Programs Subtotals	20.666	34.382	34.877

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u> <u>Base</u>	<u>FY 2025</u> <u>OCO</u>	<u>FY 2025</u> <u>Total</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>FY 2029</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• SPAF 01 CTRSPC: <i>Counterspace Systems</i>	51.352	50.565	4.277	-	4.277	2.059	2.111	2.156	2.199	0.000	114.719

Remarks

D. Acquisition Strategy

The CETIP acquisition will be awarded using competitive procedures and existing contracts when applicable to upgrade existing capabilities, as well as, to acquire next-generation capabilities through incremental acquisitions.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force												Date: March 2024			
Appropriation/Budget Activity 3620F / 5				R-1 Program Element (Number/Name) PE 1206421SF / Counterspace Systems				Project (Number/Name) 65A001 / Counter Satellite Communications System							
Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Block 10 P3I Development	Various	Various : El Segundo, CA	-	15.192	Feb 2023	22.819	Feb 2024	7.000	Feb 2025	-		7.000	Continuing	Continuing	-
CETIP Development	Various	TBD : TBD	-	-		0.777	Sep 2024	16.162	Oct 2024	-		16.162	Continuing	Continuing	-
Technical Mission Analysis	RO	Aerospace Corp : El Segundo, CA	-	0.200	Oct 2022	1.227	Oct 2023	1.296	Oct 2024	-		1.296	Continuing	Continuing	-
Enterprise Systems Engineering and Integration	C/FFP	Various : Various, CA	-	0.000	May 2023	1.022	May 2024	1.042	May 2025	-		1.042	Continuing	Continuing	-
Counterspace Architecture Development	C/CPFF	NGMS : Redondo Beach, CA	-	0.427	Jan 2023	0.937	Jan 2024	0.954	Jan 2025	-		0.954	Continuing	Continuing	-
SBIR/STTR	Allot	Not specified. : TBD	-	-		1.238	Oct 2023	1.253	Oct 2024	-		1.253	Continuing	Continuing	-
Subtotal			-	15.819		28.020		27.707		-		27.707	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Security	C/CPAF	Mantech : El Segundo, CA	-	2.292	Nov 2022	2.349	Nov 2023	2.391	Nov 2024	-		2.391	Continuing	Continuing	-
Subtotal			-	2.292		2.349		2.391		-		2.391	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
FFRDC	RO	Aerospace Corp : El Segundo, CA	-	0.068	Oct 2022	0.558	Oct 2023	1.271	Oct 2024	-		1.271	Continuing	Continuing	-
A&AS	Various	Various : El Segundo, CA	-	2.351	May 2023	3.354	May 2024	3.405	May 2025	-		3.405	Continuing	Continuing	-
Other Support	Various	Various : El Segundo, CA	-	0.136	Oct 2022	0.101	Oct 2023	0.103	Oct 2024	-		0.103	Continuing	Continuing	-

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force			Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206421SF / Counterspace Systems	Project (Number/Name) 65A001 / Counter Satellite Communications System	

	FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
CCS B10.3																												
10.3 Development	[Redacted]																											
Technique Development (2x per year)	[Redacted]																											
10.3 Development Test/Operational Test													[Redacted]															
10.3 System Deliveries #1-4													[Redacted]															
CETIP																												
Risk Reduction Study									[Redacted]																			
Mission Technique #1									[Redacted]																			
Mission Technique #2									[Redacted]																			
New Antenna Band Development									[Redacted]																			
Mission Technique #3													[Redacted]															
Alternative SATCOM Antenna Development													[Redacted]															
Mission Technique #4													[Redacted]															
Mission Technique #5													[Redacted]															

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206421SF / <i>Counterspace Systems</i>	Project (Number/Name) 65A001 / <i>Counter Satellite Communications System</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
CCS B10.3				
10.3 Development	1	2023	1	2026
Technique Development (2x per year)	1	2023	4	2024
10.3 Development Test/Operational Test	1	2026	2	2026
10.3 System Deliveries #1-4	2	2026	3	2026
CETIP				
Risk Reduction Study	4	2024	1	2025
Mission Technique #1	1	2025	2	2026
Mission Technique #2	1	2025	2	2027
New Antenna Band Development	2	2025	2	2028
Mission Technique #3	3	2025	3	2027
Alternative SATCOM Antenna Development	4	2026	4	2028
Mission Technique #4	1	2026	3	2028
Mission Technique #5	4	2026	2	2029

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 5					R-1 Program Element (Number/Name) PE 1206421SF / <i>Counterspace Systems</i>				Project (Number/Name) 65A013 / <i>BOUNTY HUNTER</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
65A013: <i>BOUNTY HUNTER</i>	-	12.017	2.155	2.201	0.000	2.201	2.253	2.300	2.383	2.431	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Bounty Hunter (BH) is a ground-based, deployable, tactical space Electronic Warfare System (EWS) that provides SATCOM geolocation and interference detection capabilities to support the Defensive Space Control of US systems in a specific AOR. BH provides the capability to monitor, detect, characterize and geolocate friendly and unfriendly electro-magnetic interference (EMI) across multiple radio frequency bands in support of Command, Control, Communications, Computers, and Intelligence (C4I) systems by US Joint Forces. Continuing annual agile development is needed to meet new user needs in an ever-changing threat environment.

This program element may include necessary emergent or unanticipated civilian pay expenses required to manage, execute, and deliver Bounty Hunter for emergent or unanticipated weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605829F. In PY 2023 \$0.144M was expended for civilian pay expenses in this program element, and in CY 2024 \$0.149M forecasted for civilian pay expenses in this program element.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Bounty Hunter (BH)	12.017	2.155	2.201
Description: Develop new capabilities for the BH program to meet and maintain pace with the operational threat environment. Specific accomplishments are classified.			
FY 2024 Plans: Continue with execution of the program RDT&E plan for system upgrades to allow for system component consolidation and refinement of a remote operations capability. Machine learning is being continuously improved to allow faster characterization of signals of interest. Development activities/efforts may include, but are not limited to, program office support, studies, technical analysis, experimentation, and prototyping. FY 2024 development will also focus on further automation of BH capabilities in an effort to reduce the operational manning of the deployed systems as well as exploring an operational concept to expand over the horizon capacities.			
FY 2025 Plans: Continued execution of the program RDT&E plan for system upgrades and smaller form factor systems that can be forward deployed to develop a mesh network by means of remote operations across all BH systems within the fleet. Development activities/efforts may include, but are not limited to, program office support, studies, technical analysis, experimentation, and prototyping. Further, FY 2025 development will focus on automation of BH capabilities through machine learning to reduce the operational manning of the deployed systems as well as exploring an operational concept to expand over the horizon capacities.			
FY 2024 to FY 2025 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206421SF / <i>Counterspace Systems</i>	Project (Number/Name) 65A013 / <i>BOUNTY HUNTER</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
FY 2025 increased due to anticipated inflationary adjustments of costs for developmental efforts.			
Accomplishments/Planned Programs Subtotals	12.017	2.155	2.201

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
• SPAF 01 CTRSPC: <i>Counterspace Systems</i>	5.287	2.100	-	-	-	-	-	-	-	0.000	7.387

Remarks
 BH was established in FY 2016 as a Joint Capability Technology Demonstration (JCTD) project in response to a Joint Urgent Operational Need (JUON) in 2010. BH was established as a Program of Record (PoR) in March 2019.

D. Acquisition Strategy
 Contracts funded for development efforts supporting the BH Program Management Office (PMO) shall be awarded to the COLSA Corporation through FY 2025. The PMO will re-compete the contract every five years to ensure continued alignment with program goals and objectives.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206421SF / <i>Counterspace Systems</i>	Project (Number/Name) 65A013 / <i>BOUNTY HUNTER</i>
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Bounty Hunter Equipment	MIPR	Navy Research Laboratory : TBD	-	0.924	Nov 2022	-		-		-		-	Continuing	Continuing	-
Bounty Hunter Developmental Test Support	PO	AFLCMC/HNCP : TBD	-	0.298		0.416		0.309		-		0.309	Continuing	Continuing	-
Bounty Hunter Development	SS/CPFF	COLSA : Huntsville, AL	-	0.651	Mar 2023	1.590	Mar 2024	1.738	Mar 2025	-		1.738	Continuing	Continuing	-
Bounty Hunter Machine Learning (ML)	C/CPFF	COLSA : Huntsville, AL	-	10.000	Jun 2023	-		-		-		-	Continuing	Continuing	-
Subtotal			-	11.873		2.006		2.047		-		2.047	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Bounty Hunter Civilian Pay DCA	TBD	USAF : Hanscom AFB, MA	-	0.144	Oct 2022	0.149	Oct 2023	0.154	Oct 2024	-		0.154	Continuing	Continuing	-
Subtotal			-	0.144		0.149		0.154		-		0.154	Continuing	Continuing	N/A

	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals		-	12.017	2.155	2.201	-		2.201	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206421SF / <i>Counterspace Systems</i>	Project (Number/Name) 65A013 / <i>BOUNTY HUNTER</i>
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FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Bounty Hunter	
Bounty Hunter Incremental Development	
Bounty Hunter Ops System #1 Operations	
Bounty Hunter Ops System #2 Operations	
Bounty Hunter Ops System #3 Operations	
Bounty Hunter Ops System #4 Operations	
Bounty Hunter Ops System #5 Production	
Bounty Hunter Ops System #5 Operations	
Bounty Hunter Trainer #1 Operations	
Bounty Hunter Trainer #2 Operations	
Bounty Hunter Trainer #3 Production	
Bounty Hunter Trainer #3 Operations	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206421SF / <i>Counterspace Systems</i>	Project (Number/Name) 65A013 / <i>BOUNTY HUNTER</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Bounty Hunter</i>				
Bounty Hunter Incremental Development	1	2023	4	2029
Bounty Hunter Ops System #1 Operations	1	2023	4	2029
Bounty Hunter Ops System #2 Operations	1	2023	4	2029
Bounty Hunter Ops System #3 Operations	4	2023	4	2029
Bounty Hunter Ops System #4 Operations	4	2023	4	2029
Bounty Hunter Ops System #5 Production	1	2023	3	2023
Bounty Hunter Ops System #5 Operations	4	2023	4	2029
Bounty Hunter Trainer #1 Operations	1	2023	4	2029
Bounty Hunter Trainer #2 Operations	1	2023	4	2029
Bounty Hunter Trainer #3 Production	1	2023	3	2024
Bounty Hunter Trainer #3 Operations	4	2024	4	2029

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206422SF / <i>Weather System Follow-on</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	135.374	47.110	79.727	49.207	0.000	49.207	39.901	35.753	25.828	9.367	0.000	422.267
65A038: <i>SSA Environmental Monitoring</i>	4.574	1.438	0.000	2.042	0.000	2.042	2.088	2.136	2.184	0.000	0.000	14.462
65A039: <i>WSF-M</i>	130.800	45.672	79.727	47.165	0.000	47.165	37.813	33.617	23.644	9.367	0.000	407.805

A. Mission Description and Budget Item Justification

In FY 2023, PE 1206422SF, Weather System Follow-On, Project 644289, Weather Satellite Follow-On, R-1 Line #8 efforts were transferred to PE 1206422SF, Weather System Follow-On, Project 65A039, Weather System Follow-on - Microwave (WSF-M), R-1 Line #20 reflecting the successful completion of Milestone B on 15 May 2020.

Weather System Follow-on program 1206422SF consists of Space Situational Awareness Environmental Monitoring (SSAEM) Project 65A038 and WSF-M Project 65A039.

SSAEM Project 65A038 is a non-ACAT, Class D technology demonstration project to support the international Constellation Observing System for Meteorology, Ionosphere and Climate 2 (COSMIC-2) mission. The SSAEM program provides the acquisition, development and launch/on-orbit support of 18 space/terrestrial weather sensors to COSMIC-2 partnership in coordination with National Oceanic and Atmospheric Administration (NOAA) and Taiwan Space Agency (TASA). COSMIC-2 launched six satellites in an equatorial, Low Earth Orbit (LEO) with 3 SSAEM sensors in each spacecraft in FY 2019. The sensor types are Tri-Global Navigation Satellite System (Tri-GNSS) Radio occultation System (TGRS), Ion Velocity Meter (IVM) and Radio Frequency Beacon (RFB). The SSAEM sensors will address three distinct Joint Requirement Oversight Committee (JROC)-approved Category A weather capability gaps, specifically Gap #4 (Ionospheric Density), Gap #7 (Equatorial Ionospheric Scintillation) and Gap #12 (Electric Field), to provide additional space meteorological data to improve forecast capabilities and improve warfighter navigation/communication capabilities.

The Weather Satellite Follow-on - Microwave (WSF-M) Project 65A039 includes funds for the WSF-M system, the Compact Ocean Wind Vector Radiometer (COWVR) technology demonstration, and the Energetic Charged Particle (ECP) sensor development.

Weather System Follow-on (WSF) is a Low-Earth Orbit (LEO) microwave imaging system developed and delivered by the United States Space Force's Space Systems Command (SSC). WSF is the next generation of space-based passive microwave sensing technology. It will provide U.S. and Allied warfighters with essential weather data, including the measurement of ocean surface wind speed and direction, ice thickness, snow depth, soil moisture, and local spacecraft energetic charged particle environment. The ocean surface wind speed measurement enables tropical cyclone intensity determination by the Joint Typhoon Warning Center. The data gathered by WSF will be provided to meteorologists in support of the generation of a wide variety of weather products necessary to conduct mission planning and operations globally.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206422SF / <i>Weather System Follow-on</i>
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WSF is an Acquisition Category IB program comprised of two Space Vehicles (SV) and their associated command, control, and data dissemination network. Global environmental monitoring data is gathered, stored, and down-linked through the Satellite Control Network (SCN) and disseminated to Air Force and Navy weather centers. Additionally, data is broadcast real time by the satellite for utilization by heritage Direct Readout Terminals that use the data for local weather forecasting.

WSF is a Major Defense Acquisition Program (MDAP) with the Space Force as the lead component. Founded on the Space-Based Environmental Monitoring (SBEM) Analysis of Alternatives (AoA) results, the WSF will be to enable:

- 1) Timely weather collection over broad oceans in support of maneuvering forces;
- 2) Space weather capabilities to characterize operational orbits, space situational awareness, and the ionosphere.

Secondary investments may be supported to address weather gaps identified in the SBEM AoA and validated by the JROC.

COWVR is an on-orbit demonstration project of the new COWVR technology to deliver Weather Gap #3, Ocean Surface Vector Winds (OSVW) and Gap #8, Tropical Cyclone Intensity (TCI).

ECP supports the SBEM Weather Gap #11, Low Earth Orbit Energetic Charged Particle Characterization. To support this requirement, the ECP sensor will be integrated on the WSF-M satellites.

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

This program is in Budget Activity 5, System Development and Demonstration (SDD) because it has passed Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full rate production.

B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	48.720	79.727	50.884	0.000	50.884
Current President's Budget	47.110	79.727	49.207	0.000	49.207
Total Adjustments	-1.610	0.000	-1.677	0.000	-1.677
• 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	-1.610	0.000			
• Other Adjustments	0.000	0.000	-1.677	0.000	-1.677

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force Date: March 2024

Appropriation/Budget Activity
3620F: *Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)*

R-1 Program Element (Number/Name)
PE 1206422SF / *Weather System Follow-on*

Change Summary Explanation

FY 2023: -1.610M for SBIR/STTR transfer
FY 2025: +\$2.025M FY25 POM Adjustment (+\$2.038M BPAC 65A038 and -\$0.013M BPAC 65A039)
FY 2025: The FY 2025 funding request was reduced by \$3.8 million to account for the availability of prior year execution balances.

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206422SF / <i>Weather System Follow-on</i>	Project (Number/Name) 65A038 / <i>SSA Environmental Monitoring</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
65A038: <i>SSA Environmental Monitoring</i>	4.574	1.438	0.000	2.042	0.000	2.042	2.088	2.136	2.184	0.000	0.000	14.462
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Space Situational Awareness Environmental Monitoring (SSAEM) program is a non-ACAT, Class D technology demonstration project to support the international Constellation Observing System for Meteorology, Ionosphere and Climate 2 (COSMIC-2) mission. The SSAEM program provides the acquisition, development and launch/on-orbit support of 18 space/terrestrial weather sensors to COSMIC-2 partnership in coordination with National Oceanic and Atmospheric Administration (NOAA) and Taiwan Space Agency (TASA). COSMIC-2 launched six satellites in an equatorial, Low Earth Orbit (LEO) with 3 SSAEM sensors in each spacecraft in FY 2019. The sensor types are Tri-Global Navigation Satellite System (Tri-GNSS) Radio occultation System (TGRS), Ion Velocity Meter (IVM) and Radio Frequency Beacon (RFB). The SSAEM sensors will address three distinct Joint Requirement Oversight Committee (JROC)-approved Category A weather gaps, specifically Gap #4 (Ionospheric Density), Gap #7 (Equatorial Ionospheric Scintillation) and Gap #12 (Electric Field), to provide additional space meteorological data to improve forecast capabilities and improve warfighter navigation/communication capabilities.

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

The RFB ground station equipment will be transferred to AFRL to continue development and potential fielding options for future ops capability. Operational fixes for TGRS began 2QFY23 and IVM validation finalizes later in FY 2023. Design life has extended through FY 2033 due to system performance exceeding expectations.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Space Situational Awareness Environment Monitoring (SSAEM)	1.438	0.000	2.042	0.000	2.042
Description: The SSAEM program provides the acquisition, development and launch/on-orbit support of 18 space/terrestrial weather sensors to COSMIC-2 partnership in coordination with National Oceanic and Atmospheric Administration (NOAA) and Taiwan's National Space Organization (NSPO).					
FY 2024 Plans: N/A.					
FY 2025 Base Plans: Implement operational improvements, deliver new upgrades to data products, continue improvements through Solar Maximum period. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support,					

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206422SF / <i>Weather System Follow-on</i>	Project (Number/Name) 65A038 / <i>SSA Environmental Monitoring</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities. FY 2025 OCO Plans: N/A FY 2024 to FY 2025 Increase/Decrease Statement: Funding increase is due to system updates and improvements, adding capability, other sustainment actions.					
Accomplishments/Planned Programs Subtotals	1.438	0.000	2.042	0.000	2.042

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

SSAEM post-launch and cal/val support contract is the sole-source contract to University Corporation Atmospheric Research due to their expertise in radio occultation and space weather monitoring for SSAEM sensors. The Justification & Approval (J&A) was approved in June 2018 and the Request for Proposal was released on August 1st, 2018. The contract was awarded in July 2019 for 5-years of post-launch cal/val and on-orbit support. Spacecraft mission life was extended in coordination with NOAA and TASA through FY 2033.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206422SF / <i>Weather System Follow-on</i>	Project (Number/Name) 65A038 / <i>SSA Environmental Monitoring</i>
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
UCAR Sensor R&D	SS/CPFF	UCAR : TBD	1.846	0.594	Nov 2022	-		0.993	Nov 2024	-		0.993	2.917	6.350	-
On-Orbit Support (UCAR/JPL)	MIPR	UCAR/JPL : Boulder, CO	1.023	0.395	Nov 2022	-		0.576	Nov 2024	-		0.576	1.873	3.867	-
Ground Support	Various	Various : TBD	1.341	0.072	Nov 2022	-		0.056	Nov 2024	-		0.056	0.000	1.469	-
Technical Mission Analysis	RO	Aerospace Corp : El Segundo, CA	0.150	0.104	Nov 2022	-		0.104	Nov 2024	-		0.104	0.307	0.665	-
SBIR/STTR	Various	TBD : TBD	0.000	0.047		-		0.061	Mar 2025	-		0.061	0.224	0.332	-
Subtotal			4.360	1.212		-		1.790		-		1.790	5.321	12.683	N/A

Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
FFRDC	RO	Aerospace Corp : El Segundo, CA	0.212	0.226	Nov 2022	-		0.226	Nov 2024	-		0.226	0.715	1.379	-
A&AS	Various	Various : Various	0.000	0.000	May 2023	-		0.000	May 2025	-		0.000	0.358	0.358	-
Other Support	Various	Various : Various	0.002	0.000	Nov 2022	-		0.026	Nov 2024	-		0.026	0.000	0.028	-
Subtotal			0.214	0.226		-		0.252		-		0.252	1.073	1.765	N/A

Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract			
Project Cost Totals			4.574	1.438	-	2.042	-	2.042	6.394	14.448	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force			Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206422SF / <i>Weather System Follow-on</i>	Project (Number/Name) 65A038 / <i>SSA Environmental Monitoring</i>	

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Space Situational Awareness	
Environmental Monitoring	
SSAEM Sensor Cal/Val	
On Orbit Activities	
RFBrcyberhardening & Fielding Activities	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206422SF / <i>Weather System Follow-on</i>	Project (Number/Name) 65A038 / <i>SSA Environmental Monitoring</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Space Situational Awareness Environmental Monitoring</i>				
SSAEM Sensor Cal/Val	1	2023	3	2023
On Orbit Activities	1	2023	4	2028
RFBBr Cyberhardening & Fielding Activities	1	2023	2	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5					R-1 Program Element (Number/Name) PE 1206422SF / <i>Weather System Follow-on</i>				Project (Number/Name) 65A039 / <i>WSF-M</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
65A039: <i>WSF-M</i>	130.800	45.672	79.727	47.165	0.000	47.165	37.813	33.617	23.644	9.367	0.000	407.805
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In FY 2023, PE 1206422SF, Weather System Follow-On, Project 644289, Weather Satellite Follow-On, R-1 Line #8 efforts were transferred to PE 1206422SF, Weather System Follow-On, Project 65A039, Weather System Follow-on - Microwave (WSF-M), R-1 Line #20 reflecting the successful completion of Milestone B on 15 May 2020.

The Weather Satellite Follow-on - Microwave (WSF-M) Project 65A039 includes funds for the WSF-M system, the Compact Ocean Wind Vector Radiometer (COWVR) technology demonstration, and the Energetic Charged Particle (ECP) sensor development.

Weather System Follow-on (WSF) is a Low-Earth Orbit (LEO) microwave imaging system developed and delivered by the United States Space Force's Space Systems Command (SSC). WSF is the next generation of space-based passive microwave sensing technology. It will provide U.S. and Allied warfighters with essential weather data, including the measurement of ocean surface wind speed and direction, ice thickness, snow depth, soil moisture, and local spacecraft energetic charged particle environment. The ocean surface wind speed measurement enables tropical cyclone intensity determination by the Joint Typhoon Warning Center. The data gathered by WSF will be provided to meteorologists in support of the generation of a wide variety of weather products necessary to conduct mission planning and operations globally.

WSF is an Acquisition Category IB program comprised of two Space Vehicles (SV) and their associated command, control, and data dissemination network. Global environmental monitoring data is gathered, stored, and down-linked through the Satellite Control Network (SCN) and disseminated to Air Force and Navy weather centers. Additionally, data is broadcast real time by the satellite for utilization by heritage Direct Readout Terminals that use the data for local weather forecasting.

WSF is a Major Defense Acquisition Program (MDAP) with the Space Force as the lead component. Founded on the Space-Based Environmental Monitoring (SBEM) Analysis of Alternatives (AoA) results, the WSF will be to enable:

- 1) Timely weather collection over broad oceans in support of maneuvering forces;
- 2) Space weather capabilities to characterize operational orbits, space situational awareness, and the ionosphere.

Secondary investments may be supported to address weather gaps identified in the SBEM AoA and validated by the JROC.

COWVR is an on-orbit demonstration project of the new COWVR technology to deliver Weather Gap #3, Ocean Surface Vector Winds (OSVW) and Gap #8, Tropical Cyclone Intensity (TCI).

ECP supports the SBEM Weather Gap #11, Low Earth Orbit Energetic Charged Particle Characterization. To support this requirement, the ECP sensor will be integrated on the WSF-M satellites.

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206422SF / <i>Weather System Follow-on</i>	Project (Number/Name) 65A039 / <i>WSF-M</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
<p>Title: WSF Microwave Satellite (SV1-2)</p> <p>Description: Develop, build, integrate, and test the WSF Microwave (WSF-M) satellites, including bus, payloads, and ground upgrades to satisfy JROC-directed SBEM Capability gaps.</p> <p>FY 2024 Plans: Launch, early orbit, checkout, calibration and validation and Initial Operational Capability of WSF-M SV-1. Continue manufacturing and build of SV-2 to include payload and spacecraft unit and subsystems production. Begin SV-2 spacecraft and payload I&T. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p>FY 2025 Base Plans: Complete calibration and validation, and Full Operational Capability of WSF-M SV-1. Conduct integration and test of WSF-M SV-2 to prepare for planned storage. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY25 decrease due to completion of WSF-M SV-1 launch, calibration and operational acceptance in FY24. Additionally, WSF-M SV-2 long lead purchases completed in FY24.</p>	43.271	76.981	44.734	-	44.734
<p>Title: COWVR Tech Demo</p> <p>Description: The Compact Ocean Wind Vector Radiometer (COWVR) launch objective supports Category A Weather Requirements, as codified in JROC Memo 092-014, providing on-orbit technology demonstration of the new COWVR technology to deliver Weather Gap #3, Ocean Surface Vector Winds (OSVW) and Gap #8, Tropical Cyclone Intensity (TCI). This is a cooperative mission with NASA for integrating the sensor onto the International Space Station (ISS) as a weather technology demonstration project. The mission designation for the COWVR is Space Test Program Houston Mission #8 (STP-H8). Demonstrating COWVR technology in the space environment remains an important milestone for the microwave data weather mission.</p> <p>FY 2024 Plans:</p>	2.096	1.640	1.640	-	1.640

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206422SF / <i>Weather System Follow-on</i>	Project (Number/Name) 65A039 / <i>WSF-M</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
<p>Continue operating the sensor and gathering data for potential inclusion into current weather models. This funding includes but is not limited to payload commanding, data interpretation and dissemination, and other ground operational support.</p> <p>FY 2025 Base Plans: Continue operating the sensor and gathering data for inclusion into current weather models. This funding includes but is not limited to payload commanding, data interpretation and dissemination, and other ground operational support.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: N/A.</p>					
<p>Title: ECP</p> <p>Description: Energetic Charged Particles (ECP) will support the SBEM Weather Gap 11 and address the Secretary of the Air Force (SECAF) policy which directed each Space Force Satellite Office to plan for ECP sensors on all pre-Milestone B satellite acquisitions. To support this requirement, the ECP sensor will be integrated on the WSF-M satellites.</p> <p>FY 2024 Plans: Begin integration and test of ECP payload for SV-2.</p> <p>FY 2025 Base Plans: Integrate ECP payload on WSF-M SV-2.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY25 decrease due to ECP for WSF-M SV-2 completing payload integration in FY24.</p>	0.305	1.106	0.791	-	0.791
Accomplishments/Planned Programs Subtotals	45.672	79.727	47.165	-	47.165

C. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

D. Acquisition Strategy
The acquisition strategy for WSF is based on validated SBEM AoA results from FY 2014 and subsequent acquisition strategy development activities that were conducted in FY 2015. The WSF acquisition strategy focuses on streamlined acquisition processes for providing materiel solutions to OSVW, TCI & LEO ECP, as validated by the

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force Date: March 2024

Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)
3620F / 5	PE 1206422SF / <i>Weather System Follow-on</i>	65A039 / <i>WSF-M</i>

JROC; deliver microwave sensing solution to address DoD needs for OSVW and TCI capabilities and deliver space environment sensing solution to address LEO ECP capabilities for on-orbit attributions and support of anomaly resolutions.

The Space Force is conducting a technology demonstration of the Compact Ocean Wind Vector Radiometer (COWVR) sensor on the International Space Station (ISS), utilizing its unique technology demonstration capabilities for on-orbit demonstration of COWVR technology. The Space Systems Command (SSC) Space Test Program Office is the lead Space Force organization spearheading the NASA partnership, with the SSC Space Sensing (SN) Directorate responsible for the COWVR sensor and providing programmatic support to enable COWVR sensor to ISS integration/technology demonstration.

The program awarded a contract for WSF-M with up to two satellites through a full and open competition. The WSF-M first satellite (SV-1) base contract awarded Nov 2017. The pre-priced WSF-M SV-2 option was exercised in Nov 2022. WSF-M SV-2 ILC is 3rd quarter FY 2027. The WSF SV-2 will be functionally equivalent to SV-1. The Naval Research Lab Blossom Point Tracking Facility (BPTF) will be the Satellite Operations Center (SOC) for WSF-M.

The WSF ECP sensor is developed by AFRL and will be integrated onto the WSF-M satellites.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206422SF / <i>Weather System Follow-on</i>	Project (Number/Name) 65A039 / <i>WSF-M</i>
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
WSF COWVR Technology Demonstration	Various	Various : TBD	1.455	2.096	Apr 2023	1.640	Apr 2024	1.640	Apr 2025	-		1.640	0.000	6.831	-
WSF Microwave System (SV1-2)	C/CPFF	Ball Aerospace, : Boulder, CO	92.963	24.480	Nov 2022	53.625	Nov 2023	21.360	Nov 2024	-		21.360	47.496	239.924	506.890
WSF ECP	C/Various	Various : Various	2.780	0.305	Jan 2023	1.106	Jan 2024	0.791	Jan 2025	-		0.791	0.000	4.982	-
WSF Enterprise Systems Engineering & Integration	C/CPAF	Engility Corp : Andover, MA	3.230	0.791	Nov 2022	2.325	Nov 2023	3.125	Nov 2024	-		3.125	8.224	17.695	-
WSF Technical Mission Analysis	RO	Aerospace Corp. : El Segundo, CA	11.220	6.424	Nov 2022	7.102	Nov 2023	6.975	Nov 2024	-		6.975	11.930	43.651	-
WSF Blossom Point Naval Research Laboratory	MIPR	NRL : Welcome, MD	6.429	6.699	Dec 2022	4.017	Dec 2023	3.986	Dec 2024	-		3.986	14.124	35.255	-
SBIR/STTR	Various	Not specified. : TBD	0.000	1.563		2.790		1.781		-		1.781	3.773	9.907	-
Subtotal			118.077	42.358		72.605		39.658		-		39.658	85.547	358.245	N/A

Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
WSF FFRDC	RO	Aerospace Corp : El Segundo, CA	4.752	2.753	Nov 2022	3.342	Nov 2023	3.282	Nov 2024	-		3.282	13.559	27.688	-
WSF A&AS	Various	Various : El Segundo, CA	7.394	0.380	Feb 2023	3.572	Feb 2024	3.965	Feb 2025	-		3.965	4.467	19.778	-
WSF Other Support	Various	Various : El Segundo, CA	0.577	0.181	Nov 2022	0.208	Nov 2023	0.260	Nov 2024	-		0.260	0.654	1.880	-
Subtotal			12.723	3.314		7.122		7.507		-		7.507	18.680	49.346	N/A

	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals		130.800	45.672	79.727	47.165	-	47.165	104.227	407.591	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206422SF / <i>Weather System Follow-on</i>	Project (Number/Name) 65A039 / <i>WSF-M</i>
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	FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

	FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
<i>Weather System Follow-On</i>																												
WSF SV-1 Production/Integration and Test																												
WSF SV-1 Initial Launch Capability																												
WSF SV-1 Initial Operational Capability																												
WSF SV-1 Full Operational Capability																												
WSF ECP Development & Delivery to Prime Contractor for SV-2																												
WSF SV-2 Production/Integration and Test																												
WSF SV-2 Initial Launch Capability																												
WSF SV-2 Initial Operation Capability																												
WSF SV-2 Full Operational Capability																												
COWVR Technology Demonstration On-Orbit Operations																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206422SF / <i>Weather System Follow-on</i>	Project (Number/Name) 65A039 / <i>WSF-M</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Weather System Follow-On</i>				
WSF SV-1 Production/Integration and Test	1	2023	4	2023
WSF SV-1 Initial Launch Capability	2	2024	2	2024
WSF SV-1 Initial Operational Capability	3	2024	4	2024
WSF SV-1 Full Operational Capability	2	2025	2	2025
WSF ECP Development & Delivery to Prime Contractor for SV-2	4	2024	4	2024
WSF SV-2 Production/Integration and Test	1	2023	2	2027
WSF SV-2 Initial Launch Capability	3	2027	3	2027
WSF SV-2 Initial Operation Capability	2	2028	2	2028
WSF SV-2 Full Operational Capability	2	2029	2	2029
COWVR Technology Demonstration On-Orbit Operations	1	2023	4	2025

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206425SF / <i>Space Situation Awareness Systems</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	93.914	372.827	483.605	0.000	483.605	468.666	447.323	349.612	342.017	0.000	2,557.964
656565: <i>Ground Based SDA</i>	-	0.000	214.739	254.562	0.000	254.562	288.296	294.242	304.856	310.869	0.000	1,667.564
65A006: <i>Space Based SDA</i>	-	93.914	115.636	178.100	0.000	178.100	167.595	153.081	44.756	31.148	0.000	784.230
65A037: <i>Ground Based Optical Sensor</i>	-	0.000	42.452	50.943	0.000	50.943	12.775	0.000	0.000	0.000	0.000	106.170

A. Mission Description and Budget Item Justification

Space Domain Awareness (SDA) is one of five core competencies of the Space Force and is the effective identification, characterization, and understanding of any factor, passive or active, associated with the space domain that could affect space operations and thereby impact the security, safety, economy, or environment of our nation. As the foundation for space control, SDA encompasses surveillance of all space objects and activities; detailed surveillance of specific space assets; monitoring space environmental conditions; monitoring cooperative space assets; gathering indications and warning on adversary space operations; and conducting integrated command, control, communications, processing, analysis, dissemination, and archiving activities.

This program element develops new network sensors and improved information integration capabilities across the space surveillance network (SSN) while companion program element 1203940SF fields, upgrades, operationalizes, operates, and maintains Space Force sensors and information integration capabilities within the SSN. Activities funded in this program element (1206425SF) also support efforts such as engineering studies and analyses, architectural engineering studies, trade studies, technology needs forecasting, modernization initiatives, systems engineering, system development, and test & evaluation, and may include prototyping and technology demonstration.

Deep Space Advanced Radar Capability (DARC) is a ground-based, SDA radar system to detect, track, and maintain custody of deep space objects 24/7, through the solar exclusion gap. DARC will augment the SSN as an additional sensor with increased capacity and capability for deep space object custody, providing full global coverage.

The SBSS Follow-On (SBSS FO/SILENTBARKER) program will develop and deliver a system to continue providing space object surveillance from space beyond SBSS Block 10 End-of-Life. The United States Space Force (USSF) and National Reconnaissance Office (NRO) have signed a Memorandum of Agreement partnering SBSS FO with an NRO program based on overlapping requirements. The critical space-based SDA program activity will develop and deliver a system to continue providing space object surveillance. Space Based SDA enables timely detection and custody of on orbit threats in order to protect US High Value Assets in space in support of the National Defense Strategy.

Space Based SDA requirements are based on a Statement of Capabilities and upon the current Space Domain Awareness (SDA) Initial Capabilities Document architectural requirements focused on protecting High Value Assets. Space Based SDA will provide the capability to search, detect, and track objects from a space-based sensor for timely custody and event detection. Surveillance from space augments and overcomes existing ground sensor limitations with timely 24-hour above-

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206425SF / <i>Space Situation Awareness Systems</i>
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the-weather collection of satellite metric data only possible with a space-based sensor. This data is communicated to operators at the Combined Space Operations Center (CSpOC), National Space Defense Center (NSDC), and other classified users. This program element includes efforts related to Space Based SDA, its integration into the broader space superiority architecture, and analysis and experimentation to ensure space-based space surveillance capabilities against the evolving threat.

Ground Based Optical Sensor System (GBOSS) includes an upgrade to the Ground-based Electro-Optical Deep Space Surveillance (GEODSS) system that enables GEODSS to monitor small, closely-spaced, and advanced threats in low, mid, high, and geostationary orbits. The upgraded system will discover currently undetectable space threats, reduce an adversary's tactical surprise and deliver the data required to support accurate, timely, actionable SDA. This facilitates decision-making within the compressed timelines dictated by the realities of the congested, contested, competitive space domain. The program delivers a combination of performance upgrades to existing GEODSS sites, including advanced data exploitation and rapid data dissemination, and will incorporate coalition data, commercial data and/or new GEODSS sites to provide a global capability to positively ID an adversary committing an orbital attack. The program includes updates to the GEODSS image processing and optical subsystems that will enhance the sensitivity and search rate, and fields new multi-spectral advanced technology sensors supporting extended operations, high-fidelity characterization, enhanced indications and warnings (I&W), and attribution.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Space and Ground Based SDA and Ground Based Optical system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 1206392SF and 1206398SF. For Space Based SDA in PY 0.225M was expended for civilian pay expenses in this program element, and in CY 0.225M is forecasted for civilian pay expenses in this program element.

This program is in Budget Activity 5, System Development and Demonstration (SDD) because it has passed Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full rate production.

B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	96.940	372.827	470.054	0.000	470.054
Current President's Budget	93.914	372.827	483.605	0.000	483.605
Total Adjustments	-3.026	0.000	13.551	0.000	13.551
• 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	-3.026	0.000			
• Other Adjustments	0.000	0.000	13.551	0.000	13.551

Change Summary Explanation

FY 2025: -40.118M decrease to Project 65A006, Space Based SDA for higher Space Force priorities.

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206425SF / <i>Space Situation Awareness Systems</i>	Project (Number/Name) 656565 / <i>Ground Based SDA</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
656565: <i>Ground Based SDA</i>	-	0.000	214.739	254.562	0.000	254.562	288.296	294.242	304.856	310.869	0.000	1,667.564
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Space Domain Awareness (SDA) is one of five core competencies of the Space Force and is the effective identification, characterization, and understanding of any factor, passive or active, associated with the space domain that could affect space operations and thereby impact the security, safety, economy, or environment of our nation. As the foundation for space control, SDA encompasses surveillance of all space objects and activities; detailed surveillance of specific space assets; monitoring space environmental conditions; monitoring cooperative space assets; gathering indications and warning on adversary space operations; and conducting integrated command, control, communications, processing, analysis, dissemination, and archiving activities.

This program element develops new network sensors and improved information integration capabilities across the space surveillance network (SSN) while companion program element 1203940SF fields, upgrades, operationalizes, operates, and maintains Space Force sensors and information integration capabilities within the SSN. Activities funded in this program element (1206425SF) also support efforts such as engineering studies and analyses, architectural engineering studies, trade studies, technology needs forecasting, modernization initiatives, systems engineering, system development, and test & evaluation, and may include prototyping and technology demonstration.

Deep Space Advanced Radar Capability (DARC) is a ground-based, SDA radar system to detect, track, and maintain custody of deep space objects 24/7, through the solar exclusion gap. DARC will augment the SSN as an additional sensor with increased capacity and capability for deep space object custody, providing full global coverage. Funding transferred from program element 1206425SF in budget activity 04 in FY 2024.

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

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: DARC Site 1 Operational Capability	0.000	174.239	154.366
Description: The DARC Site 1 activity will develop, test, and deliver one DARC site with a current estimated completion date of FY 2026. It will also provide a foundation for up to two more future sites located strategically around the world to provide global deep space radar capability to support SDA. The system will be responsive to regularly scheduled and un-scheduled tasks to locate, identify, characterize deep space objects and report the results to Battle Management Command and Control locations and SSN.			
FY 2024 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206425SF / <i>Space Situation Awareness Systems</i>	Project (Number/Name) 656565 / <i>Ground Based SDA</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Continue Site 1 design and development activities including design reviews, hardware purchases, software development and integration, and construction. Continue construction of Site 1 including roads, buildings, utilities, foundation, and installation of all antenna structures. Perform additional site development efforts such as the construction of facility-support and site infrastructure to include backup generator buildings, fuel storage (tank farms), electrical substations for power site distribution, wastewater treatment/septic & leach, non-potable water storage/fire protection distribution (site & buildings), water treatment (potable) and physical security equipment to meet protection level 3 (PL3) requirements. Finalize plans for and begin implementing physical security for Site 1, to include any required equipment such as site perimeter fencing, and standalone fencing for both antenna arrays and site main power station to meet site safety requirements. Begin preparation for and install of fiber optics (COMM) as well as connection to existing and/or new infrastructure such as power grid, backup generators, and main water line. This is not a new start but a transfer of work that was previously funded in program element 1206425SF prior to FY 2024.</p> <p>FY 2025 Plans: Continue Site 1 construction, integration, software development and test. Complete the remainder of construction tasks and integration of all DARC subsystems, such as antennas, racks and operations consoles. Continue software development. Complete factory testing and demonstrations, and begin Developmental Test and Evaluation (DT&E).</p> <p>Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain and support USINDOPACOM activities. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to DARC site 1 construction progressing toward completion.</p>			
<p>Title: DARC Sites 2 and 3 Operational Capability</p> <p>Description: The program will develop, test, and deliver DARC sites 2 and 3 with a current estimated completion date of FY 2030. The system will be responsive to regularly scheduled and un-scheduled tasks to locate, identify, characterize deep space objects and report the results to Battle Management Command and Control locations and SSN.</p> <p>FY 2024 Plans: Begin Site 2 design and development activities including design reviews (Preliminary Design Review/Critical Design Review), hardware purchases, software development and integration, and construction. Initiate various pre-construction activities in preparation for full site construction. Finalize plans for and begin implementing physical security for Site 2, to include any required equipment such as site perimeter fencing, and standalone fencing for both antenna arrays and site main power station to meet site safety requirements. Begin preparation for and install of fiber optics (COMM) as well as connection to existing and/or new infrastructure such as power grid, backup generators, and main water line. Complete purchases for all long-lead facility equipment</p>	0.000	40.500	100.196

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206425SF / <i>Space Situation Awareness Systems</i>	Project (Number/Name) 656565 / <i>Ground Based SDA</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>for Site 2 as rapidly as possible in order to minimize schedule, these will have been initiated in parallel with completing required Environmental Analysis.</p> <p>Begin Site 3, Environmental Impact Assessment (EIA), Federal Aviation Agency (FAA) airspace negotiations and the security posture evaluation.</p> <p>FY 2025 Plans: Continue all Site 2 design and development activities, and complete Critical Design Review. Continue pre-construction activities. Prepare for connection of fiber optics (COMM) and infrastructure, such as power grid, backup generators, and main water line. Continue purchases for all Site 2 long-lead facility equipment such that they are initiated in parallel with completing required Environmental Analysis as rapidly as possible to minimize schedule.</p> <p>Continue Site 3 Environmental Assessment and begin pre-construction activities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased due to ramp up of Sites 2 and 3 activities.</p>			
Accomplishments/Planned Programs Subtotals	0.000	214.739	254.562

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

Project utilizes existing DoD engineering and study contracts and activities to conduct science and technology development and data analysis activities. Preliminary/critical design effort for the technology maturation and prototype commenced in FY 2017. A Broad Agency Announcement (BAA) was used to award seven Integrated System Engineering Team (ISET) contracts which allow for organizations to participate, advise the government, and gain insight into the prototype design and build. In May of 2019, DARC was designated as an MTA under Section 804 of the 2016 National Defense Authorization Act (NDAA). In 2020, DARC was directed to pursue a Rapid Prototyping Middle Tier Acquisition program for Site 1. The DARC Site effort will be executed through two separate contract elements: The Prime System Integrator (PSI) was awarded to Northrop Grumman Inc. via a single, competitive award through the Space Enterprise Consortium (SpEC) Other Transaction Authority (OTA) agreement. The DARC program will combine all three sites under a single program, prepare Sites 2 and 3 for the Major Capability Acquisition (MCA) pathway, and held an MCA Milestone C decision brief in February 2024 to transition Site 1 to MCA for the combined program. The SAE reviewed the draft acquisition strategy and based on compelling need to deliver this capability, waived the requirements in DAFI 63-101, paragraph 4.3.1, to approve the acquisition strategy prior to release of a formal solicitation for Sites 2 and 3.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force												Date: March 2024			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
3620F / 5				PE 1206425SF / Space Situation Awareness Systems				656565 / Ground Based SDA							
Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
DARC System Development Site 1	C/CPIF	Northrop Grumman : Colorado Springs, CO	-	-		147.642	Nov 2023	120.517	Oct 2024	-		120.517	Continuing	Continuing	-
DARC System Development Site 2/3	C/TBD	TBD : TBD	-	-		40.500	May 2024	100.196	Nov 2024	-		100.196	Continuing	Continuing	-
DARC Technical Mission Analysis	Various	Various : Various	-	-		6.381	Jan 2024	10.302	Jan 2025	-		10.302	Continuing	Continuing	-
SBIR/STTR	Allot	Not specified. : TBD	-	-		7.482	Oct 2023	9.164	Oct 2024	-		9.164	Continuing	Continuing	-
Subtotal			-	-		202.005		240.179		-		240.179	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
DARC Test Support	Various	Various : Various	-	-		1.932	Feb 2024	2.011	Feb 2025	-		2.011	Continuing	Continuing	-
Subtotal			-	-		1.932		2.011		-		2.011	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
A&AS	Various	Various : Various	-	-		8.347	Nov 2023	9.096	Nov 2024	-		9.096	Continuing	Continuing	-
FFRDC	RO	MITRE Corp : Colorado Springs, CO	-	-		2.355	Nov 2023	3.156	Nov 2024	-		3.156	Continuing	Continuing	-
Other Support	Various	Various : Colorado Springs, CO	-	-		0.100	Oct 2023	0.120	Oct 2024	-		0.120	Continuing	Continuing	-
Subtotal			-	-		10.802		12.372		-		12.372	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force								Date: March 2024			
Appropriation/Budget Activity 3620F / 5				R-1 Program Element (Number/Name) PE 1206425SF / <i>Space Situation Awareness Systems</i>				Project (Number/Name) 656565 / <i>Ground Based SDA</i>			
	Prior Years	FY 2023	FY 2024		FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals	-	-	214.739		254.562	-	254.562	Continuing	Continuing	N/A	

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force			Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206425SF / <i>Space Situation Awareness Systems</i>	Project (Number/Name) 656565 / <i>Ground Based SDA</i>	

	FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<i>Prototype Risk Reduction Build and Test</i>																												
Site 1 Software Development																												
Site 1 Development																												
Site 1 Construction																												
Site 1 Completion (Operational Leave Behind Capability)																												
Site 2 Contract Award																												
Site 2 Development																												
Site 2 Construction																												
Site 2 Completion (Operational Capability)																												
Site 3 Contract Award																												
Site 3 Development																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206425SF / <i>Space Situation Awareness Systems</i>	Project (Number/Name) 656565 / <i>Ground Based SDA</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Prototype Risk Reduction Build and Test</i>				
Site 1 Software Development	1	2024	2	2025
Site 1 Development	1	2024	1	2026
Site 1 Construction	1	2024	3	2025
Site 1 Completion (Operational Leave Behind Capability)	2	2026	2	2026
Site 2 Contract Award	3	2024	4	2024
Site 2 Development	3	2024	3	2028
Site 2 Construction	2	2026	3	2028
Site 2 Completion (Operational Capability)	4	2028	4	2028
Site 3 Contract Award	1	2028	1	2028
Site 3 Development	1	2027	4	2029

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206425SF / <i>Space Situation Awareness Systems</i>	Project (Number/Name) 65A006 / <i>Space Based SDA</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
65A006: <i>Space Based SDA</i>	-	93.914	115.636	178.100	0.000	178.100	167.595	153.081	44.756	31.148	0.000	784.230
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Space Domain Awareness (SDA) is one of five core competencies of the Space Force and is the effective identification, characterization, and understanding of any factor, passive or active, associated with the space domain that could affect space operations and thereby impact the security, safety, economy, or environment of our nation. As the foundation for space control, SDA encompasses surveillance of all space objects and activities; detailed surveillance of specific space assets; monitoring space environmental conditions; monitoring cooperative space assets; gathering indications and warning on adversary space operations; and conducting integrated command, control, communications, processing, analysis, dissemination, and archiving activities.

This program element develops new network sensors and improved information integration capabilities across the space surveillance network (SSN) while companion program element 1203940SF fields, upgrades, operationalizes, operates, and maintains Space Force sensors and information integration capabilities within the SSN. Activities funded in this program element (1206425SF) also support efforts such as engineering studies and analyses, architectural engineering studies, trade studies, technology needs forecasting, modernization initiatives, systems engineering, system development, and test & evaluation, and may include prototyping and technology demonstration.

Space Based SDA will develop and deliver a system to continue providing space object surveillance from space. The United States Space Force (USSF) and National Reconnaissance Office (NRO) have partnered on the Space Based SDA program to meet overlapping requirements. Space Based SDA enables timely detection and custody of on orbit threats in order to protect US High Value Assets in space in support of the National Defense Strategy.

Space Based SDA requirements are based on a Statement of Capabilities and upon the current Initial Capabilities Document architectural requirements focused on protecting High Value Assets. Space Based SDA will provide the capability to search, detect, and track objects from a space-based sensor for timely custody and event detection. Surveillance from space augments and overcomes existing ground sensor limitations with timely 24-hour above-the-weather collection of satellite metric data only possible with a space-based sensor. This data is communicated to operators at the Combined Space Operations Center (CSPOC), National Space Defense Center (NSDC), and other classified users. This project includes efforts related to Space Based SDA, its integration into the broader space superiority architecture, and analysis and experimentation to ensure space-based space surveillance capabilities against the evolving threat.

This project also evaluates affordable Space-Based SDA replenishment options to provide system resiliency and situational awareness necessary to operate in the contested space domain studies through technical analysis, risk reduction experiments, affordable prototyping, and partnership with Air Force Research Laboratory (AFRL). In addition, this program leverages opportunities for space-based commercial, international partnerships, and hosted payloads to support the SDA mission.

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206425SF / <i>Space Situation Awareness Systems</i>	Project (Number/Name) 65A006 / <i>Space Based SDA</i>
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This program element may include necessary civilian pay expenses required to manage, execute, and deliver Space Based SDA weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 1206392SF and 1206398SF. For Space Based SDA in PY 0.225M was expended for civilian pay expenses in this program element, and in CY 0.225M is forecasted for civilian pay expenses in this program element.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
<p>Title: Space-Based Space Domain Awareness (SDA)</p> <p>Description: SDA includes effective identification, characterization, and understanding of any factor, passive or active, associated with the space domain.</p> <p>Performs space-based SDA analysis, research, and development for the SILENTBARKER system in partnership with the NRO.</p> <p>FY 2024 Plans: Provide on-orbit support for SILENTBARKER Baseline in order to meet Initial Operational Capability (IOC). Continue development of SILENTBARKER Expansion increment to meet Full Operational Capability (FOC) for deep-space SDA. Continue implementation of mission data processing and data dissemination efforts supporting SILENTBARKER and other SDA prototyping efforts.</p> <p>Continue technology enhancements and prototyping efforts for space-based space domain surveillance against evolving threats, to include: future upgrades, extension and augmentations through analysis, demonstration, and experimentation. Prepare and conduct SDA hosted payload integration on a commercial host for launch in FY 2026. Additionally, FY 2024 funding will continue prototype efforts for SDA Hosted Payload (HP) efforts for a second prototype payload and expanded payload characterization tests. FY 2024 funding supports the launch and experiment operations for the AFRL and SSC partnership prototype programs such as the Oracle-M Defense Deep Space Sentinel (D2S2) satellites, enabling critical low-cost space based experimentation, expanding USSF SDA operations in Cislunar to counteract evolving threat activity. FY 2024 will continue activities for implementation of system resiliency and situational awareness necessary to operate in the contested space domain environment. In addition, FY 2024 will leverage opportunities for SDA space-based commercial, international partnerships, and AFRL partnerships. Activities may include, but are not limited to: studies, technical analysis, risk reduction, pre-acquisition activities, affordable prototyping, integration and test of command and control (C2), resiliency measures, mission partner interfaces, space test/combat range events and office support, etc.</p> <p>FY 2025 Plans: Continue development of SILENTBARKER Expansion increment to meet Full Operational Capability (FOC) for deep-space SDA. Continue implementation of mission data processing and data dissemination efforts supporting SILENTBARKER and other SDA prototyping efforts. Continue technology enhancements and prototyping efforts for space-based space domain surveillance against evolving threats, to include: future upgrades, extension and augmentations through analysis, studies, demonstration, and experimentation. Prepare and launch first SDA hosted payload (Oculus) on a commercial host. Additionally, FY 2025</p>	93.914	115.636	178.100

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206425SF / <i>Space Situation Awareness Systems</i>	Project (Number/Name) 65A006 / <i>Space Based SDA</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>funding will continue prototype/integration efforts for SDA Hosted Payload (HP) for the second prototype payload and expanded payload characterization tests. Activities will provide affordable gap filler for GEO based SDA. In addition, FY 2025 will leverage opportunities for SDA space-based commercial, international, and AFRL (Air Force Research Laboratory) partnerships. FY 2025 funding supports the launch, on-orbit experimentation, and operations for the AFRL and SSC partnership prototype programs such as the Oracle-Mobility (Oracle-M)/S6 satellites, enabling critical low-cost space-based experimentation, expanding USSF SDA operations in GEO and Cislunar space.</p> <p>FY 2025 will continue activities for implementation of system resiliency and situational awareness necessary to operate in the contested space domain environment. Activities may include, but are not limited to: program office support, studies, technical analysis, experimentation integration and test of command and control (C2), resiliency measures, mission partner interfaces, space test/combat range events and office support, etc.</p> <p>Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain, leveraging commercial and international opportunities, if appropriate. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased due to parallel efforts for SILENTBARKER Baseline on-orbit support, SILENTBARKER Expansion continued development and test, and SDA demonstration and experimentation activities including integration and preparations for launch of Oculus Hosted Payload Demo #1 on a commercial spacecraft.</p>			
Accomplishments/Planned Programs Subtotals	93.914	115.636	178.100

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Acquisition Strategy was approved to minimize the space-based SDA gap post-SBSS Block 10. SILENTBARKER baseline launched in FY 2023. The SBSS FO Materiel Development Decision was approved by the Milestone Decision Authority (MDA) on April 5, 2016. The Acquisition Strategy Panel was completed with the MDA on August 29, 2016. To satisfy the SDA architecture needs, the SBSS FO program requirements combined with an NRO program and were updated in the December 2017 SILENTBARKER Statement of Capabilities. The Space Force is partnered with the NRO on SILENTBARKER space segment and telemetry, tracking, and commanding (TT&C) program segments in order to further National Security Space objectives. Mutual investment for the non-recurring engineering (NRE) cost enables the potential for a larger initial constellation buy and lower unit costs. SILENTBARKER expansion contract was awarded Jun 2021 to extend capabilities past IOC.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force												Date: March 2024			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
3620F / 5				PE 1206425SF / Space Situation Awareness Systems				65A006 / Space Based SDA							
Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Space Based SDA Development	MIPR	Various : Various	-	85.937	Dec 2022	94.073	Dec 2023	155.258	Dec 2024	-		155.258	Continuing	Continuing	-
Space Based SDA Technical Mission Analysis	Various	Various : Various	-	1.486	Nov 2022	1.500	Nov 2023	1.200	Nov 2024	-		1.200	Continuing	Continuing	-
Space Based SDA Enterprise SE&I	Various	Various : Various	-	1.890	Nov 2022	1.450	Nov 2023	1.890	Nov 2024	-		1.890	Continuing	Continuing	-
Space Based SDA SBIR/ STTR	Allot	TBD : TBD	-	-		4.029	Oct 2023	6.412	Oct 2024	-		6.412	Continuing	Continuing	-
Subtotal			-	89.313		101.052		164.760		-		164.760	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Space Based SDA Civilian Reimbursable Budget Authority	RO	SSC : El Segundo, CA	-	0.000	Dec 2022	0.225	Dec 2023	0.225	Dec 2024	-		0.225	Continuing	Continuing	-
Subtotal			-	0.000		0.225		0.225		-		0.225	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Space Based SDA FFRDC	RO	Aerospace Corp : Los Angeles, CA	-	0.831	Nov 2022	0.900	Nov 2023	0.475	Nov 2024	-		0.475	Continuing	Continuing	-
Space Based SDA A&AS	Various	Various : Various	-	3.645	Jan 2023	13.119	Jan 2024	12.440	Jan 2025	-		12.440	Continuing	Continuing	-
Space Based SDA Other Support	Various	Various : Various	-	0.125	Mar 2023	0.340	Mar 2024	0.200	Mar 2025	-		0.200	Continuing	Continuing	-
Subtotal			-	4.601		14.359		13.115		-		13.115	Continuing	Continuing	N/A

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206425SF / <i>Space Situation Awareness Systems</i>	Project (Number/Name) 65A006 / <i>Space Based SDA</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>SILENTBARKER Baseline</i>				
Technology Development, Engineering and Manufacturing Development, Production	1	2023	2	2023
Pre-Ship Review	1	2023	2	2023
Available for Launch	4	2023	4	2023
On-orbit Support	4	2023	1	2028
<i>SILENTBARKER Expansion</i>				
Technology Development, Engineering and Manufacturing Development, Production	1	2023	2	2026
Critical Design Review (CDR)	1	2023	1	2023
Available for Launch	4	2026	4	2026
On-orbit Support	4	2026	4	2028
<i>SDA Hosted Payloads</i>				
Oculus Hosted Payload Phase 3 Demo #1	2	2023	2	2026
Oculus Hosted Payload Phase 3 Demo #2	3	2023	2	2026
Oculus Hosted Payload Demo #1 Launch	2	2026	2	2026
<i>AFRL-SSC Tech Demonstrations</i>				
AFRL-SSC Tech Demo S6/Oracle Mobility (Oracle-M) Launch	4	2025	4	2025

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 5					R-1 Program Element (Number/Name) PE 1206425SF / <i>Space Situation Awareness Systems</i>				Project (Number/Name) 65A037 / <i>Ground Based Optical Sensors</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
65A037: <i>Ground Based Optical Sensor</i>	-	0.000	42.452	50.943	0.000	50.943	12.775	0.000	0.000	0.000	0.000	106.170
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Ground Based Optical Sensor System (GBOSS) includes an upgrade to the Ground-based Electro-Optical Deep Space Surveillance (GEODSS) system which monitors small, closely-spaced, and advanced threats in low, mid, high, and geostationary orbits. The upgraded system will discover currently undetectable space threats, reduce an adversary's tactical surprise and deliver the data required to support accurate, timely, actionable SDA. This facilitates decision-making within the compressed timelines dictated by the realities of the congested, contested, competitive space domain. The program delivers a combination of performance upgrades to the existing White Sands Missile Range and Maui GEODSS sites, including advanced data exploitation and rapid data dissemination, and will incorporate coalition and commercial data to provide a global capability to positively identify an adversary committing an orbital attack. The program includes updates to the GEODSS image processing and optical subsystems that will enhance the sensitivity, resolution, search rate, detection processing, and extend the life of the GEODSS system.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Ground Based Optical Sensor System (GBOSS)	0.000	42.452	50.943
<p>Description: GBOSS provides a global, ground-based, optical sensor capability for Space Domain Awareness (SDA). The program implements advanced capabilities that may leverage coalition data, commercial data, and sophisticated exploitation algorithms to enhance system response and resiliency to operate in the contested space domain based on aggressive threats by our pacing-competitors, China and Russia. Ground Based Optical Sensor improves resolution, sensitivity, search rate, tracking of non-cooperative launches, precise tagging of clustered objects, detection of closely spaced dim objects, attribution of orbital attackers and delivers foundational technology to support data exploitation for advanced indications and warnings. This effort includes upgrading existing sensors, dissemination of all data to DoD and IC stakeholders via the Unified Data Library (UDL). The GBOSS acquisition is planned for four phases. Currently funded, Phase 1 upgrades the White Sands Missile Range (WSMR) and Maui sites. Phases 2 through 4 are not included in the current Acquisition Program Baseline (APB) and are unfunded. Phases 2 through 4 field Ground Based Optical Sensor capabilities to new locations in accordance with USSF Leadership direction. The future phases of the program may also acquire new advanced technology sensors to improve persistence and advanced multi-spectral data collection, enabling high-fidelity characterization and rapid attribution. The program will collaborate with Combined Space Operations Center (CSpOC), National Space Defense Center (NSDC), and National Air and Space Intelligence Center (NASIC) efforts to ensure enterprise data fusion and dissemination supporting Space Command and Control (Space C2).</p> <p>FY 2024 Plans:</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206425SF / <i>Space Situation Awareness Systems</i>	Project (Number/Name) 65A037 / <i>Ground Based Optical Sensors Systems</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Complete the installation, contractor verification testing, and developmental testing of the GEODSS Enhanced Tower (GET) upgrade at the WSMR GEODSS site. Prepare for deployment of GET materials needed to upgrade the Maui GEODSS site. Incorporate coalition and commercial data to mitigate the Atlantic Optical Gap. Incorporate commercial data to help mitigate optical sensor coverage gaps over the Atlantic and Indo-Pacific regions.</p> <p>FY 2024 funding will allow the program office to continue developing and fielding a resilient system necessary to operate in the contested space domain. Activities may include, but are not limited to: integration and test of command and control (C2) and mission partner interfaces, implementation of advanced data exploitation algorithms that may include pattern of life (PoL), advanced indications and warnings (I&W), enhanced defensive cyber operations resiliency measures, space test/combat range events, studies, technical analysis, risk reduction experiments, prototyping and program office support, etc.</p> <p>FY 2025 Plans: Complete contractor verification, developmental, and operational testing of the GEODSS Enhanced Tower (GET) upgrade at the WSMR GEODSS site leading to operational acceptance. Prepare and ship material, install and checkout GET towers at the GEODSS Maui site. Continue investment in commercial data to bolster United States Indo-Pacific Command (USINDOPACOM) efforts and to mitigate coverages in the Atlantic gap. FY 2025 funding will allow the program office to rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased due to simultaneous execution of GET upgrades at WSMR and Maui sites and investment in commercial data to fill gaps in areas of critical military needs.</p>			
Accomplishments/Planned Programs Subtotals	0.000	42.452	50.943

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

This program began in FY 2018 to address ground-based optical SDA gaps and shortfalls. The acquisition strategy, approved in March 2018, accelerates the development and fielding of the solution, minimizing the time to address the requirements in light of current and emerging threats. Initial Technology Maturation & Risk Reduction (TMRR) activities were executed using existing defense, intelligence, and lab contracts. Engineering & Manufacturing Development (EMD) activities are being executed on the Maintenance of Space Situational Awareness Integrated Capabilities (MOSSAIC) contract awarded through full and open competition.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206425SF / <i>Space Situation Awareness Systems</i>	Project (Number/Name) 65A037 / <i>Ground Based Optical Sensors Systems</i>
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
GBOSS Design, development and life extension	C/CPIF	L3 Harris : Colorado Springs, CO	-	-		32.768	Nov 2023	41.241	Nov 2024	-		41.241	Continuing	Continuing	-
GBOSS Testing	Various	Various : Various	-	-		1.000	Nov 2023	0.750	Nov 2024	-		0.750	Continuing	Continuing	-
GBOSS Technical Mission Analysis	RO	Various : Various	-	-		2.630	Nov 2023	3.424	Nov 2024	-		3.424	Continuing	Continuing	-
SBIR/STTR	Allot	Not specified. : TBD	-	-		1.479	Oct 2023	1.830	Oct 2024	-		1.830	Continuing	Continuing	-
Subtotal			-	-		37.877		47.245		-		47.245	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
A&AS	Various	Various : Various	-	-		2.200	Nov 2023	1.560	Nov 2024	-		1.560	Continuing	Continuing	-
FFRDC	RO	Various : Various	-	-		2.300	Nov 2023	2.038	Nov 2024	-		2.038	Continuing	Continuing	-
Other Support	C/CPAF	Various : Various	-	-		0.075	Nov 2023	0.100	Nov 2024	-		0.100	Continuing	Continuing	-
Subtotal			-	-		4.575		3.698		-		3.698	Continuing	Continuing	N/A

			Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	-	42.452	50.943	-	50.943	Continuing	Continuing	N/A

Remarks

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206425SF / <i>Space Situation Awareness Systems</i>	Project (Number/Name) 65A037 / <i>Ground Based Optical Sensors Systems</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>GBOSS Development</i>				
GET Engineering and Manufacturing Development (EMD)	1	2024	3	2026
Installation and Test at White Sands Missile Range	3	2024	2	2025
Operational Acceptance at White Sands Missile Range	3	2025	3	2025
Installation and Test at Maui	3	2025	3	2026
Operational Acceptance at Maui	4	2026	4	2026
Commercial Data	1	2024	4	2026

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206431SF / <i>Advanced EHF MILSATCOM (SPACE)</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	11.419	4.068	1.020	0.000	1.020	1.023	1.044	1.082	1.103	Continuing	Continuing
657104: <i>MILSATCOM Space Modernization Initiative (SMI)</i>	-	11.419	4.068	1.020	0.000	1.020	1.023	1.044	1.082	1.103	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Space Modernization Initiative (SMI) evolves current and future SATCOM systems to develop a more affordable and resilient integrated enterprise capable of meeting near-term and emerging requirements. Under this construct, SMI includes the Capabilities Insertion Program (CIP) to enhance the current Advanced Extremely High Frequency (AEHF) constellation and protected communications performance to improve system operational resiliency. Additionally, SMI will demonstrate technologies and Concepts of Operations (CONOPS) supporting the Protected Anti-jam Tactical SATCOM (PATS) family-of-systems capability that provides tactical-level military SATCOM (MILSATCOM) users protected, anti-jam SATCOM while operating in a contested environment. PATS is an integrated approach that includes the Protected Tactical Satellite Communications (PTS) and Protected Tactical Enterprise Service (PTES) programs to mitigate adversarial jamming effects by using the Protected Tactical Waveform (PTW). For this effort, SMI includes the Air Force - Army Anti-Jam Modem (A3M) to develop PTW-capable modems, providing high throughput and enhanced anti-jam capability in benign and contested environments. Finally, Global Broadcast Service (GBS) functionality will be added to the PATS modems. GBS implements a worldwide high-capacity satellite broadcast information system to provide a continuous, one-way, high-speed, high-volume flow of classified and unclassified intelligence products (full motion video, imagery, data) to garrisoned, deployed or moving forces. FY 2022 was the final year of funding for CIP. FY 2025 funding continues the GBS effort.

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

This program is in Budget Activity 5, System Development and Demonstration (SDD) because it has passed Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full rate production.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 1206431SF I Advanced EHF MILSATCOM (SPACE)
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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	11.651	4.068	1.018	0.000	1.018
Current President's Budget	11.419	4.068	1.020	0.000	1.020
Total Adjustments	-0.232	0.000	0.002	0.000	0.002
• 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	-0.232	0.000			
• Other Adjustments	0.000	0.000	0.002	0.000	0.002

Change Summary Explanation

FY 2025: +0.002M Inflation Rates for Non-Pay and Non-Fuel Purchases

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Title: Global Broadcast Service (GBS)</p> <p>Description: GBS continues A3M efforts towards meeting integration and mission requirements for Combat Communications users. This includes completing A3M software/firmware updates and integrating the modem into the GBS receive suites, which will allow the modem to be compatible with the GBS legacy Digital Video Broadcast - Second Generation Satellite (DVB-S2) broadcast and switchable between legacy DVB-S2 and PTW capabilities. This ensures the 2,000+ worldwide GBS users continue to have access to continuous, one-way, high-speed, high-volume flow of classified and unclassified intelligence products (full motion video, imagery, data, weather, etc.) during the 5-year fielding timeline. Upon fielding completion, GBS users will transition to a PATS broadcast. This will fulfill the GBS TRANSEC requirement in the GBS Joint Operational Requirements Document (JORD)-III (2005) and Committee on National Security Systems (CNSS) Policy No. 12/CNSS Instruction No.1200. This solution also supports the Chief Space Operations' SATCOM Vision for improved resiliency and agility.</p> <p>FY 2024 Plans: Continue A3M software/firmware updates through one of the current A3M Development vendors to add GBS legacy DVB-2 broadcast compatibility. Funding will also integrate A3M with GBS receive suites (physical integration, technical order updates, training package updates, software updates, etc.). Continue Satellite Broadcast Manager (SBM) architecture updates for PATS compatibility. Continue initial test activities to include planning and acquisition of test assets. Activities include, but are not limited to, program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p>FY 2025 Plans:</p>	11.419	4.068	1.020

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206431SF / <i>Advanced EHF MILSATCOM (SPACE)</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Continue A3M software/firmware updates through the selected A3M Development vendors to add GBS legacy DVB-S2 broadcast compatibility for garrisoned, deployed or moving forces with A3M modem and small form factor modem. Funding will also integrate A3M with GBS receive suites, concentrating on technical baseline updates for physical integration, technical order updates, training package updates, software updates, and other critical technical baseline updates in preparation for full rate production. Remaining RDT&E funding through the FYDP will support necessary software corrections, address cybersecurity considerations, and finalize integration efforts. Continue SBM architecture updates for PATS compatibility. Continue test activities to include planning, acquisition of test assets and test conduct.</p> <p>Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to completion of the majority of the A3M modem software/firmware updates.</p>			
Accomplishments/Planned Programs Subtotals	11.419	4.068	1.020

D. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u> <u>Base</u>	<u>FY 2025</u> <u>OCO</u>	<u>FY 2025</u> <u>Total</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>FY 2029</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• SPSF 01 MILSAT: <i>MILSATCOM</i>	17.338	23.703	17.159	-	17.159	4.539	4.661	4.760	3.769	0.000	75.929

Remarks
The MILSATCOM Procurement Space Force (PSF) funds the production costs of the A3M for GBS.

The above costs reflect the GBS and PTW Modem line item totals (omitting the Air Force Wideband Enterprise Terminal (AFWET) line item costs) of the 3022F: Procurement, Space Force MILSAT / MILSATCOM document.

E. Acquisition Strategy
A3M is an ACAT III program and is a joint effort between SSC and the Program Manager (PM) Tactical Networks (TN), Aberdeen Proving Ground (APG), to develop a common modem for the United States Air Force Global Multi-band Terminal (GMT) and United States Army Satellite Transportable Terminal (STT).

The Space Force will utilize existing contracts to the fullest extent possible for all updates necessary. Those contracts include: Air Force Research Laboratory (AFRL) contracts for software/firmware updates; GBS receive suite contracts for terminal integration; GBS architecture sustaining engineering contract for SBM updates; and an existing service level agreement with the 520th Software Engineering Squadron (SWES) for receive suite and SBM software updates. Within the CIP effort, the W/V-

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity	R-1 Program Element (Number/Name)
3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	PE 1206431SF / <i>Advanced EHF MILSATCOM (SPACE)</i>

band Satellite Communication Experiment Transponder (WSCE-T) program's W/V frequency utilization demonstration was a cost-shared venture between the Program Office and the AFRL.

Leveraging similar mission and environmental requirements enables selection of the high water mark requirements to meet both mission parameters with greater efficiency while reducing risk and lifecycle cost. A3M leverages the PTS Field Demonstration technology maturation resulting in a low-risk development effort delivering pre-production modems with 100% production-ready components. This will include certified End Cryptographic Units (ECUs) for full-scope operational and cyber testing, operator and maintainer training materials, and all required intellectual property rights and provisioning documentation to enable swift terminal modification for operational use and sustainment. The development phase will deliver pre-production PTW-capable modems ready for "build-to-print" production. Blended developmental and operational testing is expected to include full environmental, blue, and red team testing prior to the production decision.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force												Date: March 2024			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
3620F / 5				PE 1206431SF / Advanced EHF MILSATCOM OM (SPACE)				657104 / MILSATCOM Space Modernization Initiative (SMI)							
Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
GBS-A3M Software/Firmware Design Changes	C/CPFF	Various : Various	-	8.701	May 2023	1.500	Nov 2023	0.783	Nov 2024	-		0.783	Continuing	Continuing	-
GBS Receive Suite Integration	C/Various	Various : Various	-	0.673	May 2023	2.355	Oct 2023	0.200	Oct 2024	-		0.200	Continuing	Continuing	-
GBS SBIR/STTR	Various	Various : Various	-	-		0.142	Mar 2024	0.037	Mar 2025	-		0.037	Continuing	Continuing	-
GBS Enterprise SE&I	C/CPAF	Linquest : Los Angeles, CA	-	0.600	May 2023	-		-		-		-	0.000	0.600	-
Subtotal			-	9.974		3.997		1.020		-		1.020	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
GBS DT/IT/OT Resources	Various	Peterson / Schriever SFB : CO Springs, CO	-	1.268	Jun 2023	-		-		-		-	Continuing	Continuing	-
Subtotal			-	1.268		-		-		-		-	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
GBS A&AS	Various	Various : Various	-	0.177	Apr 2023	0.053	Jan 2024	-		-		-	Continuing	Continuing	-
GBS Other Support	Various	Various : Various	-	-		0.018		-		-		-	Continuing	Continuing	-
Subtotal			-	0.177		0.071		-		-		-	Continuing	Continuing	N/A
Project Cost Totals			-	11.419		4.068		1.020		-		1.020	Continuing	Continuing	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206431SF / <i>Advanced EHF MILSATCOM (SPACE)</i>	Project (Number/Name) 657104 / <i>MILSATCOM Space Modernization Initiative (SMI)</i>

	FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<i>MILSATCOM Space Modernization Initiative</i>																												
A3M PTW Modem Development																												
GBS-A3M SW/FW design changes																												
GBS Test Planning and DT/IT/OT																												
GBS SBM and TGRS Integration (Receive Suite Integration)																												
GBS PRS Integration																												
GBS DR Resolution																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206431SF / <i>Advanced EHF MILSATCOM (SPACE)</i>	Project (Number/Name) 657104 / <i>MILSATCOM Space Modernization Initiative (SMI)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>MILSATCOM Space Modernization Initiative</i>				
A3M PTW Modem Development	1	2023	1	2024
GBS-A3M SW/FW design changes	1	2024	2	2025
GBS Test Planning and DT/IT/OT	3	2023	4	2029
GBS SBM and TGRS Integration (Receive Suite Integration)	3	2023	4	2029
GBS PRS Integration	3	2024	2	2026
GBS DR Resolution	3	2025	2	2028

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206432SF / <i>Polar MILSATCOM (SPACE)</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	193.076	65.028	73.757	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	331.861
654215: <i>EPS Recap</i>	193.076	65.028	73.757	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	331.861
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

Program MDAP/MAIS Code: 121

Note
 PE 1206432SF (Polar MILSATCOM Space)/Project 654215 EPS Recap funding completed in FY 2024. Due to additional launch delays from the payload host, payload on-orbit testing, operational utility evaluation, and operations acceptance will occur in FY 2025. EPS-R procured Family of Advanced Beyond Line-of-Sight Terminals (FAB-Ts) software will be developed and certified in FY 2024 with terminal installation and checkout occurring in FY 2025.

A. Mission Description and Budget Item Justification
 This program element acquires the Polar Military Satellite Communications (MILSATCOM) system that provides protected communications (anti-jam and low probability of intercept and detection) for users in the North Polar Region.

In FY 2006, the Department of Defense (DoD) began funding Enhanced Polar System (EPS). The host spacecraft and the polar communications packages took advantage of the Advanced Extremely High Frequency (AEHF) technology including the extended Data Rate (XDR) waveform. The EPS Capability Development Document (CDD), approved by the Joint Requirements Oversight Council in September 2006, is based on a two-package, hosted XDR program with operational availability in CY 2015 and CY 2017. EPS is comprised of four segments: Payload, Ground Control, Gateway, and Terminal (acquired by each Service's Terminal Program Office). Milestone B review was completed April 2, 2014.

In FY 2019, the United States Air Force (USAF) and Norwegian Ministry of Defense signed the Arctic Memorandum of Agreement (MOA), which enforces the international collaboration with Norway to host two EPS-Recapitalization (EPS-R) payloads on Space Norway-procured spacecraft. EPS-R continues to develop and acquire two Extremely High Frequency (EHF) payloads hosted on Space Norway-procured spacecraft and to upgrade/modify the existing EPS Ground Control and Gateway.

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

This program is in Budget Activity 5, System Development and Demonstration (SDD) because it has passed Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full rate production.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 1206432SF I Polar MILSATCOM (SPACE)
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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	67.215	73.757	0.000	0.000	0.000
Current President's Budget	65.028	73.757	0.000	0.000	0.000
Total Adjustments	-2.187	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	-2.187	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Title: Space Segment</p> <p>Description: Develop and acquire two EHF payloads, using AEHF's XDR waveform, for integration on host spacecraft.</p> <p>FY 2024 Plans: Finalize coordination between Space Norway, space vehicle vendor, and payload contractor. Provide representation, technical expertise, and assistance as necessary at space vehicle vendor facilities to support activities including payload integration, testing, and deficiency resolution as needed. Support segment and system level testing. Lead launch activities including launch base processing, rehearsals, initialization, calibrations, testing and activation of the EPS-R payloads. Complete cyber certification and evaluation efforts. Manage readiness of the Engineering Model Test Bed, Hosted Payload Interface Unit, XDR Processing Unit test beds, flight software and databases.</p> <p>FY 2025 Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to program funding ending in FY 2024.</p>	20.651	22.366	0.000
<p>Title: Ground Updates</p> <p>Description: Modify and upgrade the existing EPS Control and Planning Segment (CAPS) to provide command and control and XDR mission planning capability for the two new payloads.</p> <p>FY 2024 Plans:</p>	35.374	45.549	0.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206432SF / <i>Polar MILSATCOM (SPACE)</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Complete on-orbit testing with EPS CAPS. Complete efforts with Defense Information Systems Agency (DISA) on ground nodes to provide out-of-band connectivity to the EPS-R payload as well as in-band connectivity between EPS-R ground nodes. Provide representation, technical expertise, and assistance as necessary at Space Norway and/or space vehicle vendor facilities to support activities including payload integration and ground to payload testing. Support segment and system level testing. Complete cyber certification and evaluation efforts. Provide updates, fixes, and retests to ground software deficiencies found in Site Acceptance Testing and On-orbit Testing. Complete CAPS integration activities with the Family of Advanced Beyond Line-of-Sight Terminals (FAB-Ts). Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p>FY 2025 Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to program funding ending in FY 2024.</p>			
<p>Title: Gateway Updates</p> <p>Description: Modify and upgrade the existing EPS Gateway to support the two new payloads.</p> <p>FY 2024 Plans: Complete EPS Gateway upgrades, segment, and system integration testing. Complete terminal support as required by System-level or Integration tests. Complete software modifications for FAB-Ts and install the two FAB-T terminals and towers/shelters to augment the two aging T&C-T at Clear Space Force Station.</p> <p>FY 2025 Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to program funding ending in FY 2024.</p>	9.003	5.842	0.000
Accomplishments/Planned Programs Subtotals	65.028	73.757	0.000

D. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206432SF / <i>Polar MILSATCOM (SPACE)</i>
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E. Acquisition Strategy

Awarded payloads contract to Northrop Grumman Aerospace Systems (NGAS) and initiated fabrication of two EPS functional-equivalent payloads in FY 2018. In FY 2019, the USAF and Norwegian Ministry of Defence signed the Arctic Memorandum of Agreement, which enforces the international collaboration with Norway to host the two EPS-R payloads on the Space Norway-procured spacecraft. Conducted market research to identify industry capabilities and acquisition concepts. Awarded CAPS contract for EPS ground upgrade. Gateway updates will be accomplished by Naval Information Warfare Center Pacific, the EPS Gateway Segment developer. The program office initiates the procurement of a replacement terminal for the Telemetry and Command Terminal. This acquisition strategy updates the EPS Ground Segment to accommodate the EPS functional equivalent payloads and extend operations and sustainment beyond CY 2028. The U.S. Government will retain the system integrator role, as it was for EPS program of record.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force												Date: March 2024			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
3620F / 5				PE 1206432SF / Polar MILSATCOM (SPA CE)				654215 / EPS Recap							
Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
EPS-R Tactical Payloads	SS/CPIF	NGAS : Redondo Beach, CA	80.317	16.878	Nov 2022	19.335	Nov 2023	-		-		-	0.000	116.530	505.355
EPS-R Control and Planning Segment Upgrades	SS/CPIF	NGMS : Redondo Beach, CA	45.880	28.911	Nov 2022	36.792	Nov 2023	-		-		-	0.000	111.583	115.710
EPS-R Gateway Upgrades	Various	Various : Various, CA	19.404	7.358	Nov 2022	5.050	Nov 2023	-		-		-	0.000	31.812	68.895
EPS-R SBIR/STTR	TBD	Various : Various, CA	0.000	-		2.581		-		-		-	0.000	2.581	-
EPS-R Technical Mission Analysis	RO	Aerospace : El Segundo, CA	10.794	1.815	Nov 2022	1.835	Nov 2023	-		-		-	0.000	14.444	-
EPS-R Enterprise SE&I	C/CPAF	LinQuest : Los Angeles, CA	30.476	6.955	Nov 2022	5.000	Nov 2023	-		-		-	0.000	42.431	-
Subtotal			186.871	61.917		70.593		-		-		-	0.000	319.381	N/A
Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
EPS-R FFRDC	RO	Aerospace : El Segundo, CA	1.544	-		-		-		-		-	0.000	1.544	-
EPS-R A&AS	Various	Various : Various	4.447	2.961	Oct 2022	3.014	Oct 2023	-		-		-	0.000	10.422	-
EPS-R Other Support	Various	Various : Various	0.214	0.150	Oct 2022	0.150	Oct 2023	-		-		-	0.000	0.514	-
Subtotal			6.205	3.111		3.164		-		-		-	0.000	12.480	N/A
Project Cost Totals			193.076	65.028		73.757		-		-		-	0.000	331.861	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206432SF / <i>Polar MILSATCOM (SPA CE)</i>	Project (Number/Name) 654215 / <i>EPS Recap</i>

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Space Segment	
International Collaboration w/Norway	
Space Vehicle Integration/Test/Check-out	
Ground and Gateway Upgrades/ Modifications	
Risk Reduction Activities/Studies	
Acquire Telemetry and Control Terminals	
Upgrades/Modifications	
System Level Integration and Test	
Control Terminal Installation	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206432SF / <i>Polar MILSATCOM (SPA CE)</i>	Project (Number/Name) 654215 / <i>EPS Recap</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Space Segment				
International Collaboration w/Norway	1	2023	3	2024
Space Vehicle Integration/Test/Check-out	1	2023	4	2024
Ground and Gateway Upgrades/Modifications				
Risk Reduction Activities/Studies	1	2023	2	2024
Acquire Telemetry and Control Terminals	1	2023	2	2024
Upgrades/Modifications	1	2023	4	2024
System Level Integration and Test	1	2023	4	2024
Control Terminal Installation	1	2024	4	2024

Note

Due to additional launch delays from the payload host, payload on-orbit testing, operational utility evaluation, and operations acceptance will occur in FY 2024.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206433SF / <i>Wideband Global SATCOM (SPACE)</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	46.618	49.445	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
657107: <i>WGS Space Systems Resiliency Upgrade</i>	-	46.618	49.445	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Wideband Global SATCOM (WGS) System provides the Department of Defense (DoD) with high data rate military satellite communication (MILSATCOM) services in accordance with the Joint Space Management Board-approved MILSATCOM architecture (August 1996), the Joint Requirements Oversight Council (JROC)-approved MILSATCOM Capstone Requirements Document (October 1997), and JROC-approved WGS Operational Requirements Document (May 2000). Dual-frequency WGS satellites augment, then replace the DoD's Defense Satellite Communications System X-band service and augment one-way Global Broadcast Service Ka-band capabilities. In addition, WGS provides a high capacity two-way Ka-band Service. This program was originally conceived to augment the near-term "bandwidth gap" in warfighter communications needs but it remains to be the DoD's primary wideband system. WGS has 10 operational legacy satellites and WGS-11 and WGS-12 (WGS-11 & 12) are in development as the first modern digital payloads using commercial technologies providing more coverage beams than their existing WGS predecessors combined and delivering twice the operational capacity than previous WGS analog satellites. Funding for this effort supports the advanced capabilities for WGS-11 & 12 under development for launch in FY 2025 and FY 2027, respectively. Project 657107, WGS Space Systems Resiliency Upgrade, is for WGS Beam Optimization & Operational Management (WGS-BOOM) enhancements to maximize efficiency/warfighter use of the additional number of beams provided by WGS-11 & 12 by improving the functionality of the legacy WGS ground systems to rapidly change the planned coverage scheme.

The 10 operational legacy WGS satellites on-orbit were each developed by building on heritage WGS capabilities. Continually improving WGS capability and leveraging advances in Boeing commercial technology, in FY 2018 the DoD has procured a more advanced single WGS-11 satellite (previously referenced as WGS-11+ to designate meeting the Congressional intent of two satellites, herein referenced as WGS-11 with the new Congressional add of WGS-12) enhancing support to the US military, DoD, and allied nations with more flexibility and mission capacity to support dispersed users than previous WGS spacecraft. The new capabilities allow operators to create unique coverage anywhere within the satellite's field of view and custom designed for the mission at hand. In FY 2024, the DoD will procure a WGS-12, an expected clone of the WGS-11 spacecraft with the Protected Tactical SATCOM (PTS) as a hosted payload. WGS-12 will be added to the WGS Block II Follow On (B2FO) contract and is supported by current work on WGS-BOOM enhancements. The advanced beam management capabilities of WGS-11 & 12 payloads will produce more coverage beams (over 1500) than the entire existing WGS constellation and deliver twice the mission capacity than WGS-10 can, thereby operationally increase the availability of military-grade communications.

The objective of the WGS-BOOM effort is for the development, integration, and test of advanced beam management to enhance WGS-11 & 12 baseline beam management tools in support of rapid planning and control. This effort will develop and deploy capabilities across the WGS enterprise to provide WGS-11 & 12 management and control (M&C) ground enhancements with responsive end-to-end mission planning, protection, and terminal synchronized capabilities. WGS BOOM development includes upgrades to the WGS-11 & 12 payload control system, Global SATCOM Configuration Control Element (GSCCE), to decrease operational

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206433SF / <i>Wideband Global SATCOM (SPACE)</i>
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timelines to be able to better track and support airborne ISR missions as they move through the theater. Additionally, a Power Control Management Subsystem (PCMS) will be developed to provide superior situational awareness of user resource usage as well as automated configuration capability to restore users. Finally, a classified version of the WGS planning system, Common Network Planning Software (CNPS), will be developed to act as an automated source of truth for classified missions, which would reduce resource planning timelines. Funding the engineering and development for enhanced element M&C will provide greater routing complexity and mission planning flexibility to support 80 times more X and Ka-band spot beams on WGS-11 & 12 than on WGS 1-10 spacecraft. This funding will be used to develop and integrate WGS-11 & 12 advanced beam management capabilities & power control capabilities facilitating contested and mobile operations on tactically relevant timescales. Updated WGS-11 & 12 M&C interfaces will improve planning data responsiveness through access to automated equipment configuration registries and enable WGS-11 & 12 integration into the broader DoD SATCOM Enterprise. External WGS-11 & 12 interfaces may be leveraged to support planning, situational awareness, power control, and real time equipment orchestration.

WGS Block I consists of satellites 1-3, Block II consists of satellites 4-6 and B2FO currently includes satellites 7-10 and plans to add WGS 11 & 12 in FY 2023. WGS satellites 1-10 have been funded, procured and launched in previous budget cycles. With the operation of WGS-5, the constellation provided global coverage and Full Operational Capability (FOC) was declared on 12 May 2014.

In the Consolidated Appropriations Act, FY 2018, Congress added \$600M Space Force Procurement in FY 2018 for "full funding for WGS-11 and WGS-12." A sole source Request for Proposal was released to Boeing in June 2018. A final decision was made to procure a single satellite (once designated as WGS-11+ but will herein forward be referenced as WGS-11) with twice the operational capacity of WGS-10 as the best approach to delivering the directed additional WGS capacity in a cost-effective manner. WGS-11 will host a PTS payload providing robust anti-jam capability to tactical warfighters, funded by the PTS program in PE 1206761SF.

In the Consolidated Defense Appropriations Act, FY 2023, Congress added \$442M Space Force Procurement in FY 2023 for "Protected Wideband Satellite" to procure a protected wideband satellite providing resilient, jam resistant tactical communications to support warfighter needs. The United States Space Force (USSF) has interpreted the Congressional add is intended to procure a WGS-12 satellite equipped with the tactical anti-jam capabilities delivered with WGS-11 with the PTS hosted payload. The funding is expected to cover costs for a WGS-12 spacecraft clone of the WGS-11 to include a PTS hosted payload. The current B2FO Acquisition Program Baseline (APB) allows for procurement of a WGS-12 and the acquisition is planned to be a Firm Fixed Price effort with integration of PTS in FY 2026 and launch in FY 2027. The Congressional add does not include funding for ground, launch and operation/maintenance activities. USSF is pursuing a mix of USSF and International Partner (IP) sources to cover additional funding required by FY 2025 for launch vehicle, ground and other Government costs.

IPs receive constellation-wide WGS resources commensurate with their financial contributions to the WGS system. Investment from IPs to cooperatively enhance the system started in November 2007 through a bilateral Memorandum of Understanding (MOU) with Australia to fund WGS space vehicle (SV)-6, launch and launch services. Five countries (Canada, Denmark, Netherlands, Luxembourg, New Zealand) signed a new multilateral WGS MOU in CY 2012 and funded the procurement of WGS SV-9. In CY 2017, Amendment One to the WGS MOU leveraged additional funding for resiliency enhancements from two new IPs (Czech Republic and Norway). There is an International Agreement via the State Department regarding IP collaboration with WGS-11. In May 2022, nine countries signed Amendment Two to the multilateral MOU (adds Belgium and United Kingdom) to cover necessary ground upgrades and launch costs for WGS-11 was not covered by the FY 2018 Congressional add, and extends the duration of the WGS MOU, as amended, through September 2039. Space Systems Command (SSC) provides program

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206433SF / <i>Wideband Global SATCOM (SPACE)</i>
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management, integration, and engineering expertise through FY 2026. Discussions for potential future partnerships regarding the WGS program continue in support of National Space Policy and improved operational efficiency.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver WGS-11 & 12 for weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 1206392SF and 1206398SF.

This program is in Budget Activity 5, System Development and Demonstration (SDD) because it has passed Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full rate production.

B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	48.288	49.445	0.000	0.000	0.000
Current President's Budget	46.618	49.445	0.000	0.000	0.000
Total Adjustments	-1.670	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	-1.670	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

Change Summary Explanation

FY 2023 change from previous to current President's Budget is due to SBIR/STTR Transfer

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
Title: WGS Beam Optimization & Operational Management (BOOM) Planning Development, Systems Integration, and Test	2.675	7.240	0.000
Description: Develop and integrate WGS-11 & 12 advanced beam management capabilities driving improved warfighter ability to rapidly re-plan WGS-11 & 12 expanded coverage. Mature technical baseline and interface requirements for BOOM. Perform as the Government systems integrator through acquiring, designing, testing, and integrating the three key BOOM development segments and external interfaces with WGS. Support, configure, and conduct integrated testing of GSCCE, CNPS, and PCMS BOOM development efforts. Manage the MILSATCOM system architecture, refine interface requirements, and validate concept of operations through integrated system performance demonstrations. Leverage external WGS-11 & 12 interfaces to test and support planning, situational awareness, power control, and real time equipment orchestration.			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206433SF / <i>Wideband Global SATCOM (SPACE)</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
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<p>FY 2024 Plans: Continue plans to support the mission planning, integration and test of the three key BOOM development efforts (GSCCE, CNPS, and PCMS) and beam management products within the DoD SATCOM Enterprise, to including software specifications to program shaped beams supporting MILSATCOM service topologies. Provide GSCCE & PCMS support in preparation for a parallel on-orbit checkout during WGS-11 on-orbit checkout in FY 2025. Manage interface requirements to externally managed enhancements, such as Enterprise Management & Configuration (EM&C) and SATCOM Ordering, Management, and Situational Awareness Tools (SOMSAT). Activities may include, but are not limited to: program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p>FY 2025 Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to completion of the BOOM effort.</p>			
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<p>Title: WGS-BOOM Development - Global SATCOM Configuration Control Element (GSCCE)</p> <p>Description: WGS-BOOM-GSCCE is one of three BOOM development efforts to best improve the beam management panning ability for WGS-11 & 12 missions. GSCCE is an existing ground system with Boeing that performs payload commanding at all five of the Wideband SATCOM Operations Centers (WSOCs). WGS-BOOM-GSCCE development upgrade will reduce commanding/commit time due to increased commanding pace as a result of additional users/beams on WGS-11 & 12. This will result in the ability to rapidly plan WGS-11 & 12 missions.</p> <p>FY 2024 Plans: Continue efforts to provide automation functions for payload planning/control in support of WGS-11 & 12. Continue to leverage existing GSSCE contract that commands and establishes WGS payload for operations, for development upgrades. Continue the design and development phase with the focus on advanced beam management and ensuring mobile operations with tactically relevant timelines. Refactor GSCCE payload plan commit time, improve WSOC handover times, and improve other GSCCE functionality for faster commanding of beam repoints supporting user movement in theater. Prepare for parallel verification testing during WGS-11 on-orbit checkout in FY 2025. Implement risk mitigations, such as modifying legacy code or introducing new code and processes into a legacy system and ensure compatibility. Procure GSCCE licenses and infrastructure to address the WGS-11 baseline obsolescence gap during the WGS-11 transition period. Ensure interfaces like CNPS and WSTARS are compatible with new GSCCE capability. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p>FY 2025 Plans:</p>	25.459	0.000	0.000
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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>		R-1 Program Element (Number/Name) PE 1206433SF / <i>Wideband Global SATCOM (SPACE)</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
N/A				
FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to completion of the BOOM effort.				
Title: WGS-BOOM Development - Consolidated Network Planning System (CNPS)		0.000	10.000	0.000
Description: CNPS is an existing ground system with Northrup Grumman Corporation (NGC) that performs WGS payload planning, allocating users to beams, at all five WSOCs and also at the Regional SATCOM Support Centers (RSSCs). WGS-BOOM-GSCCE is one of three BOOM development efforts to best improve the ability to rapidly plan WGS-11 & 12 missions. WGS-BOOM-CNPS development will upgrade CNPS planning in a higher classification and enable automated mission checks of redacted mission information, eliminating current manual processes for users at different classification levels.				
FY 2024 Plans: Complete acquisition for PCMS enhancement and award contract from an open competition to commence PCMS design and development phase. Support power control and management interface capability with terminals to implement automated configuration, control and monitoring for rapid re-planning. PCMS will enhance elements along both the mission planning and then mission execution timelines along with early indication of issues to support continuation or restoral of services. Document interface requirements for terminals to be compatible with PCMS. Preparation activities to prepare for a parallel verification testing during WGS-11 on orbit checkout in FY 2025. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc.				
FY 2025 Plans: N/A				
FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to completion of the BOOM effort.				
Title: WGS-BOOM Development - Power Control Management Subsystem (PCMS)		18.484	32.205	0.000
Description: WGS-BOOM-PCMS is one of three BOOM development efforts to best improve the ability to rapidly plan WGS-11 & 12 missions. PCMS will establish machine-to-machine connection to terminals to provide automated RF configuration management when problems are indicated and rapid restoral of services to begin before operators identify a discrepancy.				
FY 2024 Plans: Complete acquisition for PCMS enhancement and award contract from an open competition to commence PCMS design and development phase. Support power control and management interface capability with terminals to implement automated configuration, control and monitoring for rapid re-planning. PCMS will enhance elements along both the mission planning and then				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206433SF / <i>Wideband Global SATCOM (SPACE)</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
mission execution timelines along with early indication of issues to support continuation or restoral of services. Document interface requirements for terminals to be compatible with PCMS. Preparation activities to prepare for a parallel verification testing during WGS-11+ on orbit checkout in FY 2025. Activities may include, but are not limited to: program office support, studies, technical analysis, experimentation, prototyping, etc.			
FY 2025 Plans: N/A			
FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to completion of the BOOM effort.			
Accomplishments/Planned Programs Subtotals	46.618	49.445	0.000

D. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u> <u>Base</u>	<u>FY 2025</u> <u>OCO</u>	<u>FY 2025</u> <u>Total</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>FY 2029</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• SPSF 01 GAP000: <i>Wideband Gapfiller Satellites (Space)</i>	463.982	-	10.000	-	10.000	-	-	-	-	0.000	473.982

Remarks

E. Acquisition Strategy
WGS-BOOM development strategy strives to provide WGS enterprise enhancements efficiently using existing designs with reduced non-recurring engineering by leveraging, where possible, existing contracts and government relationships. To maximize resourced efforts and meet the speed of need, this strategy to initiate BOOM development enhancements relies heavily on work already being performed by the USSF and U.S Army to support WGS-11 launch in FY 2025 and WGS-12 launch in FY 2027. Award modifications to the existing Firm-Fixed Price (FFP) contracts for GSCCE and CNPS BOOM enhancements to Boeing in FY 2023 (USSF contract) and Northrup Grumman Corporation (NGC) (USA contract) in FY 2024, respectively, to leverage existing USA contracts with each respective Prime contractor for ongoing baseline GSCCE and CNPS system upgrades needed to add WGS-11 & 12 to the WGS constellation. The PCMS enhancement was competitively awarded in November 2023 (FY 2024).

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206433SF / <i>Wideband Global SATC OM (SPACE)</i>	Project (Number/Name) 657107 / <i>WGS Space Systems Resiliency Upgrade</i>
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
WGS-BOOM Planning Development, Systems Integration and Test	Various	Various : Various	-	1.938	Apr 2023	2.223	Jan 2024	-		-		-	0.000	4.161	-
WGS-BOOM - GSCCE	SS/FFP	Boeing : El Segundo, CA	-	25.459	Sep 2023	-		-		-		-	0.000	25.459	-
WGS-BOOM - CNPS	SS/FFP	NGC : Orlando, FL	-	-		10.000	Mar 2024	-		-		-	0.000	10.000	-
WGS-BOOM - PCMS	C/TBD	TBD : TBD	-	18.484	Nov 2023	32.000	Jan 2024	-		-		-	0.000	50.484	-
SBIR/STTR	Allot	Various : TBD	-	-		1.731	Mar 2024	-		-		-	0.000	1.731	-
Technical Mission Analysis	RO	Aerospace : El Segundo, CA	-	-		0.865	Jan 2024	-		-		-	0.000	0.865	-
SE&I	C/FP	Linquest : El Segundo, CA	-	-		0.820	Jan 2024	-		-		-	0.000	0.820	-
Subtotal			-	45.881		47.639		-		-		-	0.000	93.520	N/A

Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
A&AS	Various	Various : Various	-	0.737	Apr 2023	1.756	Nov 2023	-		-		-	0.000	2.493	-
Other Support	Various	Various : Various	-	-		0.050	Jan 2024	-		-		-	0.000	0.050	-
Subtotal			-	0.737		1.806		-		-		-	0.000	2.543	N/A

	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		-	46.618	49.445	-	-	-	96.063	N/A

Remarks
BOOM-GSCCE \$23M fully funded in FY23 will support FY24 efforts. BOOM-PCMS \$18M partially funded in FY23

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206433SF / <i>Wideband Global SATC OM (SPACE)</i>	Project (Number/Name) 657107 / <i>WGS Space Systems Resiliency Upgrade</i>

	FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
WGS-11 & 12 Beam Planning Development																												
Management/System Integration/Test																												
WGS-BOOM-GSCCE																												
Design / Development																												
I&T / Fielding																												
WGS-BOOM-PCMS																												
Design / Development																												
I&T / Fielding																												
WGS-BOOM-CNPS																												
Design / Development																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206433SF / <i>Wideband Global SATC OM (SPACE)</i>	Project (Number/Name) 657107 / <i>WGS Space Systems Resiliency Upgrade</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
WGS-11 & 12 Beam Planning Development				
Management/System Integration/Test	2	2023	4	2024
WGS-BOOM-GSCCE				
Design / Development	2	2023	2	2024
I&T / Fielding	2	2024	4	2024
WGS-BOOM-PCMS				
Design / Development	2	2023	2	2024
I&T / Fielding	2	2024	4	2024
WGS-BOOM-CNPS				
Design / Development	4	2023	4	2024

Note

Funding ends in FY 2024. GSCCE and PCMS schedule events continue efforts begun in FY 2023, included in WGS-11+Beam Planning Development funding/schedule line items in FY 2023.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206440SF / <i>Next-Gen OPIR -- Ground</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	582.529	661.367	558.013	0.000	558.013	371.990	287.207	297.569	303.438	0.000	3,062.113
657106: <i>Next-Gen OPIR-Ground</i>	-	582.529	661.367	558.013	0.000	558.013	371.990	287.207	297.569	303.438	0.000	3,062.113
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

Next-Generation Overhead Persistent Infrared (Next-Gen OPIR) Ground (Project 657106): Next-Gen OPIR Ground, also known as Future Operationally Resilient Ground Evolution (FORGE), consists of a modern Command and Control (C2) capability, modernization of Mission Data Processing (MDP) to implement an open framework and develop mission applications, required development and upgrades to Relay Ground Stations (RGS), and Endurable FORGE (E-FORGE), to provide a modern survivable and endurable architecture to meet USSF current and future space domain needs. FORGE will provide the flexibility and scalability to integrate new satellites, sensors and capabilities more rapidly and efficiently in order to meet evolving threats and warfighter needs. The Next-Gen OPIR Ground efforts enable cyber enhancements for both space and ground systems. FORGE C2 will introduce infrastructure and common platform services, mission unique software such as Telemetry, Tracking, and Commanding (TT&C), and mission management to support initial Next-Gen OPIR Space satellite launches without driving risk into the FORGE development schedule. The program has established a risk reduction ground capability, Next-Gen OPIR Interim Operations (NIO), based on a limited Space Based Infrared System (SBIRS) Block 20 solution. E-FORGE will investigate a survivable antenna system and mission data processing system to enable Survivable and Endurable (S/E) ground mission operations for the Next-Gen OPIR Missile Warning (MW) mission.

The total cost of the FORGE Rapid Prototype Middle Tier of Acquisition (MTA) effort is 2,422.6 million. The RGS development and fielding is not contained in the MTA effort, as it consists of stand-alone Acquisition Category (ACAT) III efforts. The FORGE Rapid Prototype MTA is fully funded across the Future Years Defense Program.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Next-Gen OPIR Ground system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 1206392SF and 1206398SF.

This program is in Budget Activity 5, System Development and Demonstration (SDD) because it has passed Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full rate production.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 1206440SF / Next-Gen OPIR -- Ground
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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	582.529	661.367	557.034	0.000	557.034
Current President's Budget	582.529	661.367	558.013	0.000	558.013
Total Adjustments	0.000	0.000	0.979	0.000	0.979
• 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	0.979	0.000	0.979

Change Summary Explanation

FY 2025: +0.979M; Inflation adjustment

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
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Title: FORGE Command and Control (FC2)	59.945	109.580	71.792
Description: FC2 is a Government-owned Missile Warning ground architecture that provides infrastructure, Mission Unique Software (MUS) and sensor/spacecraft specific C2 capabilities that use common messaging standards to transition C2 of the legacy Space-Based InfraRed System (SBIRS) constellation, including MUS efforts developed under the Geosynchronous Non-Integrated Tactical Warning and Attack Assessment Ops Migration to EGS (GNOME) prototype, and integration of Next-Gen OPIR Geosynchronous Earth Orbit (GEO) (NGG) and Next-Gen OPIR Polar (NGP) MUS to FORGE in order to deliver an integrated Missile Warning C2 ground system. Includes Mission Management, Telemetry Command and Control, Ground Resource Management, and user interface software development and the integration of the Flight Dynamics software.			
FY 2024 Plans: GNOME: Complete development and integration of C2 Mission Management MUS and core application for a GEO space vehicle. FC2: Begin the prototype demonstration competition to develop and integrate the Mission Management, Ground Resource Control Management, and user interface software to support NGP. This will serve as the foundation for the C2 system to support NGP, NGG, and SBIRS.			
FY 2025 Plans: Complete the prototype demonstration to integrate the Mission Management, Ground Resource Control Management, and user interface software to support NGP. Award the final FC2 Phase 2 contract to continue software development of C2 to support NGP			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>		R-1 Program Element (Number/Name) PE 1206440SF / <i>Next-Gen OPIR -- Ground</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>launch, which will serve as the baseline foundation to transition SBIRS and NGG to FC2. Begin integration of the NGP MUS with the FC2 system.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to the completion of GNOME and integration activities.</p>				
<p>Title: Mission Data Processing (MDP)</p> <p>Description: The FORGE MDP is a replacement for the existing legacy SBIRS Ground mission processing applications which have cyber security and scalability limitations. MDP is creating a cyber-resilient, flexible, and scalable open framework capable of meeting current and future threats. MDP will plan OPIR and other mission data resource utilization to meet warfighter requirements. MDP provides the ability to ingest and publish varying levels of processed data for enhanced processing, perform efficient and systematic upgrades, and orchestrate real-time wideband processing for ITW/AA and non-ITW/AA mission areas. The MDP system provides modular mission applications to meet the future challenges of Missile Warning (MW), Missile Defense (MD), Battlespace Awareness (BA), and Technical Intelligence (TI). MDP is critical to making cyber-secure, effective use of the increased amounts of data that will be collected by Next-Gen OPIR.</p> <p>FY 2024 Plans: Deliver follow-on applications for SBIRS non-ITW/AA data processing. Continue development of follow-on MDP Applications Framework (MDPAF) effort. Continue follow-on development of MDP Applications Provider (MDPAP) effort for ITW/AA data processing. Continue follow-on development for Sensor Specific Processing (SSP) to support migration of all SBIRS Highly Elliptical Orbit (HEO) and GEO assets to FORGE framework. Integrate entire mission data processing thrust area (MDPAF, MDPAP, and SSP) and begin sub-system level testing using operational data. FY 2024 funding will allow the program to implement system resiliency, cyber security and be responsive to evolving threats necessary to operate in the contested space domain. Activities include, but are not limited to, program office support, studies, technical analysis, experimentation, and prototyping.</p> <p>FY 2025 Plans: Complete development of the follow-on MDPAF effort. Continue follow-on development and begin integration of MDPAP applications onto the FORGE framework for SBIRS ITW/AA data processing. Continue follow-on development for SSP to support migration of all SBIRS HEO and GEO assets to FORGE framework. Begin final system level integration and testing of mission data processing thrust area (MDPAF, MDPAP, and SSP) for SBIRS transition to operations on FORGE. Begin the DevSecOps pipeline to be responsive to evolving threats. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement:</p>		237.654	269.141	304.585

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>		R-1 Program Element (Number/Name) PE 1206440SF / <i>Next-Gen OPIR -- Ground</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
FY 2025 increased due to system level integration of MDPAF, MDPAP, and SSP for the transition of SBIRS to FORGE operations.				
<p>Title: Next-Gen Transition</p> <p>Description: Next-Gen transition is the development to enable use of FORGE for mission processing and C2 for future OPIR space systems. Included in this effort is the development of Next Gen Interim Ops (NIO) to ensure the most critical ground processing is ready in time for the first Next-Gen OPIR GEO satellite launch as required by JROCM 130-17. NIO will create mono tracks and publish those mono tracks to the existing SBIRS Block 20 ground system for fusion and dissemination to the warfighter.</p> <p>FY 2024 Plans: Complete Space to Ground capability testing with NGG-1. Complete development of the interim system, and final integration and testing events prior to NGG-1 launch. Continue development and integration of the mission unique software needed for C2 for NGG and NGP. Continue integration of multiple mission data processing applications into the framework to support NGG. Begin development needed to support NGG-2 and NGP-1 launch.</p> <p>FY 2025 Plans: Continue development and integration of the mission unique software needed for C2 for NGG and NGP. Continue integration of multiple mission data processing applications into the framework to support NGG and NGP.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to completion of NIO integration and test activities in prep for NGG-1 launch.</p>		212.119	134.854	110.153
<p>Title: Relay Ground Station - Asia (RGS-A)</p> <p>Description: OPIR data collected in space must be relayed to ground entry points and routed to provide warfighters with timely information. The legacy SBIRS ground architecture requires RGS upgrades and new RGSs to receive OPIR data from legacy and future Next-Gen OPIR assets. This effort will provide data to the Mission Control Station (MCS) for processing and dissemination to warfighters and National Command Authorities. The RGS modernization effort will include the ability to operate antennas and process data. This activity is for the Asia ground station portion of the FORGE - RGS architecture and includes 6 antennas. It is an ACAT III program.</p> <p>FY 2024 Plans: Purchase final mission equipment and complete site construction activities. Begin final system installation and checkout.</p> <p>FY 2025 Plans: Complete final system installation and checkout.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement:</p>		72.811	67.792	43.571

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>		R-1 Program Element (Number/Name) PE 1206440SF / <i>Next-Gen OPIR -- Ground</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
FY 2025 decreased due to ramp down in development and completion of site integration.				
<p>Title: Relay Ground Stations (RGSs)</p> <p>Description: OPIR data collected in space must be relayed to ground entry points and routed to provide warfighters with timely information. The legacy SBIRS ground architecture requires RGS upgrades and new RGSs to receive OPIR data from legacy and future Next-Gen OPIR assets. This effort expands two additional RGSs that will use common hardware capable of supporting all Next Gen-OPIR space assets. This effort will provide data to the MCS for processing and dissemination to warfighters and National Command Authorities. The RGS modernization effort will include the ability to operate antennas, process data, and support older DSP assets. This activity is for RGS's not included in the RGS-A portion of the FORGE - RGS architecture.</p> <p>FY 2024 Plans: Award second site, RGS-S, contract to design and purchase ITW/AA-class antenna and associated hardware for the Next-Gen Constellation. Complete site approval process and preliminary design. Release Request for Proposal (RFP) for third RGS site RGS-UK, in Europe, and execute site preparations.</p> <p>FY 2025 Plans: Continue second site, RGS-S, development and integration activities. Award third RGS site RGS UK, which includes purchasing ITW/AA-class antenna and associated hardware for the Next-Gen Constellation. Execute site preparations.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to completion of long lead item purchases for RGS-S.</p>		0.000	45.000	27.912
<p>Title: E-FORGE</p> <p>Description: E-FORGE was a new start activity in FY24. As an FY24 new start, the operating concept is still being finalized. Future allocation of resources to this PE will be used to assist in the employment of the operating concept, once approved. Endurable FORGE (E-FORGE) is envisioned as a possible solution to replace the interim SBIRS Survivable Endurable Evolution (S2E2) system and provides continuous survivable and endurable non-imaging infrared for MW reporting across all phases of military operations to ITW/AA, Chairman, Joint Chiefs of Staff (CJCS) and Nuclear Command and Control System architectures. E-FORGE, as envisioned, enables the integration of SBIRS GEO 1-6 and the Next-Gen OPIR MW mission data through a survivable antenna system and a modernized data processing platform that adopts the FORGE MDP open framework and the FORGE C2 (FC2) baseline solution, and an integrated data architecture for missile warning. Additionally, E-FORGE may integrate nuclear detonation detection (NUDET) data from GPS sensors and utilize protected MILSATCOM for strategic reporting.</p> <p>FY 2024 Plans: E-FORGE began initial studies/prototyping needed for the development of a survivable antenna system and shelters. Additionally, E-FORGE began development of a data processing platform to include mission unique software that will support the survivable</p>		0.000	35.000	0.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206440SF / <i>Next-Gen OPIR -- Ground</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>endurable architecture. Additional activities include, but are not limited to, intra and inter program office technical support for requirements analysis and technical assistance. E-FORGE was a new start activity in FY24. As an FY24 new start, the operating concept is still being finalized. Future allocation of resources to this PE will be used to assist in the employment of the operating concept, once approved.</p> <p>FY 2025 Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased; awaiting USSF Force Design analysis.</p>			
Accomplishments/Planned Programs Subtotals	582.529	661.367	558.013

D. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

E. Acquisition Strategy

The Next-Gen OPIR Ground program is executing an acquisition strategy using Middle Tier of Acquisition (MTA) authority for Rapid Prototyping approved via Acquisition Decision Memorandum on 5 Dec 19. The program will transition to the software acquisition pathway at the end of the MTA.

To support this acquisition strategy, the program will follow an agile approach to develop capabilities and a robust DevSecOps (Development/Security/Operations) solution to deliver the capabilities. The FORGE program is pursuing a rapid prototyping approach founded primarily on software and infrastructure reuse, partnerships with other programs, limited scope, use of existing contracts where necessary, and maximizing competition where possible. For the MDP thrust, the FORGE program is using competitive use Other Transaction (OT) authorities to develop the framework and the applications. For the FC2 thrust, the FORGE team is using competitive use OT authorities to develop the Mission Management, Telemetry Command and Control, Ground Resource Management, and user interface software, while the mission unique software will be provided by the space vehicle contractors. For the Next-Gen Transition effort, the program is using the Next-Gen GEO and Next-Gen Polar contract with the space vehicle prime contractor to perform the work needed to develop the ground capabilities. The program is executing the MDP, FC2, and NIO thrusts within the scope of its Middle Tier of Acquisition authorities. The program is executing the RGS thrust using traditional acquisition authorities. RGS-A was designated an ACAT III by the MDA.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206440SF / Next-Gen OPIR -- Ground	Project (Number/Name) 657106 / Next-Gen OPIR-Ground
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
FC2	Various	Various : TBD	-	59.945	Jun 2023	109.580	Apr 2024	71.792	Dec 2024	-		71.792	Continuing	Continuing	-
MDP	Various	Various : TBD	-	161.281	Nov 2022	215.469	Nov 2023	236.764	Nov 2024	-		236.764	Continuing	Continuing	-
Next-Gen Transition	Various	Various : TBD	-	212.119	Nov 2022	134.854	Nov 2023	110.153	Nov 2024	-		110.153	Continuing	Continuing	-
RGS-A	Various	NWIC and Northrop Grumman : Boulder, CO	-	72.811	Nov 2022	67.792	Nov 2023	43.571	Nov 2024	-		43.571	Continuing	Continuing	-
RGSs	TBD	Various : TBD	-	-		45.000	May 2024	27.912	Nov 2024	-		27.912	Continuing	Continuing	-
E-FORGE	Various	Various : TBD	-	-		35.000	Jan 2024	-		-		-	Continuing	Continuing	-
SE&I	TBD	TBD : TBD	-	23.208	Dec 2022	14.580	Dec 2023	30.537	Dec 2024	-		30.537	Continuing	Continuing	-
Technical Mission Analysis	RO	Aerospace Corporation : El Segundo, CA	-	6.958	Jan 2023	3.381	Jan 2024	7.005	Jan 2025	-		7.005	Continuing	Continuing	-
Subtotal			-	536.322		625.656		527.734		-		527.734	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
FFRDC	RO	Aerospace Corporation : El Segundo, CA	-	8.967	Jan 2023	4.036	Jan 2024	5.822	Jan 2025	-		5.822	Continuing	Continuing	-
A&AS	Various	Various : TBD	-	36.890	Feb 2023	31.400	Nov 2023	24.081	Nov 2024	-		24.081	Continuing	Continuing	-
Other Support	Various	Various : TBD	-	0.350	Nov 2022	0.275	Nov 2023	0.376	Nov 2024	-		0.376	Continuing	Continuing	-
Subtotal			-	46.207		35.711		30.279		-		30.279	Continuing	Continuing	N/A

			Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	582.529	661.367	558.013	-	558.013	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206440SF / <i>Next-Gen OPIR -- Ground</i>	Project (Number/Name) 657106 / <i>Next-Gen OPIR-Ground</i>
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FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

FC2	
GNOME	
Phase 1 - Prototype Competition	
Phase 2 - NGP Follow-on	
NGG	
SBIRS	
MDP	
Follow-On Prototype Framework Development	
Follow-On Prototype Applications Provider Development	
Sensor Specific Processing	
Next-Gen Transition	
Next-Gen GEO Development	
Next-Gen Polar Development	
RGS-A	
RGS-A Development	
RGSs	
RGSs Development	
E-FORGE	
E-FORGE	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206440SF / <i>Next-Gen OPIR -- Ground</i>	Project (Number/Name) 657106 / <i>Next-Gen OPIR-Ground</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
FC2				
GNOME	1	2023	1	2024
Phase 1 - Prototype Competition	4	2023	2	2025
Phase 2 - NGP Follow-on	3	2025	4	2029
NGG	1	2026	4	2029
SBIRS	1	2027	4	2029
MDP				
Follow-On Prototype Framework Development	1	2023	4	2029
Follow-On Prototype Applications Provider Development	1	2023	4	2029
Sensor Specific Processing	1	2023	4	2025
Next-Gen Transition				
Next-Gen GEO Development	1	2023	4	2028
Next-Gen Polar Development	1	2023	4	2029
RGS-A				
RGS-A Development	1	2023	4	2025
RGSs				
RGSs Development	2	2024	2	2029
E-FORGE				
E-FORGE	2	2024	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206442SF / <i>Next Generation OPIR</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	251.601	222.178	202.951	0.000	202.951	204.238	203.707	214.191	217.471	Continuing	Continuing
657009: <i>Space Mod Initiative</i>	-	196.884	191.144	170.717	0.000	170.717	173.509	172.343	181.696	184.335	Continuing	Continuing
657123: <i>Integration</i>	-	54.717	31.034	32.234	0.000	32.234	30.729	31.364	32.495	33.136	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Overhead Persistent Infrared (OPIR) program succeeds the current Space Based Infrared System (SBIRS) and will provide improved missile warning, missile defense, battlespace awareness, and technical intelligence collection capabilities that are more survivable against emerging adversary threats. The program will deliver satellites in a diverse set of orbits to meet mission coverage needs; a modular, extensible, and cyber-hardened ground system to operate and process mission data downlinked from on-orbit assets; an on-ramp to demonstrate novel infrared technologies; and an integration effort will identify, plan, manage and execute integration activities at the enterprise level. Due to funding transfers to segregate Next-Gen OPIR into other Program Elements, PE 1206442SF is now comprised of two projects: 1. Next-Gen OPIR Space Modernization Initiative (SMI) and 2. Integration.

1. SMI (Project 657009/Program Element 1206442SF): To better enable response to emerging global missile threats, SMI advances capabilities and reduces risk through three major thrust areas: Demonstrations/Prototypes, Technology Maturation, and Data Exploitation. Demonstrations mature technologies by delivering ground and on-orbit prototypes. They advance OPIR capabilities for missile warning and tracking, ensuring a low risk, smooth transition of advanced technology to future operational systems. Each year, Space System Command (SSC) conducts a review of all technical development needs for future OPIR systems across the stakeholder community to include the Missile Defense Agency, Space Development Agency, Air Force Research Lab, and mission partners to prioritize technical investment and develop transition roadmaps. The investments described align to the OPIR technology needs published in the Portfolio Decision Support Tool (PDST). Technology Maturation focuses development on advanced infrared sensing optics and electronics, resiliency hardware and software, and on-board processing algorithms and on-board computers. Data Exploitation provides return-on-investment aimed at ingest and fusion of current and future multiple sensor program data to enhance missile warning, missile defense, battlespace awareness and technical intelligence mission capabilities. This includes the processing and exploitation of the Wide Field of View (WFOV) Geosynchronous Earth Orbit (GEO) wideband sensor data focused on dimmer threat targets, as well as future program data including Next-Gen GEO, Missile Track Custody (MTC), Medium-Earth Orbit (MEO), Resilient Missile Warning/Missile Tracking (MW/MT), and others. Data Exploitation includes maintaining the Tool, Applications, and Processing (TAP) Lab facility where enhanced software applications and algorithms for detection, tracking and visualization are developed and delivered in support of the Space Operations Command, Delta 4, 11th Space Warning Center and Air Combat Command (ACC)/26th Intelligence Squadron operators within the OPIR Battlespace Awareness Center (OBAC) at Buckley Space Force Base (SFB). The TAP Lab facility is also host to current SBIRS program Contract Logistics Support (CLS) activities, Future Operationally Resilient Ground Evolution (FORGE) mission data processing development and testing, and is expected to host Next-Generation Interim Control Center (NICC)-Next-Gen Interim Operations (NIO) Command and Control (C2) for GEO and potentially MTC Mission Data Processing (MDP) and C2. Data Exploitation also supports other mission areas to include Civil Support such as wildland fire tracking solutions. SMI supports Next-Gen OPIR by maturing new technologies to enable detection of new and challenging missile threats. SMI funds engineering activities to reduce both production and future system costs through manufacturing and producibility enhancements, and technology insertion. SMI includes risk reduction for Program of Record (PoR) to deliver capabilities on threat-relevant timelines to include FORGE, Next-Gen GEO and Polar, and Resilient MW/MT MEO.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206442SF / <i>Next Generation OPIR</i>
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2. Integration (Project 657123/Program Element 1206442SF): The Next-Gen OPIR Integration project includes efforts associated with the Government's primary role in, and tasks necessary to accomplish, the critical lead system integration function between the OPIR enterprise segments (Next-Gen GEO, Next-Gen Polar, Next-Gen Ground, and the Resilient MW/MT MEO/Low Earth Orbit (LEO) architecture). This includes Enterprise Systems Engineering and Integration (SE&I) activities, Modeling and Simulation activities, and Digital Engineering activities, to include Model Based System Engineering (MBSE). The focus of the Integration project is on system-level integration activities, between the Next-Gen OPIR segments, such as Space to Ground. This differs from integration within the individual program segments, which refers to subsystem-level integration between subsystems such as a spacecraft bus to the mission payload. The Government Integrator directs the Next-Gen OPIR current enterprise architecture and system definition, controls and validates interfaces, ensures compatibility of Next-Gen systems, and develops/manages plans for execution and fielding of the Next-Gen OPIR Enterprise. Further, the Integrator, through various Federally Funded Research and Development Centers (FFRDCs), government partners, and contractors, executes unique MBSE and integration requirements of each segment by providing modeling, simulation, and technical analyses of Government-directed enterprise level trades among the Next-Gen OPIR segments. These trades lead to definition, management, maintenance, and evolution of the Next-Gen OPIR Enterprise requirements and interface technical documents to ensure the integrity of the enterprise technical baseline.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Next-Gen OPIR weapon system capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 1206392SF and 1206389SF.

This program is in Budget Activity 5, System Development and Demonstration (SDD) because the majority of Projects under PE 1206442SF have been declared Section 804 Rapid Prototype efforts conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full rate production.

B. Program Change Summary (\$ in Millions)	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025 Base</u>	<u>FY 2025 OCO</u>	<u>FY 2025 Total</u>
Previous President's Budget	226.601	222.178	227.501	0.000	227.501
Current President's Budget	251.601	222.178	202.951	0.000	202.951
Total Adjustments	25.000	0.000	-24.550	0.000	-24.550
• 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	25.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	-24.550	0.000	-24.550

Change Summary Explanation

FY 2023: \$25.000M: ATR for Tactical Surveillance Reconnaissance & Tracking Commercial Pilot

FY 2025: -\$24.957M; Higher Priority USSF Investments

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 5					R-1 Program Element (Number/Name) PE 1206442SF / <i>Next Generation OPIR</i>				Project (Number/Name) 657009 / <i>Space Mod Initiative</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
657009: <i>Space Mod Initiative</i>	-	196.884	191.144	170.717	0.000	170.717	173.509	172.343	181.696	184.335	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Next-Gen OPIR Space Modernization Initiative (SMI) (Project 657009): To better enable response to emerging global missile threats, SMI advances critical capabilities and reduces risk through three major thrust areas: Demonstrations/Prototypes, Technology Maturation, and Data Exploitation. Demonstrations rapidly prototype new game-changing technologies for the broader mission warning enterprise by delivering ground and on-orbit prototypes. Demonstrations advance OPIR capabilities for missile warning and tracking ensuring a low risk, smooth transition of advanced technology to future operational systems. Technology Maturation focuses investments on high pay-off critical components to reduce production risks and development costs. Technology Maturation focuses development on advanced IR sensing optics and electronics, resiliency hardware and software, and on-board processing algorithms and on-board computers. Data Exploitation provides return-on-investment aimed at ingest and fusion of current and future multiple sensor program data to enhance Missile Warning (MW), Missile Defense (MD), Battlespace Awareness (BA) and Technical Intelligence (TI) mission capabilities. This includes the processing and exploitation of the Wide Field of View (WFOV) Geosynchronous Earth Orbit (GEO) wideband sensor data focused on dimmer threat targets, as well as future programs data including Next-Gen GEO and Polar, Missile Track Custody (MTC), Medium-Earth Orbit (MEO), Resilient Missile Warning/Missile Tracking (MW/MT), and others. Data Exploitation includes maintaining the Tool, Applications, and Processing (TAP) Lab facility where enhanced software applications and algorithms for detection, tracking and visualization are developed and delivered in support of the Space Operations Command, Delta 4, 11th Space Warning Center and Air Combat Command (ACC)/26th Intelligence Squadron operators within the Overhead Persistent Infrared Battlespace Awareness Center (OBAC) at Buckley Space Force Base (SFB). Data Exploitation also supports other mission areas to include Civil Support such as wildland fire tracking solutions. Data Exploitation also funds facilities and integration to support initial prototype operations until a transition to a space force operational unit is feasible. SMI supports Next-Gen OPIR by maturing new technologies to enable detection of new and challenging missile threats. SMI funds engineering activities to reduce both production and future system costs through manufacturing and producibility enhancements, and technology insertion. SMI includes studies and risk reduction activities to evolve the current Program of Record (PoR) constellation and/or simultaneously mature breakthrough technologies to create a leap in capability for follow-on systems to include FORGE, Next-Gen GEO and Polar, and Resilient MW/MT MEO.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Demonstrations/Prototypes	100.093	32.295	28.643
Description: Demonstrations and prototypes provide time-critical OPIR technologies, missions, and performance with ground and on-orbit prototypes. They enable transition of improved capabilities to full scale architectures and inform critical decisions for future fielding as well as support maturation of Mission Data Processing (MDP) algorithms for tactical and strategic applications by providing additional sensors and algorithms to advance detection and tracking.			
The SMI effort is critical to competing, maturing, designing, testing, and validating a system capable of tracking emerging missile threats outlined in the Missile Warning Missile Defense Capability Development Document (CDD).			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206442SF / <i>Next Generation OPIR</i>	Project (Number/Name) 657009 / <i>Space Mod Initiative</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
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<p>FY 2024 Plans: WFOV Program will transition to Data Exploitation in FY 2024.</p> <p>In the execution of the MEO/Low Earth Orbit (LEO) pivot, Space Systems Command (SSC) was designated as the lead end-to-end systems integrator and chartered to contribute to establishing a combined program office with the Space Development Agency (SDA) and Missile Defense Agency (MDA). As the SSC MEO and SDA LEO programs deploy capabilities in spiral increments, a centralized Digital Engineering Environment is necessary to capture MBSE requirements management and system level performance in support of multiple programs. In FY 2024, the OPIR Digital Engineering Demo will capture performance across sensors in development, current program of record sensors, and future government reference sensors to feed the requirements baseline for future OPIR spirals. This digital engineering effort will build upon the force design for a high-fidelity Government Reference MBSE Model (GRMM) that performs full system requirements traceability and detailed performance modeling of system in build. This effort will also demonstrate the use of cloud-based tools and models to share across SDA, MDA, Space Warfighting Analysis Center (SWAC), and others.</p> <p>There are two efforts that are on contract as of FY 2022. The first is the MEO specific transition to Secret Collateral Cloud using the Air Force's Cloud 1. The MEO program will leverage expertise to support a contract in FY 2024 to perform digital engineering and integration. The second is the OPIR Modeling and Simulation Center of Excellence established in FY 2022 to determine constellations and performance level trades using MEO, LEO, GEO, Highly Elliptical Orbit (HEO), and FORGE detailed models.</p> <p>To improve communication path diversity and delivery of low latency data without significantly ramping up ground entry points, development and test of Low Size Weight and Power (SWaP), high bandwidth, agile crosslinks for Medium Earth Orbit systems are necessary. Additionally, there is increasing demand for resiliency and communication path diversity of OPIR data driving the need for MEO to participate in enterprise networking of missile warning/tracking information. MEO Epoch 1 crosslinks were simplified in scope to preserve schedule and lower technical risks for initial performance/demonstration of utility. Epoch 2 must expand crosslink performance to pass and route tracking and warning data for correlation and fusion in multiple locations. As such, a demo is required prior to the start of Epoch 2 satellite development to enable a technology on-ramp. The Resilient MW/MT MEO Program Management Office (PMO) plans to combine funds with other mission partners to develop an enterprise capability.</p> <p>FY 2025 Plans: To ready MEO MW/MT mission architecture needs for FY 2026 Epoch 1 launches and FY 2025 Epoch 2 acquisition, continue investment in GRMM, secret collateral processing Impact Level 6 (IL6) space, the OPIR Modelling and Simulation Center, and invest in contractor secret intra-connectivity to the collateral space. Efforts enable both the infrastructure and licenses required for using classified tools as well as the expertise to run the tools and models and assess end to end system performance and operations.</p>			
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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206442SF / <i>Next Generation OPIR</i>	Project (Number/Name) 657009 / <i>Space Mod Initiative</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Continue the development and test of Low Size Weight and Power (SWaP), high bandwidth, agile crosslinks for MEO Epoch 2 engineering designs in FY 2026 in order to bolster resilience and communication path diversity of OPIR data and import of MEO data into enterprise networks. MEO Epoch 2 is expected to require expanded crosslink performance to pass and route tracking and warning data for correlation and fusion in multiple locations which will benefit from crosslinks testing in laboratory test beds to validate performance and increase the technology maturity of multiple vendor solutions.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to a reduction in MEO digital engineering and OPIR Center of Excellence activities.</p>			
<p>Title: Technology Maturation</p> <p>Description: Assess technology needs to support resiliency of PoR assets and future architectures that are responsive to the evolving threat environment. Perform trade and design studies to assess obsolescence, affordability, capability design modifications, and concept of operations (CONOPS) for the OPIR mission. Mature technologies and manufacturability to reduce cost, schedule, and technical risk for new component and subsystem designs that may be used in the future systems. Mature technologies including algorithms, Focal Plane Arrays (FPA), optical filters, on-board processors, auxiliary resiliency payloads, and other payload components for future missile warning satellites, and reconstitution capabilities. Develop modeling and simulation (M&S) capabilities, and engineering model prototypes for hardware/software integration and testing. These efforts will reduce risk and mature technologies applicable to future systems and architectures. Additionally, develop test beds to validate/verify requirements and ensure technical maturity for next-generation payload technologies as well as threat mitigation components and techniques.</p> <p>As a result of the SWAC AoA and Force Design, several key technologies areas were highlighted to execute the MEO/LEO pivot. A detailed manufacturability study was conducted in coordination with the SWAC during the AoA that recommend several critical technology maturation areas.</p> <p>FY 2024 Plans: Technology maturation will develop the next generation of FPAs that have higher dynamic range and increased resiliency. SSC will work with vendors to improve FPA manufacturing capability for larger format focal plane arrays to support the growing demands from sensor builders. FY 2024 funds will also support development of optimized intelligent tasking management. This effort will enhance the minimum-viable product for MEO Epoch 1 with scalability for future MEO growth to account for optimal tasking of area collection and real-time hypersonic containment. Furthermore, technical maturation will target investments in three-dimensional (3D) track correlation using artificial intelligence and machine learning for multi-orbit, higher volume sensor constellations. Additionally, funding will support filter technology and manufacturability to improve protection of sensors. Technology maturation will continue to invest in resilient processing algorithms and testbeds to support the hardware focused</p>	16.683	39.037	31.440

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206442SF / <i>Next Generation OPIR</i>	Project (Number/Name) 657009 / <i>Space Mod Initiative</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
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<p>investments. Finally, additional technical maturation is required to support the crosslink demonstration in support of Epoch 2. Advances in technology should enable backwards compatibility in Epoch 2.</p> <p>FY 2025 Plans: Technology maturation will continue the next generation FPA development for higher dynamic range and increased resiliency maturing them to approximately Technology Readiness Level 5 in FY 2025. Continue to work with vendors to improve FPA manufacturing capability for larger format focal plane arrays to support the critical needs necessary to deliver the proliferated MW/MT systems on threat relevant timelines. Continue development of optimized intelligent tasking management. This effort will enhance the MEO Epoch 1 solution by adding and comparing performance against artificial intelligence-based tasking. Furthermore, technical maturation will continue proving novel methodologies leveraging phenomenology unique to hypersonic weapons. Additionally, funding will continue to support filter technology and manufacturability to improve protection of sensors from ground and on-orbit threats. FY 2025 investments will ensure the MEO Epoch 2 systems will be developed on schedule due to the maturation of key system components.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to a reduction in resilient algorithm testbed and 3D track correlation activities.</p>			
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<p>Title: Data Exploitation</p> <p>Description: Data exploitation efforts will exploit existing and future OPIR, environmental weather, and ground radar data sources including Defense Support Program (DSP), SBIRS HEO, SBIRS GEO Scanner, SBIRS GEO Starer, WFOV demonstration (launched 01 Jul 2022), Geostationary Operational Environmental Satellites-R series (GOES-R) East/West, prototypes, and future program data sources. Exploitation efforts include RDT&E and integrating multiple sensor data through collection, processing, fusion, data dissemination, application and algorithm development and testing, network connectivity, and sensor performance assessments. SBIRS, WFOV and other space and ground-based sensors provide rich data sets for exploitation and fusion with the objective of filling sensor capability gaps in support of the new dim target threats. The SMI Data Exploitation TAP Lab provides researchers and developers access to raw and processed data and advanced DevSecOps (Development/Security/Operations) tools to develop applications and algorithms for delivery to the Buckley SFB OBAC in support of MW, MD, BA and TI mission areas. SMI data exploitation efforts are complementary to, and enhance, the exploitation capabilities delivered by the PoR and prototypes while pathfinding for future sensor PoRs. While performing data exploitation, the TAP Lab will serve as the primary software factory DevSecOps pipeline and subject matter experts to on-board new sensors into known operational fusion and correlation capabilities. SSC, SDA, and MDA will collaborate for future ground reference architecture for MEO and LEO that relies on sensors delivering formatted data to the Real-Time Transfer Service (RTS). Once published to the RTS, operational warning and defense software could then fuse and correlate data across sensors from all orbits to generate a 3D track. The 3D track will allow warning and defense operational systems to distribute and message appropriately. The TAP Lab will work with both the MEO MTC program office and SDA for early integration and testing using the FORGE framework. The TAP Lab is a critical piece</p>	80.108	119.812	110.634
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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206442SF / <i>Next Generation OPIR</i>	Project (Number/Name) 657009 / <i>Space Mod Initiative</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>in the future sensor proliferation as it provides a test and demo suite of resources to streamline sensor acceptance into certified warning and defense operations.</p> <p>Data exploitation efforts also evaluate tools for C2, mission management, and MDP to reduce risk to current and future programs. Data exploitation has also focused on pathfinding and evolving PoR ground systems to an open architecture framework. By incorporating C2, the TAP Lab offers the capability for launch and early orbit support as well operations and integration of future government owned, contractor operated OPIR prototypes.</p> <p>SMI ground system development activities seek to demonstrate the performance of an evolved ground system architecture capable of supporting multiple satellites, payloads, and missions through management and data processing. These efforts seek to lower operating costs with enhanced net-centric and service-oriented features with a new flexible expansion capability. Data exploitation efforts also support demonstration and prototype architecture planning and experimentation to include WFOV and other future sensor programs.</p> <p><i>FY 2024 Plans:</i> Continue to innovate wildland fire tracking capabilities and incorporate applications into national fire tracking solutions. Deliver High Altitude Dim Event Stalker (HADES) suite of applications and algorithms that include target detection, track fusion and common operating picture visualization along with near-real-time recording capabilities to enhance ability to report on PACOM Joint Emergent Operational Need/Joint Urgent Operational Need (JEON/JUON) threats. This includes ingesting and tuning the HADES suite of applications to exploit the recently launched WFOV sensor data. Develop CONOPS for the WFOV 6-degree starer sensor over USINDOPACOM and participate in demonstrations and exercises with the community to ensure timely data delivery. Refine and improve WFOV calibration, experimentation, exploitation and data delivery as user requests increase and more stakeholders find utility with the new sensor data. WFOV data will be used to path find new algorithm processing chains at the TAP Lab, transition to the OBAC, and deliver new products to the warfighter community.</p> <p>Develop capabilities for HADES to ingest ground radar data as well as other available platform data available on RTS to fuse, evolve, and enhance the ability to detect and track missile, air, and other emerging threats. Expand exploitation lab sources and OBAC applications to support development of experimental operations. Develop prototype processes for managing an open framework architecture. Develop applications for the OBAC that transition to the FORGE. Support deployment, testing, and integration of the FORGE framework and all updates. Enhance mission resiliency and data exploitation of SBIRS and other OPIR data using BAAs and OTAs. Continue to collaborate with the IC and MDA to enhance JOG study initiatives. Continue to develop and demonstrate the performance of a Government owned open and extensible evolved ground system architecture to support multiple satellites, payloads, and missions, as required. Evolve data processing for infrared payload applications with enhanced net-centric and service-oriented features.</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206442SF / <i>Next Generation OPIR</i>	Project (Number/Name) 657009 / <i>Space Mod Initiative</i>
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B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
<p>In preparation for MEO and LEO Tracking Tranche 1 sensors, the TAP Lab will demonstrate a pipeline to on-board sensors into operations using a 3D track correlation and fusion ground capability, which will expedite transition of new sensors into operational systems. Additionally, it will create test, calibration, and tuning routines necessary for MEO and LEO performance validation to ensure downstream warning and defense operations can ingest sensor data. Collaborating with the FORGE MDP Application Provider, the TAP Lab will develop and incorporate 3D tracks for observers in hybrid constellations into a M&S tool to allow enterprise-level tracking performance prediction against multiple scenarios based on data and analysis from multiple flight demo systems.</p> <p>Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to, program office support, studies, technical analysis, modeling, simulation, experimentation, prototyping.</p> <p>FY 2025 Plans: Transition matured High Altitude Dim Event Stalker (HADES) suite of applications and algorithms to FORGE framework. This includes ability to ingest and exploit the WFOV data as well as legacy SBIRS narrowband/wideband data and track not JEON/JUON threats but other targets within the United States Indo-Pacific Command (USIDNOPACOM) Area of Responsibility (AOR). This activity will support FORGE delivering incremental capabilities to the framework in FY 2025 beyond their Mission Data Processing Application Provider (MDPAP) non-degradation requirements. Re-focus on the 5-10 year out problems associated with proliferated constellations producing large volumes of data and target detections that could potentially overwhelm ground communications, networks, infrastructure common operation picture, and operators. Continue to implement potential solutions such as Artificial Intelligence and Machine Learning (AI/ML) to these problems. Continue to innovate wildland fire tracking capabilities and incorporate applications into national fire tracking solutions.</p> <p>Continue capability enhancements of HADES and to ingest additional sensor sources to include not only ground radar but intelligence data as well as other available platform data available on RTS to fuse, evolve, and enhance the ability to detect and track missile, air, and other emerging threats. Expand exploitation lab sources and OBAC applications to support development of experimental operations. Enhance prototype processes for managing an open framework architecture. Develop applications for the OBAC that transition to the FORGE. Support application deployment, testing, and integration into the FORGE MDPAP framework and all updates. Enhance mission resiliency and data exploitation of SBIRS and other OPIR data using Broad Agency Announcements (BAAs) and Other Transaction Agreements (OTAs). Continue to collaborate with the Intelligence Community (IC) and MDA to enhance Joint OPIR Ground (JOG) study initiatives. Continue to develop and demonstrate the performance of a Government owned open and extensible evolved ground system architecture to support multiple satellites, payloads, and missions, as required. Evolve data processing for infrared payload applications with enhanced net-centric and service-oriented features.</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206442SF / <i>Next Generation OPIR</i>	Project (Number/Name) 657009 / <i>Space Mod Initiative</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>For MEO and LEO Tracking Tranche 1 sensors, the TAP Lab will continue to demonstrate a pipeline to on-board sensors into operations using a 3D track correlation and fusion ground capability, which will expedite transition of new sensors into operational systems in FY 2025 and beyond. Additionally, it will continue test, calibration, and tuning routines necessary for MEO and LEO performance validation to ensure downstream warning and defense operations can ingest sensor data. Continue collaboration with the FORGE MDPAP. The TAP Lab will improve 3D tracks for observers in hybrid constellations into a M&S tool to allow enterprise-level tracking performance prediction against multiple scenarios based on data and analysis from multiple flight demo systems.</p> <p>Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to a reduction in OBAC application development.</p>			
Accomplishments/Planned Programs Subtotals	196.884	191.144	170.717

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
• SPAF 01 MSSBIR: <i>SBIR High (Space)</i>	0.000	-	0.000	-	0.000	0.000	-	-	-	0.000	0.000

Remarks

D. Acquisition Strategy

The program office will use a variety of acquisition approaches to execute various concept studies, technology maturation efforts, testbed/prototype demonstrations, and data exploitation initiatives and projects. The program office will collaborate with appropriate contracting agencies to support each individual effort. Data exploitation efforts in the laboratory and the OBAC will leverage existing external contracts, as well as new internal competitive contracts. Activities, such as SBIRS obsolescence and affordability enhancements to the existing satellite design, will leverage existing Program of Record contracts. Technology maturation and component prototyping and/or qualification could leverage existing contracts. BAAs and OTAs are planned in collaboration with AFRL and other government agencies. Where practical, other efforts are competed. A SSC BAA will be used to acquire and mature high priority technology items. Federally Funded Research and Development Center (FFRDC), University Affiliated Research Centers (UARCs), and Systems Engineering and Technical Assistance (SETA) contractors will also be used to conduct and support studies. New technology, replacement components, and system designs will be acquired with government data rights to the maximum extent, allowing incorporation into future OPIR satellite production or system development. Contracting partnerships with other agencies will also be used to study, develop, demonstrate, and prove emerging capabilities. To accelerate contracting actions and program execution, the Space Enterprise Consortium (SpEC) will be utilized to execute OTAs to conduct data exploitation improvements at the OBAC and TAP Lab. A local SSC contract is being utilized for services at the OBAC and TAP Lab.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206442SF / <i>Next Generation OPIR</i>	Project (Number/Name) 657009 / <i>Space Mod Initiative</i>
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Demonstrations/Prototypes (Demos)	Various	Various : Various	-	88.343	Dec 2022	-		-		-		-	Continuing	Continuing	-
Demos - MEO Digital Engineering	Various	Various : Various	-	-		7.830	Dec 2023	4.946	Dec 2024	-		4.946	Continuing	Continuing	-
Demos - OPIR Center of Excellence	Various	Various : Various	-	-		3.524	Dec 2023	2.226	Dec 2024	-		2.226	Continuing	Continuing	-
Demos - Low SWaP Crosslink	Various	Various : Various	-	-		14.529	Dec 2023	14.965	Dec 2024	-		14.965	Continuing	Continuing	-
Technology Maturation (Tech Mat)	Various	Various : Various	-	14.725	Jan 2023	-		-		-		-	Continuing	Continuing	-
Tech Mat - Resilient FPAs	MIPR	SAF/FMBIB : Washington, DC	-	-		14.400	Jan 2024	14.832	Jan 2025	-		14.832	Continuing	Continuing	-
Tech Mat - Intelligent Tasking	Various	Various : Various	-	-		3.848	Jan 2024	3.963	Jan 2025	-		3.963	Continuing	Continuing	-
Tech Mat - 3D Correlation/ Fusion	Various	Various : Various	-	-		3.848	Jan 2024	-		-		-	Continuing	Continuing	-
Tech Mat - Filters and Coating	MIPR	Various : Various	-	-		1.931	Jan 2024	1.989	Jan 2025	-		1.989	Continuing	Continuing	-
Tech Mat - Resilient Algorithms/Test Bed	MIPR	Various : Various	-	-		3.848	Jan 2024	-		-		-	Continuing	Continuing	-
Tech Mat - Crosslink Enabling Tech	Various	Various : Various	-	-		3.412	Jan 2024	3.514	Jan 2025	-		3.514	Continuing	Continuing	-
Data Exploitation (Data Ex)	Various	Various : Various	-	70.704	Jan 2023	74.851	Jan 2024	50.264	Jan 2025	-		50.264	Continuing	Continuing	-
Data Ex - TAP Lab and OBAC Support Services (TLOSS)	RO	Parsons : Pasadena, CA	-	-		18.000	Jan 2024	20.623	Jan 2025	-		20.623	Continuing	Continuing	-
Data Ex - TAP Lab - Other Activites	RO	AFRL : Albuquerque, NM	-	-		-		7.414	Jan 2025	-		7.414	Continuing	Continuing	-
Data Ex - Wide Field of View (WFOV) Activities	MIPR	Various : Various	-	-		19.040	Jan 2024	20.863	Jan 2025	-		20.863	Continuing	Continuing	-
Enterprise SE&I	MIPR	Booz Allen Hamilton : El Segundo, CA	-	6.633	Dec 2022	6.500	Dec 2023	6.776	Dec 2024	-		6.776	Continuing	Continuing	-

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206442SF / <i>Next Generation OPIR</i>	Project (Number/Name) 657009 / <i>Space Mod Initiative</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Demonstration/Prototypes - Track Custody Demo</i>				
Develop and Test	1	2023	4	2023
Mission Payload Critical Design Review	1	2023	1	2023
Mission Payload, Bus Build & Test	1	2023	4	2023
TCD Space Vehicle Critical Design Review	4	2023	4	2023
<i>Demonstration/Prototypes</i>				
Rapid Prototyping Studies and additional Design Development	1	2024	4	2029
Digital Engineering Models	1	2024	4	2029
Develop Low SWaP Crosslink	1	2024	1	2026
<i>Technology Maturation</i>				
Development High Dynamic Range (HDR) FPAs	1	2023	4	2028
Operational HDR (TRL 5-6)	1	2026	1	2026
Develop Manufacturable Filters	1	2024	1	2026
Resilient Algorithm Development & Test Bed	1	2023	4	2028
Intelligent Tasking	1	2024	1	2029
3D Correlation/Fusion	1	2024	1	2029
<i>Data Exploitation</i>				
Execute BAAs	1	2023	4	2023
SpEC OTAs	1	2023	4	2029
TAP Lab & OBAC Facilities and Infrastructure	1	2023	4	2029
WFOV Early On-Orbit Calibration, Experimentation and Exploitation	1	2023	4	2029
WFOV Taskings and Mission Planning	1	2023	4	2029
High Altitude Dim Event Stalker (HADES) MVP to OBAC	1	2023	4	2023

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206442SF / <i>Next Generation OPIR</i>	Project (Number/Name) 657009 / <i>Space Mod Initiative</i>
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Tune HADES to ingest WFOV calibrated wideband (Focused on Emerging Threats)	1	2023	1	2024
HADES IOC - Transition on FORGE MDPAP	2	2024	2	2024
HADES FOC - Transition on FORGE MDPAP	4	2024	4	2024
TAP Lab - Host/Support FORGE MDP Integration and Testing	1	2023	2	2026
TAP Lab - Host/Support Next-Gen Ground/Interim Operations Control Center (NICC) GEO C2	1	2023	4	2026
Host/Support Resilient MWMT MEO C2	1	2023	2	2027
Tune MDPAP applications/algorithms to ingest Ground Radar Data, Next-Gen OPIR, MTC MEO, SDA LEO Tranches, and future sensors	2	2023	4	2029

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 5					R-1 Program Element (Number/Name) PE 1206442SF / <i>Next Generation OPIR</i>				Project (Number/Name) 657123 / <i>Integration</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
657123: <i>Integration</i>	-	54.717	31.034	32.234	0.000	32.234	30.729	31.364	32.495	33.136	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Government works with the Enterprise System Engineering & Integration (SE&I) contractor as a team to define the Next-Gen OPIR enterprise architecture, control and validate interfaces, ensure compatibility of Next-Gen OPIR systems, and develop/manage plans for fielding the Next-Gen OPIR segments. Further, the Enterprise SE&I executes system-level integration requirements between segments such as Space to Ground. This differs from integration within each segment; integration within segments refers to subsystem-level integration between subsystems such as a spacecraft bus to the mission payload. The Government Integrator is responsible for defining the Next-Gen OPIR enterprise architecture, controls and validates interfaces, ensures compatibility of Next-Gen OPIR systems, and develops/manages plans for fielding the Next-Gen OPIR Enterprise. Further, the Integrator executes Model Based System Engineering (MBSE) through modeling, simulation, and technical analyses of Government-directed enterprise level trades among the Next-Gen OPIR segments. These trades lead to definition, management, maintenance, and evolution of the Next-Gen OPIR Enterprise technical requirements and interface documents to ensure the integrity of the enterprise technical baseline.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Next-Gen OPIR Space, Integration	54.717	31.034	32.234
<p>Description: The Integration (Project 657123) project includes the efforts associated with the Government's primary role and tasks necessary to accomplish the critical lead system integration function with the OPIR enterprise material segments (Next-Gen Geosynchronous Earth Orbit (GEO) (NGG), Next-Gen Polar (NGP), Next-Gen Ground, and the Resilient Missile Warning/ Missile Track (MW/MT) architecture). The Next-Gen OPIR Program Manager is responsible for directing the Next-Gen OPIR current Enterprise architecture, system definition, controls and validates interfaces, ensures compatibility of Next-Gen systems, and develops/manages plans for execution and fielding of the Next-Gen OPIR Enterprise.</p> <p>FY 2024 Plans: Continue to plan and execute the critical lead system integration function across the System of Systems. Activities include NGG space-to-ground compatibility testing and planning for major pre-launch enterprise integration events such as NGG pre-launch readiness testing. Continue development of Space/Ground interface, analysis for the Future Operationally Resilient Ground Evolution (FORGE) Next-Gen GEO Transition, analysis and integration for NGG space vehicle 2 bus integration and intersegment testing. Conduct NGP System level Critical Design Review (CDR) with NGP prime contractor. Conduct System Requirements Review for Survivable/Endurable Next-Gen OPIR requirements. Continue management of missile warning technical baseline and cross-segment requirement verification and test activities. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis experimentation, and prototyping.</p> <p>FY 2025 Plans:</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206442SF / <i>Next Generation OPIR</i>	Project (Number/Name) 657123 / <i>Integration</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Plan and execute the critical lead system integration function across the Next Gen Missile Warning System of Systems, to include systems engineering, process development and execution, requirements analysis and verification, and vertical and horizontal integration, at the system, ground, space, segment, and element levels. Integration supports across the enterprise Next Gen OPIR, to include NGG SV1 final Space to Ground interface testing, launch base confidence testing, launch planning and NGG SV2 mission payload and bus integration, as well as NGP SV1 & SV2 Bus and mission payload development, and Assembly, Integration and Test (AI&T) activities. It also includes integration, test, and evaluation activities to transition SBIRS HEO and GEO onto the Future Operationally Resilient Ground Evolution (FORGE), as well as the planning, development, and integration efforts associated with the Endurable FORGE (E-FORGE) system, which are required to enable the Next Gen OPIR assets to be part of the survivable and endurable architecture. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities</p> <p><i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> FY2024 increased due to inflation and an increase in Integration and Test activities for NGG, NGP and FORGE.</p>			
Accomplishments/Planned Programs Subtotals	54.717	31.034	32.234

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Space Force will exercise complete ownership of the architecture, system definition, technical baseline, and integration of Next-Gen OPIR space and ground segments. While this complex intersegment integration is traditionally performed by a prime contractor under a systems development contract, for Next-Gen OPIR, this approach requires the government to be the integrator. To execute this responsibility, the government leverages systems engineering and integration expertise from the SE&I contractor. The Program Office has been executing this effort through an SSC managed SE&I contract, for which the final option period concludes in 4th Quarter 2023. A new SE&I support contract (one-year base with 6 one-year options) was awarded to Booz Allen Hamilton by GSA in Jan 2022, however two protests delayed the award. Following GAO dismissals of the protest and proposal review activities, GSA provided Authority to Proceed (ATP) on 19 June 2023. The period of performance overlap in the two contracts provides the required time to enable an efficient transition. In this effort, the contractor will be tightly integrated with the government team to assist in executing the government lead system integration and validation function. This function requires system analysis, integration planning, integration execution, leveraging that expertise from the Prime Contractors for NGG, NGP, and FORGE. These prime contractors have System Engineering, Integrations and Test (SEIT) scope on the respective contracts.

The new SE&I contract encompass two functions: first, it primarily supports the Enterprise SE&I effort captured in this Integration Project. Secondly, the contract includes scope to execute SE&I requirements internal to each segment.

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206442SF / <i>Next Generation OPIR</i>	Project (Number/Name) 657123 / <i>Integration</i>
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FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>Next-Gen OPIR GEO to Ground</i>	
Technical Baseline Management	
SV1 Space to Ground Compatibility Test	
SV2 Space to Ground Compatibility Test	
SV1 Pre-Launch Readiness Test	
SV2 Pre-Launch Readiness Test	
SV1 On-Orbit Performance Charaterization/ tuning	
SV2 On-Orbit Performance Characterization/ tuning	
<i>Next-Gen OPIR, Space Polar</i>	
PDR	
CDR	
SV1 Assembly, Integration & Test	
SV2 Assembly, Integration, & Test	
SV1 Ready for Launch	
<i>FORGE - Next-Gen Transition</i>	
Next-Gen GEO Development	
Next-Gen Polar Development	
E-FORGE	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206442SF / <i>Next Generation OPIR</i>	Project (Number/Name) 657123 / <i>Integration</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Next-Gen OPIR GEO to Ground</i>				
Technical Baseline Management	1	2023	4	2028
SV1 Space to Ground Compatibility Test	1	2024	1	2024
SV2 Space to Ground Compatibility Test	2	2026	2	2026
SV1 Pre-Launch Readiness Test	2	2025	2	2025
SV2 Pre-Launch Readiness Test	1	2026	2	2026
SV1 On-Orbit Performance Characterization/tuning	3	2025	4	2025
SV2 On-Orbit Performance Characterization/tuning	3	2027	4	2027
<i>Next-Gen OPIR, Space Polar</i>				
PDR	2	2023	3	2023
CDR	3	2024	4	2024
SV1 Assembly, Integration & Test	2	2024	4	2029
SV2 Assembly, Integration, & Test	3	2025	4	2028
SV1 Ready for Launch	4	2028	4	2028
<i>FORGE - Next-Gen Transition</i>				
Next-Gen GEO Development	1	2023	4	2028
Next-Gen Polar Development	1	2023	4	2029
E-FORGE	2	2024	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206443SF / <i>Next-Gen OPIR -- GEO</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	1,159.193	1,694.933	719.731	510.806	0.000	510.806	449.932	485.770	509.555	519.606	0.000	6,049.526
657120: <i>Next-Gen OPIR Space GEO</i>	1,159.193	1,694.933	719.731	510.806	0.000	510.806	449.932	485.770	509.555	519.606	0.000	6,049.526
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

Next-Generation Overhead Persistent Infrared (Next-Gen OPIR) Geosynchronous Earth Orbit (GEO) (Project 657120): The primary mission is to provide initial missile warning of a ballistic missile attack on the US, deployed forces and allies. The Next-Gen OPIR GEO (NGG) missile warning satellites enhance detection and improve reporting of intercontinental ballistic missile launches, submarine ballistic missile launches, and tactical ballistic missile launches. Development consists of new payloads in a highly resilient bus, providing real-time persistent global infrared coverage to meet validated Joint Requirements Oversight Council (JROC) requirements on current and future space domain demands. The Program Office is acquiring the NGG capability in two contract actions. Phase 1 awarded in August 2018 encompasses requirements analysis, design/development, critical path flight hardware procurement, and risk reduction efforts leading to a System Critical Design Review (CDR) in October 2021. Phase 2 was awarded in January 2021 for the manufacturing, assembly, system integration and test, launch, and early on-orbit test through operational acceptance of NGG satellites 1-3.

The Department has assessed the third Satellite Vehicle (SV) is not required as a result of continued positive performance of the Space-Based Infrared System (SBIRS) constellation and the anticipated full operational capability of the Medium Earth Orbit (MEO), Program Element 1206447SF/ Low Earth Orbit (LEO), Program Element 1206446SF missile tracking constellation. As a result, the program has removed the third satellite development efforts. NGG is now a two SV baseline.

The NGG program has been designated as a Major Capability Acquisition.

NGG program prior year costs from PE 1206443SF (Next-Gen OPIR - GEO), Project 657120 (Next-Gen OPIR Space GEO) of \$1,159.3 million.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Next-Gen OPIR GEO system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 1206392SF and 1206398SF.

This program is in Budget Activity 5, System Development and Demonstration (SDD) because it has passed Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full rate production.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 1206443SF / Next-Gen OPIR -- GEO
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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	1,694.933	719.731	509.910	0.000	509.910
Current President's Budget	1,694.933	719.731	510.806	0.000	510.806
Total Adjustments	0.000	0.000	0.896	0.000	0.896
• 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	0.896	0.000	0.896

Change Summary Explanation

FY 2025: Decrease of \$0.127M due to a realignment to higher priorities; increase of \$1.023M due to inflation rates for non-pay and non-fuel purchases.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
Title: Next-Gen OPIR GEO	1,694.933	719.731	510.806
Description: Development of the Next-Gen OPIR GEO missile warning satellites with a proven bus, new hardened sensors, and auxiliary payloads for increased resilience. The space segment for GEO missile warning satellites consists of a resilient architecture providing real time persistent global equatorial infrared coverage. The first GEO satellite is required in 2025.			
FY 2024 Plans: FY 2024 funds are required to preserve 2025 initial launch capability (ILC) for SV #1, perform space/ground integration activities, and continue build and integration activities for SV #2. Continue Phase 2 efforts to build and deliver 2 GEO SVs. Conduct system-level assembly and test for the GEO SV #1, including space-to-ground testing to enable discovery and correction of defects critical to launch. Conduct environmental thermal-vacuum testing for the fully assembled SV #1. Continue assembly, integration and test of the second payload. Complete testing of the flight mission payload for SV #2 and delivery for integration into the SV. Continue flight hardware procurement for SV #2. Continue efforts to manufacture, build, integrate, and test the GEO SV #2, including subsystem integration and testing. Continue Enterprise Planning and support for secure communications including government-furnished flight cryptologic units, long-haul communications, launch integration efforts, etc., which were carried in the core project cost category in previous years. Rapidly respond to updated intelligence on threats and implement system resiliency and situational awareness necessary to operate in a contested space domain. Activities include, but are not limited to, program office support, studies, technical analysis, modeling, simulation, experimentation, prototyping.			
FY 2025 Plans:			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206443SF / <i>Next-Gen OPIR -- GEO</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Continue Phase 2 efforts to build and deliver 2 GEO SVs. Execute activities to support SV#1 delivery including final space/ground/launch integration, SV testing, and ground test activities. Implement corrective actions for defects and issues discovered during environmental testing. Continue build, integration, and test of SV#2 including system-level assembly and testing to enable discovery and correction of defects critical to launch. Finish MPL#2 build, assembly, integration, and conduct environmental Thermal Vacuum (TVAC) testing. Continue Enterprise planning and support for launch activities and secure communications including government-furnished cryptologic units, long-haul communications, etc. Rapidly respond to updated intelligence on threats and implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p><i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> FY 2025 decreased due to completion of non-recurring engineering and material purchases - and the majority of build and integration activities for SV #1.</p>			
Accomplishments/Planned Programs Subtotals	1,694.933	719.731	510.806

D. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

E. Acquisition Strategy

The Space Force intends to rapidly acquire Next-Gen systems in order to out-pace adversary missile and counterspace threats while maintaining survivable, global missile warning capability sufficient to enable a transition to the future Force Design architecture. Next-Gen OPIR GEO consists of two Next-Gen GEO satellites. The Next-Gen OPIR Space program was designated a Middle Tier Acquisition (MTA) Rapid Prototype effort under Section 804 of the 2016 National Defense Authorization Act (NDAA). The Next-Gen OPIR GEO program was re-designated as an Acquisition Category (ACAT)-1B Major Capability Acquisition program in July 2023. The first GEO satellite is required by 2025. The program office awarded a sole source contract under the authority of a Justification & Authorization document. The Next-Gen GEO Phase 1 contract was awarded in FY 2018, consisting of requirements development, critical path flight hardware procurement, and risk reduction efforts culminating in an October 2021 System Critical Design Review (CDR). The Next-Gen GEO Phase 2 modification was awarded in January 2021, and includes scope for parts procurement, assembly, integration, test, launch, and checkout of 3 GEO space vehicles. The third space vehicle was defunded in the FY2024 PB as a result of continued positive performance of the SBIRS constellation and the anticipated operational capability of the Medium Earth Orbit (MEO), Program Element 1206447SF/ Low Earth Orbit (LEO), Program Element 1206446SF missile tracking constellation. NGG is now a two satellite vehicle baseline.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206443SF / Next-Gen OPIR -- GEO	Project (Number/Name) 657120 / Next-Gen OPIR Space GEO
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Next-Gen OPIR GEO (Phase 1 & 2)	Various	Lockheed Martin; Various : Various	1,104.922	1,574.766	Oct 2022	614.264	Oct 2023	430.229	Oct 2024	-		430.229	1,619.212	5,343.393	6,891.125
Enterprise Crypto	Various	General Dynamics; Various : Various	0.000	-		10.991	Oct 2023	8.407	Oct 2024	-		8.407	1.913	21.311	-
Comm GFP	C/CPFF	Sev1 Tech : El Segundo, CA	0.000	-		2.097	Oct 2023	0.000		-		0.000	0.000	2.097	-
Launch Support	Various	Various : Various	0.000	-		16.492	Oct 2023	8.576	Oct 2024	-		8.576	22.363	47.431	-
SE&I	Various	Various : Various	16.589	3.854	Dec 2022	23.033	Nov 2023	13.461	Nov 2024	-		13.461	112.756	169.693	-
Technical Mission Analysis	RO	Aerospace Corporation : El Segundo, CA	15.201	15.923	Oct 2022	17.505	Oct 2023	17.602	Oct 2024	-		17.602	73.199	139.430	-
Subtotal			1,136.712	1,594.543		684.382		478.275		-		478.275	1,829.443	5,723.355	N/A

Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
FFRDC	RO	Aerospace Corporation : El Segundo, CA	7.756	14.328	Oct 2022	10.267	Oct 2023	10.161	Oct 2024	-		10.161	45.031	87.543	-
A&AS	Various	Various : TBD	14.266	85.656	Feb 2023	24.666	Feb 2024	21.920	Feb 2025	-		21.920	84.317	230.825	-
Other Support	Various	Various : TBD	0.459	0.406	Oct 2022	0.416	Oct 2023	0.450	Oct 2024	-		0.450	2.064	3.795	-
Subtotal			22.481	100.390		35.349		32.531		-		32.531	131.412	322.163	N/A

	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,159.193	1,694.933	719.731	510.806	-	510.806	1,960.855	6,045.518	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206443SF / <i>Next-Gen OPIR -- GEO</i>	Project (Number/Name) 657120 / <i>Next-Gen OPIR Space GEO</i>
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	FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

	FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
Next-Gen OPIR GEO Phase 2																												
SV 2 Critical Flight Hardware Purchases																												
SV 1 Mission Payload Integration & Testing																												
SV 2 Mission Payload Integration & Testing																												
SV 1 Bus Build Integration & Testing																												
SV 2 Bus Build Integration & Testing																												
SV 1 Launch Support																												
SV 1 Ready for Launch																												
SV 1 On-Orbit Testing																												
SV 1 Interim Contractor Operations Support																												
SV 2 Ready for Launch																												
SV 2 On-Orbit Testing																												
SV 2 Interim Contractor Operations Support																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206443SF / <i>Next-Gen OPIR -- GEO</i>	Project (Number/Name) 657120 / <i>Next-Gen OPIR Space GEO</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Next-Gen OPIR GEO Phase 2</i>				
SV 2 Critical Flight Hardware Purchases	1	2023	2	2024
SV 1 Mission Payload Integration & Testing	1	2023	4	2023
SV 2 Mission Payload Integration & Testing	1	2023	3	2024
SV 1 Bus Build Integration & Testing	1	2023	3	2025
SV 2 Bus Build Integration & Testing	1	2024	3	2027
SV 1 Launch Support	1	2024	3	2025
SV 1 Ready for Launch	4	2025	4	2025
SV 1 On-Orbit Testing	1	2026	1	2027
SV 1 Interim Contractor Operations Support	4	2025	4	2029
SV 2 Ready for Launch	4	2027	4	2027
SV 2 On-Orbit Testing	1	2028	4	2028
SV 2 Interim Contractor Operations Support	4	2027	4	2029

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 1206444SF / Next-Gen OPIR -- Polar
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	471.398	849.196	1,013.478	828.878	0.000	828.878	474.689	382.825	345.493	393.488	658.578	5,418.023
657121: Next-Gen OPIR Space, Block 0 Polar	471.398	849.196	1,013.478	828.878	0.000	828.878	474.689	382.825	345.493	393.488	658.578	5,418.023
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

Next-Generation Overhead Persistent Infrared (OPIR) Space, Block 0 Polar (Project 657121): The primary mission is to provide initial missile warning of a ballistic missile attack on the US, its deployed forces, and its allies. Next-Gen OPIR Space enhances detection and improves reporting of intercontinental ballistic missile launches, submarine launched ballistic missile launches, and tactical ballistic missile launches. Development consists of the Next-Gen OPIR Polar (NGP) missile warning satellites with new payloads in a highly resilient bus, providing real-time persistent global infrared coverage to meet validated Joint Requirements Oversight Council (JROC) requirements on current and future space domain demands.

The Program Office is acquiring the NGP capability through three contract phases. Phase 0, awarded in June 2018, encompassed system requirements analysis and risk reduction efforts, which led to a March 2020 System Requirements Review (SRR). Phase 1, awarded in May 2020, encompasses engineering design, unit hardware procurement, component and subsystem qualification and design, critical path flight hardware procurement, and risk reduction efforts leading to a System Critical Design review (CDR) in FY 2024. Phase 2 will award in 3QFY24 for the manufacturing, assembly, integration & test, launch and early on orbit test, through operational acceptance of NGP satellites 1 and 2.

The NGP program has been designated as Major Capability Acquisition.

NGP program prior year costs from PE 1206444SF (Next-Gen OPIR - Polar), Project 657121 (Next-Gen OPIR Space Polar) of 471.4 million.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Next-Gen OPIR Polar system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 1206392SF and 1206398SF.

This program is in Budget Activity 5, System Development and Demonstration (SDD) because it has passed Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full rate production.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 1206444SF / Next-Gen OPIR -- Polar
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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	849.196	1,013.478	897.341	0.000	897.341
Current President's Budget	849.196	1,013.478	828.878	0.000	828.878
Total Adjustments	0.000	0.000	-68.463	0.000	-68.463
• 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	-68.463	0.000	-68.463

Change Summary Explanation

FY 2025: -69.900M; reduced to align with updated cost estimate
FY 2025: -0.224M; realigned for higher priorities
FY 2025: +1.661M; inflation Rates for Non-Pay and Non-Fuel Purchases

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
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Title: Next-Gen OPIR Space, Block 0 Polar	849.196	1,013.478	828.878
Description: Development of the Next-Gen OPIR Polar (NGP) missile warning satellites using a proven bus with modifications, auxiliary payloads for improved resiliency, and new hardened sensors. The Polar space segment will consist of two NGP satellites in a resilient architecture, providing real time persistent infrared coverage of the northern hemisphere.			
FY 2024 Plans: FY 2024 funds are required to execute the program Critical Design Review (CDR) campaign, begin preparations for the production, assembly, test, and launch phase of the program, and preserve FY 2028 initial launch capability (ILC) for satellite vehicle (SV) #1. Conduct critical design activities for communications payload, cryptographic units, auxiliary payloads, satellite bus, mission payload, mission unique ground system, and hardware/software early risk reduction activities to support the CDR. Scheduled activities include Internal Design reviews (IDRs) to demonstrate individual units are at CDR maturity. This will flow into Critical Design Audits (CDAs) to demonstrate subsystem CDR maturity and the Baseline Technical Review 9 (BTR-9), an interim review to synchronize design and analysis cycles, as well as on-going system preparation and execution, to lead to the CDR milestone. Finalize efforts to develop Engineering Design Units and Flight Hardware for component and subsystem qualification of design. Additionally, preparation work for Phase 2 set to be awarded in 3rd Quarter FY 2024, to begin Polar SV #1 Assembly, Integration and Test (AI&T), which will bring the program from CDR through launch, early on orbit testing and			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206444SF / <i>Next-Gen OPIR -- Polar</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>operational acceptance. Procure long lead items to support Phase 2 scheduled dates. Continue Enterprise Planning and support for secure communications including government-furnished flight cryptologic units, long-haul communications, ground integration, launch integration efforts, etc. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2025 Plans: FY 2025 funds are required to preserve FY 2028 ILC for SV #1 and FY 2030 ILC for SV #2, as well as perform space/ground integration activities. Complete Phase 1 contract closeout activities for development activities of spacecraft bus & communication payload and all associated subsystem components. Complete flight hardware procurements for SVs #1 and #2. Continue development of ground and spacecraft flight software and mission data processing algorithms. Continue assembly, integration and test of flight mission payload for SV #1. Continue subsystem component and integration testing, and simulation development for requirements verification. Continue Phase 2 efforts to manufacture, build, integrate, test and launch of the NGP SVs #1 and #2 to include the mission payload, communications payload and satellite bus. Continue activities for system test and factory ops support center planning. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to completing design activities and the majority of non-recurring engineering and hardware purchases for SVs #1 and #2.</p>			
Accomplishments/Planned Programs Subtotals	849.196	1,013.478	828.878

D. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

E. Acquisition Strategy
The Space Force intends to rapidly acquire Next-Gen systems to out-pace adversary missile and counterspace threats while maintaining survivable, global missile warning capability sufficient to enable a transition to the future Force Design Architecture. Next-Gen Polar consists of two satellites. The Next-Gen OPIR Space program was designated a Middle Tier Acquisition (MTA) Rapid Prototype effort under Section 804 of the 2016 National Defense Authorization Act (NDAA). The Next-Gen OPIR Polar program was re-designated as an Acquisition Category (ACAT)-1B Major Capability Acquisition program in Nov 2023. The first Polar satellite is required in FY 2028. The program office awarded a sole source contract under the authority of a Justification & Authorization document. The NGP Phase 0 was awarded in FY 2018, consisting of requirements development, and culminated in a March 2020 SRR. Phase 1 was awarded May 2020, encompassing requirements review, design,

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity
3620F: *Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)*

R-1 Program Element (Number/Name)
PE 1206444SF / *Next-Gen OPIR -- Polar*

development, critical path flight hardware procurement, and risk reduction efforts leading to a System CDR no later than FY 2024 for NGP SVs #1 and #2. Phase 2 will award in 3QFY24, encompassing build, integration, test, launch, and transition to operations for NGP SVs #1 and #2.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206444SF / Next-Gen OPIR -- Polar	Project (Number/Name) 657121 / Next-Gen OPIR Space, Block 0 Polar
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Next-Gen OPIR Space, Polar (Phase 1 & 2)	Various	Northrop Grumman : Various	441.192	780.516	Oct 2022	936.190	Oct 2023	738.513	Oct 2024	-		738.513	1,947.518	4,843.929	-
Enterprise Comm and Crypto	Various	Various : Various	0.000	34.768	Dec 2022	32.200	Dec 2023	7.175	Dec 2024	-		7.175	8.681	82.824	-
Launch Support	Various	Various : Various	0.000	-		-		13.699	Oct 2024	-		13.699	25.773	39.472	-
SE&I	Various	Various : Various	4.399	8.192	Dec 2022	11.630	Dec 2023	10.295	Dec 2024	-		10.295	64.326	98.842	-
Technical Mission Analysis	RO	Aerospace Corporation : El Segundo, CA	9.661	8.775	Oct 2022	12.330	Oct 2023	14.817	Oct 2024	-		14.817	66.045	111.628	-
Subtotal			455.252	832.251		992.350		784.499		-		784.499	2,112.343	5,176.695	N/A

Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
FFRDC	RO	Aerospace Corporation : El Segundo, CA	5.939	4.251	Dec 2022	6.544	Dec 2023	8.554	Dec 2024	-		8.554	38.445	63.733	-
A&AS	Various	Various : Various	10.010	12.520	Feb 2023	14.406	Feb 2024	35.642	Feb 2025	-		35.642	103.240	175.818	-
Other Support	Various	Various : Various	0.197	0.174	Oct 2022	0.178	Oct 2023	0.183	Oct 2024	-		0.183	1.045	1.777	-
Subtotal			16.146	16.945		21.128		44.379		-		44.379	142.730	241.328	N/A

	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	471.398	849.196	1,013.478	828.878	-	828.878	2,255.073	5,418.023	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206444SF / Next-Gen OPIR -- Polar	Project (Number/Name) 657121 / Next-Gen OPIR Space, Block 0 Polar

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Phase 1	
Bus Development	[Redacted]
Mission Payload Development	[Redacted]
Mission Payload PDR	[Redacted]
System PDR	[Redacted]
Mission Payload CDR	[Redacted]
System CDR	[Redacted]
Phase 2	
Phase 2 ATP	[Redacted]
SV 1 Assembly, Integration & Test	[Redacted]
SV 1 Mission Payload Build, Integration & Test	[Redacted]
SV 1 Bus Build, Integration & Test	[Redacted]
SV 2 Assembly, Integration & Test	[Redacted]
SV 2 Mission Payload Build, Integration & Test	[Redacted]
SV 2 Bus Build, Integration & Test	[Redacted]
SV 1 Ready for Launch	[Redacted]

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206444SF / <i>Next-Gen OPIR -- Polar</i>	Project (Number/Name) 657121 / <i>Next-Gen OPIR Space, Block 0 Polar</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Phase 1				
Bus Development	1	2023	1	2025
Mission Payload Development	1	2023	1	2025
Mission Payload PDR	2	2023	2	2023
System PDR	3	2023	4	2023
Mission Payload CDR	2	2024	2	2024
System CDR	3	2024	4	2024
Phase 2				
Phase 2 ATP	3	2024	3	2024
SV 1 Assembly, Integration & Test	3	2024	4	2028
SV 1 Mission Payload Build, Integration & Test	4	2024	4	2026
SV 1 Bus Build, Integration & Test	3	2024	3	2028
SV 2 Assembly, Integration & Test	3	2025	4	2029
SV 2 Mission Payload Build, Integration & Test	4	2025	4	2027
SV 2 Bus Build, Integration & Test	3	2025	4	2029
SV 1 Ready for Launch	4	2028	4	2028

Note

Next-Gen Polar (Project 657121) efforts continue past 2029.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206445SF / <i>Commercial SATCOM (COMSATCOM) Integration</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	18.361	73.501	134.487	0.000	134.487	137.519	75.823	78.320	80.767	0.000	598.778
650140: <i>COMSATCOM</i>	-	3.349	73.501	129.501	0.000	129.501	137.519	75.823	78.320	80.767	0.000	578.780
651126: <i>COMSATCOM Infrastructure</i>	-	15.012	0.000	4.986	0.000	4.986	0.000	0.000	0.000	0.000	0.000	19.998

A. Mission Description and Budget Item Justification

Commercial Satellite Communication (COMSATCOM) Integration develops, prototypes and demonstrates the capabilities required to fully leverage COMSATCOM as part of the Department of Defense's (DoD) SATCOM enterprise. The United States Space Force (USSF) has determined that an enterprise approach to the procurement, delivery and management of its SATCOM capabilities is the best means to create an environment that is responsive to Combatant Commanders and other users across the spectrum of conflict. In addition, an enterprise approach will improve affordability, Department purchasing power and mission assurance. Project 650140, COMSATCOM Enterprise Integration of Fighting SATCOM, will rapidly prototype and deliver Enterprise Management and Control (EM&C) integration tools and mission applications enabling warfighters to operate responsive and resilient SATCOM as a single enterprise. Project 651126, COMSATCOM Infrastructure, will develop and stand up COMSATCOM business and customer management tools, finalizing the Congressionally directed migration from Defense Information Systems Agency (DISA) systems to USSF systems. Development of enhanced COMSATCOM acquisition capabilities leverage enterprise innovation activities focused on transforming how DoD acquires, accesses and deploys COMSATCOM capabilities.

The Luxembourg (LUX) Medium Earth Orbit (MEO) activity is an initial effort for the USSF to partner, explore, prototype, and integrate an international commercial SATCOM service into the DoD SATCOM enterprise. LUX MEO establishes the baseline satellite capability in partnership with the LUX Ministry of Defense (MoD), leveraging the commercial satellite communications system in MEO.

This funding will be used to demonstrate the onboarding of MEO commercial SATCOM services into the SATCOM architecture and Space Data Transport Force Design. Demonstrations will include utilizing Enterprise Management and Control (EM&C) for provisioning and planning, usage of Protected Tactical Waveform (PTW) over MEO Commercial SATCOM and integration of Protected Tactical Enterprise Services (PTES) hubs into commercial SATCOM capable gateways. Early adaption of capability will also be used to prototype and demonstrate fiber resiliency for large gateway backhaul via space. Capacity will further be used to demonstrate platforms use of multi-orbital terminals for Airborne Intelligence, Surveillance, and Reconnaissance (AISR), maritime communications and communications on the move. Luxembourg is also procuring commercial SATCOM services and will contribute to international demonstration and testing of integrated and interoperable ground and space architecture elements. This partnership will also enable additional international partners to join and demonstrate the ability to bulk buy future capacity together to drive cost savings.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206445SF / <i>Commercial SATCOM (COMSATCOM) Integration</i>
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This program is in Budget Activity 5, System Development and Demonstration (SDD) because it has passed Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full rate production.

B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	23.413	73.501	129.249	0.000	129.249
Current President's Budget	18.361	73.501	134.487	0.000	134.487
Total Adjustments	-5.052	0.000	5.238	0.000	5.238
• 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	-4.590	0.000			
• SBIR/STTR Transfer	-0.462	0.000			
• Other Adjustments	0.000	0.000	5.238	0.000	5.238

Change Summary Explanation

FY 2023: -4.590M Space C2 BTR

FY 2025: +5.000M Fund COMSATCOM Commercial Integration Cell (CIC) Tools

FY 2025: +0.238M Inflation Rate for Non-Pay and Non-Fuel Purchases

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206445SF / <i>Commercial SATCOM (COMSATCOM) Integration</i>	Project (Number/Name) 650140 / <i>COMSATCOM</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The backbone of Fighting SATCOM is a SATCOM EM&C capability for an Integrated SATCOM Enterprise. This is the foundation for SATCOM integration into an operational level Command and Control (C2) system that enables the end-to-end sensor-to-shooter execution serving to protect and defend, as well as theatre support missions for United States Space Command (USSPACECOM) and the Theater Combatant Commands. SATCOM EM&C applications will provide critical services to our warfighters to facilitate timely, quality driven battlespace decisions for SATCOM allocation and use. The effort leverages a Development Security Operations (DevSecOps) platform to rapidly prototype and deliver EM&C mission applications enabling responsive, resilient SATCOM as prioritized by SpOC (Space Operations Command) Delta 8, SATCOM Integrated Operations Division (SIOD), and four CSSEs (Consolidated SATCOM Systems Experts). There are four CSSEs which covers Wideband, Narrowband, Protected, and Commercial SATCOM bands. SATCOM EM&C applications are delivered in capability categories identified in the DoD Chief Information Officer's (CIO) Enterprise SATCOM Management and Control (ESC-MC) Implementation Plan. All capability development in FY 2025 will be in direct support to the Implementation Plan. Capabilities are incrementally developed using agile methodology and delivered into subsets identified in the DoD CIO's Implementation Plan, which will support the three imperatives (integrate data management, automate resource allocation, fuse situational awareness) and seven core capabilities (mobility and continuous communications, management common operating environment, enterprise SATCOM situational awareness/common operating picture, automated resource allocation, electromagnetic interference mitigation, continuity of operations, element/enterprise network interface) across the four SATCOM bands.

In addition to USSF developed EM&C capabilities, USSF will demonstrate the onboarding of MEO commercial SATCOM services into the SATCOM architecture and Space Data Transport Force Design. The LUX MEO activity is an initial effort for the USSF to partner, explore, prototype, and integrate an international commercial SATCOM service into the DoD SATCOM enterprise. Demonstrations will include utilizing EM&C for provisioning and planning, usage of PTW over MEO Commercial SATCOM, and integration of PTES hubs into commercial satellite capable gateways. Early adoption of capability will also be used to prototype and demonstrate fiber resiliency for large gateway backhaul via space. Capacity will further be used to demonstrate platforms use of multi-orbital terminals for AISR, maritime communications and communications on the move. Luxembourg is also procuring commercial SATCOM services to contribute to international demonstration and testing of integrated and interoperable ground and space architecture elements. This international partnership intends to demonstrate the ability to jointly procure communication capacity services that will result in a higher return on US DoD SATCOM investment and potentially lead to future international partnering opportunities.

Activity priorities are subject to change based as determined by the operational user (Delta 8).

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Enterprise Integration of Fighting SATCOM	3.349	13.834	64.662
Description: SSC is developing the EM&C capability to support Chief of Space Operations' (CSO) Fighting SATCOM Vision. Leveraging the Capability Roadmap Architecture and Situational Awareness/Common Operating Picture previously developed,			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206445SF / <i>Commercial SATCOM (COMSATCOM) Integration</i>	Project (Number/Name) 650140 / <i>COMSATCOM</i>

B. Accomplishments/Planned Programs (\$ in Millions)

prototyping efforts focus on improving the user interface/experience, integrating global spectrum usage, providing status of SATCOM systems (ground and space), Electro-Magnetic Interference (EMI) characterization, and development of SATCOM registries.

FY 2024 Plans:

FY 2024 funding will be used to continue integration of data sources into the planning and mission management capability areas to include MILSATCOM, Commercial, and International Partner systems. The enterprise situational awareness will continue to include an integrated visualization of SATCOM related terminal and service providers with an addition to mission and threat profiles. Develop mobility and continuous communications through the use of automated resource allocation, and restoral for Enterprise Planning capabilities to facilitate uninterrupted operational roaming by leveraging machine-to-machine interfaces. Advance developed tools to support Electro-magnetic Interface / Radio-Frequency (EMI/RF) characterization and mitigation with EMI reporting, spectral monitoring, and EMI event evolution capabilities. Continue to leverage and mature the DevSecOps platform processes, and other contract vehicles as required, to rapidly deliver and enhance incremental mission applications, infrastructure, IT and cyber efforts. Support implementation of Flexible Network Interface and Flexible Terminal Interface standards, and facilitate data exchange between terminals, network operations centers, and EM&C. All activities include, but are not limited to, program office support, studies, technical analysis, experimentation, prototyping, etc.

FY 2025 Plans:

SATCOM EM&C will continue to leverage the DevSecOps process to rapidly deliver minimal viable products as prioritized by SpOC Delta 8 for user feedback and adoption through a cloud based staging environment accessible at multiple classification levels. While specific priorities will be updated periodically as part of an agile software development methodology, SpOC Delta 8 will provide overall guidance through the Capability Needs Statement and regular meetings to enhance multiple capabilities across the four SATCOM bands (Wideband, Narrowband, Protected, and Commercial). The overarching set of capabilities targeted for FY 2025 will support and/or expand the automation of Delta 8's mission planning/execution processes or allow more efficient usage of Delta 8's manpower. This includes substantial investment in multiple situational awareness capabilities and automating resources, as well as data management. This may support an individual band, some of the four bands, or all four of the bands pending user/stakeholder feedback/prioritization.

Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.

FY 2024 to FY 2025 Increase/Decrease Statement:

FY 2025 budget increased in response to a DoD CIO led increase in support of the recently signed (Dec 2022) ESC-MC Implementation Plan, which requires Data and ESC-MC Network Management Integration beginning in FY 2024 and completing

FY 2023	FY 2024	FY 2025

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206445SF / <i>Commercial SATCOM (COMSATCOM) Integration</i>	Project (Number/Name) 650140 / <i>COMSATCOM</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
in FY 2028 (Phase 2), and implementation of enterprise SATCOM management and control beginning in FY 2026 and concluding in FY 2030 (Phase 3). The budget increase enables SATCOM EM&C to enter the planning phase of the Software Acquisition Pathway in 2nd Quarter FY 2024 and accelerate capability deliveries in support of Phase 2 and 3 of the DoD CIO's Implementation Plan across FY 2025.				
<p>Title: Fund COMSATCOM Commercial Integration Cell (CIC) Tools</p> <p>Description: Enhances commercial integration cell; plus up belongs to Project 651126.</p> <p>FY 2024 Plans: N/A</p> <p>FY 2025 Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: N/A</p>		-	0.000	5.000
<p>Title: International MEO SATCOM</p> <p>Description: US DoD and LUX MoD is pursuing a Global Commercially Contracted (GCC) SATCOM Support Partnership (SP) through the NATO Support and Procurement Agency (NSPA) to establish a contracting mechanism to procure commercially available SATCOM on behalf of both nations and leverage economies of scale. By partnering with the LUX MoD for mPOWER satellite access, the DoD can leverage a multi-year international arrangement to drive affordability, resiliency, and flexibility into military SATCOM architectures that align with USSF SATCOM vision to deploy multi-orbit, multi-frequency capabilities. This international partnership intends to demonstrate the ability to jointly procure communication capacity services that will result in a higher return on US DoD SATCOM investment and lead to future international partnering opportunities.</p> <p>FY 2024 Plans: Procure and integrate with commercial SATCOM services to prototype and demonstrate the capabilities of International Commercial MEO SATCOM. Commercial SATCOM capacity and terminals will support Combatant Command requirements for SATCOM support services and other required commercial support services. Activities include, but are not limited to, program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p>FY 2025 Plans: Continue to procure and integrate with commercial SATCOM services to prototype and demonstrate the capabilities of International Commercial MEO SATCOM. Commercial SATCOM capacity will support Combatant Command requirements for</p>		-	59.667	59.839

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206445SF / <i>Commercial SATCOM (C OMSATCOM) Integration</i>	Project (Number/Name) 650140 / <i>COMSATCOM</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>SATCOM support services and other required commercial support services. Activities include, but are not limited to, program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p>Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p><i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> FY 2025 increased due to inflation.</p>			
Accomplishments/Planned Programs Subtotals	3.349	73.501	129.501

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

Fighting SATCOM Integration leverages Other Transaction Authority (OTA) agreement awards through the Space Enterprise Consortium to rapidly develop prototype capabilities in operationally relevant timelines. Early risk reduction and delivery of first operational prototypes began in FY 2021. Individual prototype efforts are competitively awarded fixed-price agreements leveraging non-traditional defense contractors. SATCOM EM&C is pursuing entry into the Software Acquisition Pathway Planning Phase in 2nd Quarter FY 2024, and approval for entry to the Software Acquisition Execution Phase in FY 2025. As part of the software acquisition pathway, USSF is considering leveraging other acquisition options in addition to the current OTAs to incrementally deliver capability enhancements through multiple vendors, including options to adopt commercially available or open-source solutions instead of developing government unique products. SATCOM EM&C also leverages an SE&I contractor to facilitate a vendor agnostic and government-owned solution for the back end DevSecOps systems to integrate the various contractors into a consolidated EM&C system, maximize competition, guarantee a modular open-ended systems architecture, and coordinate user feedback sessions. Prototyping efforts will work in concert with this strategy.

EM&C is expected to enter the planning phase of the Software Acquisition Pathway in 2nd Quarter FY 2024 and enter execution phase in 2nd Quarter FY 2025.

The LUX MEO COMSATCOM capacity will be acquired by Space Systems Center/Commercial Satellite Communications Office in coordination with the PATS Program Office, SSC/IA, and the NATO Support Procurement Agency (NSPA). The DoD and LUX Minister of Defense activated the Global Commercially Contracted SATCOM Support Partnership with NSPA on 31 October 2022 to enable combined contracting for commercial SATCOM capabilities.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force												Date: March 2024			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)					Project (Number/Name)						
3620F / 5				PE 1206445SF / Commercial SATCOM (C OMSATCOM) Integration					650140 / COMSATCOM						
Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Enterprise Integration of Fighting SATCOM Fusing Situational Awareness, Automating Resource Allocation, and Data Management	Various	Various : TBD	-	1.406	Mar 2023	4.976	Dec 2023	42.656	Nov 2024	-		42.656	Continuing	Continuing	-
Technical Mission Analysis	RO	Aerospace : El Segundo, CA	-	0.987	Feb 2023	0.500	Jan 2024	0.467	Oct 2024	-		0.467	Continuing	Continuing	-
SE&I	C/CPIF	Linquest : El Segundo, CA	-	-		8.303	Feb 2024	17.697	Feb 2025	-		17.697	Continuing	Continuing	-
LUX MEO	TBD	Betzdorf : Luxembourg	-	-		54.895	Nov 2023	54.818	Jan 2025	-		54.818	Continuing	Continuing	-
SBIR/STTR	Allot	Not specified. : TBD	-	-		2.572	Mar 2024	4.662	Mar 2025	-		4.662	0.000	7.234	-
Passback - Fund COMSATCOM CIC Tools	TBD	TBD : TBD	-	-		-		5.000	Mar 2025	-		5.000	Continuing	Continuing	-
Subtotal			-	2.393		71.246		125.300		-		125.300	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
FFRDC	RO	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-
A&AS	Various	Various : TBD	-	0.856	Nov 2022	2.205	Nov 2023	4.101	Nov 2024	-		4.101	0.000	7.162	-
Other Support	TBD	Various : TBD	-	0.100	Oct 2022	0.050	Oct 2023	0.100	Oct 2024	-		0.100	0.000	0.250	-
Subtotal			-	0.956		2.255		4.201		-		4.201	Continuing	Continuing	N/A
Project Cost Totals			-	3.349		73.501		129.501		-		129.501	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force							Date: March 2024			
Appropriation/Budget Activity 3620F / 5			R-1 Program Element (Number/Name) PE 1206445SF / <i>Commercial SATCOM (C OMSATCOM) Integration</i>			Project (Number/Name) 650140 / <i>COMSATCOM</i>				
	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract	

Remarks
 Due to the expected increase in FY 2025 budget, SE&I/A&AS support is expected to also increase.

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206445SF / <i>Commercial SATCOM (C OMSATCOM) Integration</i>	Project (Number/Name) 650140 / <i>COMSATCOM</i>
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FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>Prototyping and Integration</i>	
Electromagnetic Interference Work Up	
Fusing Situational Awareness Capability 1	
Fusing Situational Awareness Capability 2	
Fusing Situational Awareness Capability 3	
Fusing Situational Awareness Capability 4	
Fusing Situational Awareness Capability 5	
Fusing Situational Awareness Capability 6	
Fusing Situational Awareness Capability 7	
SAA/SAR Mission Work Up (Automating Resource Allocation)	
Terminal Orchestration (Automating Resource Allocation)	
Automating Resource Allocation Capability 1	
Automating Resource Allocation Capability 2	
Terminal Registry Service (Data Management)	
Data Management Capability 1	
Data Management Capability 2	
<i>Emerging User Requirements</i>	
Requirements defined by USSF Delta 8	
<i>Prototype Transition</i>	
Transition to operational environment	
<i>Mission Support</i>	

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206445SF / <i>Commercial SATCOM (COMSATCOM) Integration</i>	Project (Number/Name) 650140 / <i>COMSATCOM</i>
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	FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Maintain SATCOM EM&C application, environment, data sources, etc. Integrate new capabilities																												
LUX MEO																												
International MEO SATCOM																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206445SF / <i>Commercial SATCOM (COMSATCOM) Integration</i>	Project (Number/Name) 650140 / <i>COMSATCOM</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Prototyping and Integration</i>				
Electromagnetic Interference Work Up	3	2023	1	2025
Fusing Situational Awareness Capability 1	2	2025	4	2025
Fusing Situational Awareness Capability 2	2	2025	1	2026
Fusing Situational Awareness Capability 3	2	2025	1	2026
Fusing Situational Awareness Capability 4	2	2025	2	2026
Fusing Situational Awareness Capability 5	2	2025	2	2026
Fusing Situational Awareness Capability 6	2	2025	2	2026
Fusing Situational Awareness Capability 7	2	2025	4	2026
SAA/SAR Mission Work Up (Automating Resource Allocation)	1	2023	1	2025
Terminal Orchestration (Automating Resource Allocation)	2	2023	2	2025
Automating Resource Allocation Capability 1	4	2023	4	2025
Automating Resource Allocation Capability 2	2	2025	2	2026
Terminal Registry Service (Data Management)	1	2023	4	2023
Data Management Capability 1	2	2025	3	2026
Data Management Capability 2	2	2025	2	2026
<i>Emerging User Requirements</i>				
Requirements defined by USSF Delta 8	1	2025	4	2029
<i>Prototype Transition</i>				
Transition to operational environment	1	2025	4	2029
<i>Mission Support</i>				

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206445SF / <i>Commercial SATCOM (COMSATCOM) Integration</i>	Project (Number/Name) 650140 / <i>COMSATCOM</i>
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Maintain SATCOM EM&C application, environment, data sources, etc. Integrate new capabilities	1	2023	4	2029
LUX MEO				
International MEO SATCOM	3	2024	3	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 5					R-1 Program Element (Number/Name) PE 1206445SF / <i>Commercial SATCOM (C OMSATCOM) Integration</i>				Project (Number/Name) 651126 / <i>COMSATCOM Infrastructure</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
651126: <i>COMSATCOM Infrastructure</i>	-	15.012	0.000	4.986	0.000	4.986	0.000	0.000	0.000	0.000	0.000	19.998
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In accordance with the FY 2018 National Defense Authorization Act 1601(a), as amended, and on behalf of the CSO and in consultation with the DoD CIO, the USSF Commercial Satellite Communications Office (CSCO), serves as the sole authority for the procurement of COMSATCOM services for the DoD; this responsibility was previously held by DISA. In order to provide the joint warfighter with modernized access to COMSATCOM services and ensure combat effectiveness across all domains, the CSCO requires a comprehensive COMSATCOM Enterprise Technology (COMET) Systems of Systems to provide required business suite financial management and customer and contract support systems. The COMET programs implementation of the COMSATCOM Business Suite (CBS) tool is also critical to complete the Congressionally mandated COMSATCOM mission transition from DISA to USSF. The CBS tool will have multiple components including: (1) Business Suite & Marketplace designed to automate and streamline requests for work and customer interaction, thereby replacing manual processes for over 100 different contracts valued at \$5 billion over the future year defense program; (2) Financial Management System required to operate a new and cutting-edge Enterprise Space Activity Group (ESAG) under the Air Force Working Capital Funds (AFWCF); (3) Integration with third party systems and capabilities, including cloud-based hosting and EM&C - the nexus of future USSF space-based SATCOM C2.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: COMSATCOM Enterprise Technology (COMET) System of Systems	15.012	0.000	4.986
<p>Description: SSC establishment of mission critical COMSATCOM support systems to enable transformational change to the acquisition of COMSATCOM, increasing speed to service, improving quality of service, reducing costs, and laying the foundation to incorporate new industry innovations into the future. Development of the CBS tool will enable transition and enhance the existing COMSATCOM customer-facing tools and background financial management data systems from DISA to the USSF. The CBS tool is required to automate and securely distribute COMSATCOM services and capabilities to stakeholders in order to improve the ordering, billing, activation, provisioning, and other financial management tasks currently leveraging DISA capability.</p> <p>FY 2024 Plans: No funding was requested in FY 2024. Activities in FY 2024 continue from the FY 2023 budget allocation.</p> <p>FY 2025 Plans: Continue the development and standup of CBS tool and integration efforts, finalizing the Congressionally directed transition from DISA working capital to USSF. This includes completing development of financial/customer management systems required to transition COMSATCOM customer business processes from DISA to USSF, applications to manage inventory of commercial</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206445SF / <i>Commercial SATCOM (C OMSATCOM) Integration</i>	Project (Number/Name) 651126 / <i>COMSATCOM Infrastructure</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
services from industry and the user interfaces for customers to order/activate services, and processes and capabilities needed to interconnect sub-systems and to facilitate enterprise connectivity.			
<i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> FY 2025 increased to continue CBS tool development and integration efforts enabling the transition from DISA to USSF.			
Accomplishments/Planned Programs Subtotals	15.012	0.000	4.986

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

The acquisition strategy is to perform competitive awards to qualified contractors via multiple contracting authorities. Efforts will include required compliance tools and processes supporting existing business models, necessary operational readiness updates to existing equipment, and other services required to implement the transition from DISA to USSF. Contracts may be competitively awarded, utilizing a to-be-determined contract type.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206445SF / <i>Commercial SATCOM (COMSATCOM) Integration</i>	Project (Number/Name) 651126 / <i>COMSATCOM Infrastructure</i>
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
CBS Financial Management System	MIPR	DISA : Fort Meade, MD	-	8.358	May 2023	-		1.221	Nov 2024	-		1.221	Continuing	Continuing	-
CBS Marketplace / Enterprise	TBD	TBD : TBD	-	0.000	May 2023	-		1.098	Nov 2024	-		1.098	Continuing	Continuing	-
CSCO Integration	TBD	TBD : TBD	-	0.000	Jul 2023	-		0.680	Nov 2024	-		0.680	Continuing	Continuing	-
SBIR/STTR	TBD	TBD : TBD	-	-		-		0.182	Nov 2024	-		0.182	Continuing	Continuing	-
Subtotal			-	8.358		-		3.181		-		3.181	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
A&AS	Various	Various : TBD	-	2.199	Apr 2023	-		1.250	Nov 2024	-		1.250	Continuing	Continuing	-
CSCO Basing	MIPR	USACE : Hanover, MD	-	4.305	Sep 2023	-		0.455	Nov 2024	-		0.455	Continuing	Continuing	-
Other Support	Various	Various : TBD	-	0.150		-		0.100	Oct 2024	-		0.100	Continuing	Continuing	-
Subtotal			-	6.654		-		1.805		-		1.805	Continuing	Continuing	N/A

	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals		-	15.012	-	4.986	-	4.986	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206445SF / <i>Commercial SATCOM (C OMSATCOM) Integration</i>	Project (Number/Name) 651126 / <i>COMSATCOM Infrastructure</i>

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

COMET System-of-Systems	
CBS Financial Management System	[REDACTED]
CBS Marketplace/Enterprise	[REDACTED]
CSCO Integration	[REDACTED]

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206445SF / <i>Commercial SATCOM (C OMSATCOM) Integration</i>	Project (Number/Name) 651126 / <i>COMSATCOM Infrastructure</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
COMET System-of-Systems				
CBS Financial Management System	3	2023	2	2025
CBS Marketplace/Enterprise	3	2023	4	2025
CSCO Integration	4	2023	4	2025

Note
No funding was requested in FY 2024. Activities in FY 2024 continue from the FY 2023 budget allocation.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 1206446SF I Resilient Missile Warning Missile Tracking - Low Earth Orbit (LEO)
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	786.340	1,266.437	1,730.821	0.000	1,730.821	1,887.813	2,553.739	2,066.041	2,788.691	Continuing	Continuing
657LEO: Resilient MW/MT - LEO	-	786.340	1,266.437	1,730.821	0.000	1,730.821	1,887.813	2,553.739	2,066.041	2,788.691	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Space Development Agency (SDA) is developing and demonstrating next generation space capabilities for the joint warfighter enabled by proliferation of satellites in Low Earth Orbit (LEO) and a new acquisition model utilizing rapid spiral development. SDA is developing capabilities to address a wide range of Department of Defense (DoD) space needs as stated in the National Defense Strategy and DoD Space Vision, including advanced missile tracking and global surveillance enabling beyond-line-of-sight targeting. SDA will orchestrate the rapid development and fielding of the Proliferated Warfighter Space Architecture (PWSA), a resilient military sensing and data transport capability via a proliferated space architecture in LEO. This program element funds the development and demonstration of space technologies to deliver Missile Warning, Missile Tracking and Missile Defense (MW/MT/MD) and Fire Control capabilities to U.S. joint warfighting forces in bi-annual tranches, which began in FY 2022.

This program element may include necessary civilian pay expenses and contractor support required to support delivery of the MW/MT/MD capability.

The total cost of the Tranche 1 (T1) Tracking Layer Middle Tier of Acquisition effort is \$2,745.400 million, including RDT&E and procurement of prototype units. The T1 Tracking Layer RP program is fully funded across the Future Years Defense Program.

The total cost of the Tranche 2 (T2) Tracking Layer Middle Tier of Acquisition effort is \$3,760.600 million, including RDT&E and procurement of prototype units. The T2 Tracking Layer RP program is fully funded across the Future Years Defense Program.

This program is in Budget Activity 5, System Development and Demonstration (SDD) because it has passed Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full rate production.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 1206446SF I Resilient Missile Warning Missile Tracking - Low Earth Orbit (LEO)
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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	786.340	1,266.437	1,004.406	0.000	1,004.406
Current President's Budget	786.340	1,266.437	1,730.821	0.000	1,730.821
Total Adjustments	0.000	0.000	726.415	0.000	726.415
• 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	726.415	0.000	726.415

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 657LEO: Resilient MW/MT - LEO

Congressional Add: INDOPACOM Missile Tracking Demonstration Expansion

Congressional Add: Tranche 1 Space Resiliency Payloads

Congressional Add Subtotals for Project: 657LEO

Congressional Add Totals for all Projects

	FY 2023	FY 2024
	250.000	-
	22.500	-
	272.500	-
	272.500	-

Change Summary Explanation

The increase in FY 2025 from the Previous President's Budget to the Current President's Budget incorporates funding previously programmed under Appropriation 3620, PE 1206448SF and Appropriation 3022, PE 1206446SF.

The increase between the FY 2024 amount and the FY 2025 amount reflects significant increase in Tranche 2 activities for space vehicle development, delivery, and test.

C. Accomplishments/Planned Programs (\$ in Millions)

Title:	FY 2023	FY 2024	FY 2025
Resilient Missile Warning Missile Tracking - Low Earth Orbit (LEO)	513.840	1,266.437	1,730.821
Description: Rapidly develop, deploy and demonstrate prototype architecture that enables resilient Missile Warning/Missile Tracking/Missile Defense enabled by a proliferated Low Earth Orbit (pLEO) architecture. This effort will define, demonstrate, and			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206446SF / <i>Resilient Missile Warning Missile Tracking - Low Earth Orbit (LEO)</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>deliver the architectures and standards necessary to fully populate a Missile Warning/Missile Tracking/Missile Defense LEO layer as part of the PWSA.</p> <p><i>FY 2024 Plans:</i></p> <p>Tranche 1</p> <ul style="list-style-type: none"> - Complete Optical Interoperability Testing (OIT) with Tranche 1 Transport Layer Space Vehicles (SVs) to ensure optical connectivity. - Complete payload proto-qual Assembly, Integration and Testing (AI&T). - Complete space bus proto-qual AI&T. - Produce payloads and space buses and conduct qualification testing. - Integrate payloads and buses and begin final SV system AI&T. - Complete development of space vehicle command, control and telemetry hardware and software systems, test with O&I ground system, and integrate workstations into the PWSA Operations Centers - Continue MW/MT/MD enterprise data integration with networks and fusion applications. - Complete space vehicle FlatSat development and begin operations testing through connections with the operations and integration (O&I) ground segment. - Complete Tracking SV component deliveries and begin vehicle assembly and integration. - Perform Tracking payload ground calibration and begin SV environmental test campaigns. - Continue Fire Control prototype build. - Support investments in facilities, hardware, network management, Ground Entry Points (GEPs), Optical Ground Terminals (OGT), software development, mission payloads, contract services, and any other integration requirements to support the MW/MT/MD enterprise. These efforts will leverage and expand upon existing Mission Data Processing Applications (MDPAPs) and Joint OPIR Ground initiatives to ensure rapid processing and dissemination to global warfighting community. - Support the planning and execution of performance and integration risk mitigation activities associated with C2 challenges, MDP expansion, and interagency integration. Other activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc. <p>Tranche 2</p> <ul style="list-style-type: none"> - Execute Tranche 2 acquisition and source selection processes leading to space vehicle vendor procurement instruments. - Award Tranche 2 Tracking Layer to up to three space vehicle vendors. - Execute Tranche 2 Tracking Layer kick-offs. - Complete Tranche 2 Tracking Layer System Requirements Reviews (SRRs). - Begin Early Integration Studies to support launch. - Begin Tranche 2 Tracking Layer MW/MT/MD enterprise data integration with networks and fusion applications. 			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206446SF / <i>Resilient Missile Warning Missile Tracking - Low Earth Orbit (LEO)</i>
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C. Accomplishments/Planned Programs (\$ in Millions)

- Support investments in facilities, hardware, network management, Ground Entry Points (GEPs), Optical Ground Terminals (OGT), software development, mission payloads, contract services, and any other integration requirements to support the MW/MT/MD enterprise. These efforts will leverage and expand upon existing Mission Data Processing Applications (MDPAPs) and Joint OPIR Ground initiatives to ensure rapid processing and dissemination to global warfighting community.
- Support the planning and execution of performance and integration risk mitigation activities associated with C2 challenges, MDP expansion, and interagency integration. Other activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc.

Proliferated Warfighter Space Architecture (PWSA) Future Programs (PFP)

- Execute Fire-control On Orbit-support-to-the-war Fighter (FOO Fighter), for advanced missile fire control, acquisition and source selection processes leading to space vehicle vendor procurement instruments.
- Award FOO Fighter to space vehicle vendor.
- Execute FOO Fighter award kick-off.
- Complete FOO Fighter initial design through Preliminary Design Review (PDR).
- Complete FOO Fighter System Requirements Reviews (SRR).
- Execute other advanced fire control efforts including Warlock and Strauss.
- Construct ground segment network including a Demonstration Operations Center (DOC).
- Initiate PFP Ground Segment Integration (PGI) effort to provide a common, enduring ground infrastructure and resources to minimize cost and complexity for PFP space vehicle demonstration and experimentation programs (beginning with FOO Fighter and T2DES).

FY 2025 Plans:

Tranche 1

- Complete payload and space bus production and conduct qualification testing.
- Integrate payloads and buses and complete final space vehicle system Assembly, Integration and Testing (AI&T).
- Support Ground Readiness Review (GRR) to ensure integration with PWSA Operations Centers
- Complete initial integration with Missile Warning/Missile Tracking/Missile Defense (MW/MT/MD) enterprise data interfaces and fusion applications.
- Continue space vehicle FlatSat operations testing with the operations and integration (O&I) ground segment.
- Perform Tracking payload ground calibration and complete space vehicle environmental test campaigns.
- Complete Fire Control prototype build.
- Ship space vehicles to launch site and integrate onto the multi-vehicle launch dispensers.
- Conduct readiness for launch and early orbit phase operations and transition to nominal operations.

FY 2023	FY 2024	FY 2025

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>		R-1 Program Element (Number/Name) PE 1206446SF / <i>Resilient Missile Warning Missile Tracking - Low Earth Orbit (LEO)</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<ul style="list-style-type: none"> - Begin conducting on-orbit test and checkout, orbital positioning, and transition operations to the operations centers for each plane of space vehicles. - Begin system level Developmental Testing - Support investments in facilities, hardware, network management, Ground Entry Points (GEPs), Optical Ground Terminals (OGT), software development, mission payloads, contract services, and any other integration requirements to support the MW/MT/MD enterprise. These efforts will leverage and expand upon existing Mission Data Processing Applications (MDPAPs) and Joint OPIR Ground initiatives to ensure rapid processing and dissemination to global warfighting community. - Support the planning and execution of performance and integration risk mitigation activities associated with C2 challenges, MDP expansion, and interagency integration. Other activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc. <p>Tranche 2</p> <ul style="list-style-type: none"> - Complete T2 Tracking Layer Preliminary Design Reviews (PDRs) and Critical Design Reviews (CDRs). - Begin Optical Interoperability Testing (OIT) with Tranche 2 Transport Layer (T2TL) space vehicles to ensure optical connectivity. - Begin payload proto-qual AI&T. - Begin space bus proto-qual AI&T. - Initiate production of payloads and space buses and conduct qualification testing. - Support ground activities to ensure integration with PWSA Operations Centers - Continue MW/MT/MD enterprise data integration with networks and fusion applications. - Begin space vehicle FlatSat development and begin operations testing. - Initiate Tracking space vehicle component deliveries and vehicle assembly and integration. - Planning for Tracking payload ground calibration and begin space vehicle environmental test campaigns. - Begin T2TL Gamma efforts to include support for advanced tactical links and Fire Control. - Support investments in facilities, hardware, network management, Ground Entry Points (GEPs), Optical Ground Terminals (OGT), software development, mission payloads, contract services, and any other integration requirements to support the MW/MT/MD enterprise. These efforts will leverage and expand upon existing Mission Data Processing Applications (MDPAPs) and Joint OPIR Ground initiatives to ensure rapid processing and dissemination to global warfighting community. - Support the planning and execution of performance and integration risk mitigation activities associated with C2 challenges, MDP expansion, and interagency integration. Other activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc. <p>Tranche 3</p> <ul style="list-style-type: none"> - Initiate design requirements for the Tranche 3 Tracking Layer space vehicles as informed by the MW/MT/MD and Fire Control force design analysis. 				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206446SF / <i>Resilient Missile Warning Missile Tracking - Low Earth Orbit (LEO)</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<ul style="list-style-type: none"> - Begin drafting acquisition plan and solicitation for Tranche 3 Tracking Layer. - Coordinate Warfighter Working Group advocacy and feedback on Tranche 3 Tracking Layer acquisition and MW/MT/MD enterprise integration plans. - Coordinate Tranche 3 Tracking Layer performance requirements with the warfighter community. - Support investments in facilities, hardware, network management, Ground Entry Points (GEPs), Optical Ground Terminals (OGT), software development, mission payloads, contract services, and any other integration requirements to support the MW/MT/MD enterprise. These efforts will leverage and expand upon existing Mission Data Processing Applications (MDPAPs) and Joint OPIR Ground initiatives to ensure rapid processing and dissemination to global warfighting community. - Support the planning and execution of performance and integration risk mitigation activities associated with C2 challenges, MDP expansion, and interagency integration. Other activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc. <p>PWSA Future Programs (PFP)</p> <ul style="list-style-type: none"> - FOO Fighter: Vehicle build and initial assembly and test. - Complete facility and network design for the DOC to support demonstrations. - Continue PFP Ground Segment Integration (PGI) effort to provide a common, enduring ground infrastructure and resources to minimize cost and complexity for PFP space vehicle demonstration and experimentation programs (beginning with FOO Fighter and T2DES). - Execute other advanced fire control efforts including Warlock and Strauss. <p>FY 2024 to FY 2025 Increase/Decrease Statement: The increase between the FY 2024 amount and the FY 2025 amount reflects significant increase in Tranche 2 activities for space vehicle development, delivery, and test.</p>			
Accomplishments/Planned Programs Subtotals	513.840	1,266.437	1,730.821

	FY 2023	FY 2024
Congressional Add: INDOPACOM Missile Tracking Demonstration Expansion	250.000	-
FY 2023 Accomplishments: Began development of additional plane of Missile Warning/Missile Tracking Vehicles (SVs) in the PWSA Tranche 1 Tracking Layer (T1TL) to increase global Missile Warning and Missile Tracking coverage in support of combatant commands to include INDOPACOM. This effort completed program kickoff, Systems Requirements Review, and Preliminary Design Review.		
Congressional Add: Tranche 1 Space Resiliency Payloads	22.500	-

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206446SF / <i>Resilient Missile Warning Missile Tracking - Low Earth Orbit (LEO)</i>
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	FY 2023	FY 2024
FY 2023 Accomplishments: Hosted auxiliary resiliency payload on T1TL spacecraft to demonstrate threat detection capability in Low Earth Orbit (LEO). This augments current spacecraft resiliency by detecting directed energy threats and passing data to ground for further processing and characterization. This effort completed program kickoff through critical design review.		
Congressional Adds Subtotals	272.500	-

D. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

E. Acquisition Strategy

Partners for these activities may include Missile Defense Agency (MDA), Space Systems Command (SSC), Space Operations Command (SpOC), Space Training and Readiness Command (STARCOM), DoD Combatant Commands, DoD research centers, small businesses, large defense contractors, commercial space providers, Federally Funded Research and Development Centers, and University Affiliated Research Centers. SDA's Tranche 1 Tracking Layer and Tranche 2 Tracking Layer space systems are being acquired via Firm Fixed Price contracts conducted in accordance with Other Transaction Authority (OT) for prototyping processes.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206446SF / <i>Resilient Missile Warning Missile Tracking - Low Earth Orbit (LEO)</i>	Project (Number/Name) 657LEO / <i>Resilient MW/MT - LEO</i>
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Tranche 1 Tracking Layer	Various	Various : Various	-	510.631	Sep 2023	275.132	Nov 2023	376.990	Nov 2024	-		376.990	Continuing	Continuing	-
Tranche 2 Tracking Layer	Various	Various : Various	-	0.000		766.877	Jan 2024	1,067.156	Nov 2024	-		1,067.156	Continuing	Continuing	-
PWSA Future Programs - Fire Control (Foo Fighter, Warlock)	Various	Various : Various	-	0.000	Sep 2023	221.136	Mar 2024	278.050	Nov 2024	-		278.050	Continuing	Continuing	-
INDOPACOM Missile Tracking Demonstration Expansion (Congressional Add)	Various	Various : Various	-	250.000	Feb 2023	0.000		0.000		-		0.000	Continuing	Continuing	-
Tranche 1 Space Resiliency Payloads (Congressional Add)	Various	Various : Various	-	22.500	Apr 2023	0.000		0.000		-		0.000	Continuing	Continuing	-
Subtotal			-	783.131		1,263.145		1,722.196		-		1,722.196	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
FFRDC Support	RO	Aerospace Corp. : El Segundo, CA	-	3.209	Jan 2023	3.292	Mar 2024	8.625	Dec 2024	-		8.625	Continuing	Continuing	-
Subtotal			-	3.209		3.292		8.625		-		8.625	Continuing	Continuing	N/A

	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	786.340	1,266.437	1,730.821	-	1,730.821	Continuing	Continuing	N/A

Remarks
The worked performed in this PE continues efforts that were previously funded in FY 2022 under RDT&E, Defense-Wide, PE 1206410SDA.

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206446SF / <i>Resilient Missile Warning Missile Tracking - Low Earth Orbit (LEO)</i>	Project (Number/Name) 657LEO / <i>Resilient MW/MT - LEO</i>

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>Resilient Missile Warning Missile Tracking - Low Earth Orbit (LEO)</i>	
Develop, test, and deliver Tranche 1 Tracking Satellites	[REDACTED]
Develop, test, and deliver Tranche 2 Tracking Satellites	[REDACTED]
Ground integration activities	[REDACTED]
<i>INDOPACOM Missile Tracking Demonstration Expansion</i>	
Develop, test, and deliver additional Tranche 1 Tracking WFOV Satellites	[REDACTED]
<i>Tranche 1 Space Resiliency Payloads</i>	
Integrate, test, and deliver hosted payloads on Tranche 1 Tracking WFOV Satellites	[REDACTED]

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206446SF / <i>Resilient Missile Warning Missile Tracking - Low Earth Orbit (LEO)</i>	Project (Number/Name) 657LEO / <i>Resilient MW/MT - LEO</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Resilient Missile Warning Missile Tracking - Low Earth Orbit (LEO)</i>				
Develop, test, and deliver Tranche 1 Tracking Satellites	1	2023	3	2026
Develop, test, and deliver Tranche 2 Tracking Satellites	2	2024	4	2026
Ground integration activities	1	2023	4	2026
<i>INDOPACOM Missile Tracking Demonstration Expansion</i>				
Develop, test, and deliver additional Tranche 1 Tracking WFOV Satellites	3	2023	4	2026
<i>Tranche 1 Space Resiliency Payloads</i>				
Integrate, test, and deliver hosted payloads on Tranche 1 Tracking WFOV Satellites	3	2023	2	2025

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 1206447SF I Resilient Missile Warning Missile Tracking - Medium Earth Orbit (MEO)
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	408.527	538.208	846.349	0.000	846.349	714.718	1,122.441	1,641.784	1,653.557	Continuing	Continuing
657MEO: Resilient MW/MT - MEO	-	408.527	538.208	846.349	0.000	846.349	714.718	1,122.441	1,641.784	1,653.557	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2025, a portion of the RDT&E budget from PE 1206448SF, Resilient Missile Warning Missile Tracking - Integrated Ground Segment, Project 657124 has transferred into PE 1206447SF, Resilient Missile Warning Missile Tracking - Medium Earth Orbit (MEO), Project 657MEO, to centralize USSF and SDA Missile Warning Tracking activities and improve transparency. Ground segment activities now included in this PE are a continuation of activities from PE 1206448SF and does not constitute a New Start.

A. Mission Description and Budget Item Justification

The United States Space Force (USSF) Space Systems Command (SSC) and Space Development Agency (SDA) are collaborating to deliver Overhead Persistent Infrared (OPIR) capabilities, in concert with Department of Defense (DoD) and Intelligence Community (IC) partners, to support a proliferated space architecture that is resilient by design and capable of operating through contested environments. Resilient Missile Warning/Missile Tracking (MW/MT) - Medium Earth Orbit (MEO) space and ground efforts pivot the Department of the Air Force's (DAF) legacy missile warning force design to a more resilient multi-orbit approach to counter advanced missiles, hypersonic glide vehicles, and fractional orbital bombardment threats. MW/MT - MEO is anchored in Missile Warning and Missile Defense Capability Development Document (CDD) requirements validated by the Joint Requirements Oversight Council (JROC). Constellation resiliency is foundational to the DAF Resilient Missile Warning and Tracking force design, therefore, the OPIR Family of Systems, including MW/MT - MEO, is designed to work cohesively to gain and maintain custody of a spectrum of missile threats.

The MEO program will deploy space assets in multiple epochs to allow for incremental capability delivery and to ensure competition throughout the lifecycle of the program. Resilient MW/MT - MEO will bolster legacy Space Based Infrared Satellite (SBIRS) and Next-Gen OPIR capabilities and will independently satisfy all mission area CDD requirements for both missile warning and tracking by as early as FY 2031. FY 2025 funding supports final build, test, and delivery of flight payloads and buses to support Epoch 1 as well as the start of satellite level assembly integration and test. FY 2025 funding includes ground activities previously captured in PE 1206448, Project 657124, that continue ground segment mission data processing application development and integration, command and control software and facilities build and integration into the MEO Space Operations Center (MSOC), and ground entry point site construction to support on-orbit initialization in 4th quarter FY 2026.

Using a Combined Program Office (CPO) construct, SSC, SDA, and the Missile Defense Agency (MDA) are teaming to develop and implement a system-of-systems integration strategy across for Missile Warning, Missile Tracking and Missile Defense constellations supporting low earth orbit, medium earth orbit, geosynchronous orbit and polar orbit regimes. Resilient MW/MT - MEO Epoch 1 is comprised of multiple space and ground lines of effort to include the following space and ground items:
 - Space vehicle development efforts are currently underway with two vendors [Raytheon (RTX) and Millennium Space Systems (MSS)] with contract options currently in place to deliver nine space vehicles; six from MSS and three from RTX.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206447SF / <i>Resilient Missile Warning Missile Tracking - Medium Earth Orbit (MEO)</i>	
<ul style="list-style-type: none"> - Delivery of nine total space vehicles [three RTX and six MSS] includes: design, build, hardware integration, testing, delivery, launch vehicle integration, space vehicle launch & early orbit operations, calibration, tuning, flying, and delivery of formatted two-dimensional tracks into the Real-Time Transfer Service (RTS) for incorporation with other sensors data necessary for warning/tracking requirements and operations. - FY 2023 congressional add allowed for contract award for a third vendor [L3 Harris] previously identified in the original Epoch 1 source selection. The contract is specifically to develop an advanced mission payload that will inform future capability decisions. - Mission data processing and unique ground software contract let on December 2022 - Perform the operations and integration of the space vehicles into the operations center for command and control at the Tools, Applications, and Processing (TAP) lab starting in 2nd quarter FY 2025. - Develop integration command and control and mission data processing software to operate constellation of MEO space vehicles for supporting multiple collection layers. - Additional ground applications for ground resource management and sensor tasking will be included as part of the Operations and Integration contract. - Acquire, build, install, test, and operate ground-based antennas for uplink/downlink of commands and mission data. At least two sites and six apertures are required for Epoch 1, and at least two additional sites and six more apertures are needed for Epoch 2. On contract for first three sites as of December 2022. - Test, assess, and validate sensor performance on the ground and on-orbit to ensure track data is integrated by Program of Record (PoR) data and fusion operational programs such as Future Operationally Resilient Ground Evolution (FORGE) (PE 1206440SF), Ballistic Missile Defense OPIR Architecture, other classified partners and missions, research and development multi-intelligence fusion (PE 1206442SF), and intelligence characterization. SV testing is on contract as of December 2022. Fusion software studies underway with FORGE program as of March 2023. Additional studies planned with Ballistic Missile Defense OPIR Architecture to start in FY 2024. - Mature integrated digital model: support SSC role as the mission area integrator, perform resiliency analyses, baseline future requirements, and assess performance against current and new targets. On contract as of May 2021. <p>Will start Epoch 2 in FY 2025. The program will acquire additional planes of capability for 6-12 Satellites in the first phase of Epoch 2. Will acquire from a prime both SVs as well as ground contractor command and control (C2) and mission data processing (MDP) software. The program will continue to leverage the FORGE framework and TAP Lab for both operations and underlying hardware and software framework services. Will continue the tasking and fusion architecture that began in Epoch 1 for Epoch 2 acquisitions. Furthermore, Epoch 2 will also leverage an ops and integration contractor to assist with on boarding space craft and vendor operations into the TAP Lab. Epoch 2 will expand upon the Ground Entry Points (GEP) to procure additional antennas necessary to support SV planes. Finally, Epoch 2 will also continue the use of model-based systems engineering and digital models to ease integration.</p> <p>This program element may include necessary civilian pay expenses required to manage, execute, and deliver MW/MT capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 1206392SF and 1206398SF.</p> <p>This program is in Budget Activity 5, System Development and Demonstration (SDD) because it has passed Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full rate production.</p>		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 1206447SF I Resilient Missile Warning Missile Tracking - Medium Earth Orbit (MEO)
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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	408.527	538.208	362.250	0.000	362.250
Current President's Budget	408.527	538.208	846.349	0.000	846.349
Total Adjustments	0.000	0.000	484.099	0.000	484.099
• 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	484.099	0.000	484.099

Change Summary Explanation

FY 2025: +339.949M; transfers funding and effort for the MEO Ground Segment portion of shared PE 1206448SF, Project 657124, to PE 1206447SF, Resilient Missile Warning Missile Tracking, Resilient MW/MT - MEO Project 657MEO to centralize Missile Warning Missile Tracking activities and improve transparency.

FY 2025: +142.454M; funds transferred from Procurement, to support development and test activities.

FY 2025: +\$1.696M other adjustment

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
Title: Missile Warning / Missile Tracking - MEO Space and Ground	408.527	538.208	846.349
Description: This activity funds development of MEO satellites, with two launches planned to deliver nine satellites by FY 2027, and ground efforts with operations necessary to deliver Initial Warfighting Capability (IWC) for the combined LEO and MEO architecture. IWC consists of regional tracking, mission management and control, and coordinated regional warning and access validated through on-orbit measurements. After performance validation is complete, prototype sensors will feed data directly to operational warning and defense systems. Furthermore, IWC will provide sensitivity to detect emerging threats, accurate tracking to contain maneuvering targets, and mission data delivery within required latency timelines to close the kill-chain.			
MW/MT MEO Data Fusion: Test, assess, and validate sensor performance on the ground and on-orbit to ensure track data is integrated by PoR data and fusion operational programs such as FORGE (PE 1206440SF), Ballistic Missile Defense OPIR Architecture, other classified partners and missions, research and development multi-intelligence fusion (PE 1206442SF), and intelligence characterization. SV testing is on contract as of December 2022. Fusion software studies underway with FORGE program as of March 2023. Additional early integration support and studies are planned with the Ballistic Missile Defense OPIR			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206447SF / <i>Resilient Missile Warning Missile Tracking - Medium Earth Orbit (MEO)</i>
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C. Accomplishments/Planned Programs (\$ in Millions)

Architecture to start in FY 2024. Additionally in FY 2024, sensor models will begin to be built to support future modeling and simulation activities with the FORGE and Missile Defense program offices.

FY 2024 Plans:

The Space Vehicle CDRs kicks off FY 2024 efforts as the program finalizes two designs. Execute design, development, and integration of a MEO MW/MT constellation from two current vendors. Conduct Space Vehicle and System Critical Design Reviews and proceed to payload and bus build, integration, and test activities. Additionally, FY 2024 activities mature and finalize the crosslink design, communication system, and bus subsystems. Furthermore, completion of long lead spacecraft purchases and establishment of test equipment infrastructure, lab, and clean room processing is planned to support multi-vehicle test assembly. The program will continue to execute and build off of digital models and process workflow established in prior years under the track custody demonstration effort and conduct technical operations in a digital cloud-based ecosystem to host structural, functional, and performance models. Activities may include, but are not limited to: program office support, studies, technical analysis, experimentation, prototyping, etc. Finally, FY 2024 activities are planned to include payload critical design review for a third vendor with all associated model deliveries and hardware/software ground demonstrations.

Vendors will work with the chosen MDP and C2 Ops floor centers to integrate their ground architecture solutions in preparation for pre-launch and early orbit testing. GEP contractor will construct and connect dedicated GEPs in Continental United States (CONUS) and Outside Continental United States (OCONUS) locations with an expected completion in time to support Epoch 1 launch and early orbit operations. Expand development for C2 and MDP to meet the initial warfighter capability for sensitivity, accuracy, and latency of the MW/MT MEO space layer. Investments in FY 2024 will continue for GEP construction, contract services, operations and integration support, and any other general ground infrastructure required to standup an instantiation of the minimum viable ground infrastructure to support Epoch 1 space vehicles. Vendors will begin to incorporate an instantiation of the FORGE MDPAF for MDP and appropriate C2 solutions. Vendors will also leverage and expand upon existing Mission Data Processing Applications and Joint OPIR Ground initiatives to ensure rapid processing and dissemination of Epoch 1 sensor tracks to the global warfighting community. Develop initial integration modelling and simulation test cases and run for early integration testing with fusion and correlation operational warning and tracking systems. Plan and execute performance and integration risk mitigation activities associated with C2 challenges, MDP expansion, and interagency integration. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc.

The program plans to continue acquisition of additional Epoch 1 spacecraft with acceleration funds for up to another plane of capability. Also, to support up to a third plane of Epoch 1 spacecraft, the program added additional acceleration funds in FY 2024 to supplement the Congressional add and aggressively pursue additional Epoch 1 capabilities to address adversary hypersonic

	FY 2023	FY 2024	FY 2025

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206447SF / <i>Resilient Missile Warning Missile Tracking - Medium Earth Orbit (MEO)</i>
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C. Accomplishments/Planned Programs (\$ in Millions)

threats. The program office is allowing each solution to mature and the competition to continue until selecting a vendor for additional spacecraft development

FY 2025 Plans:

Space: Crucial deliveries of payloads and satellite buses from both contractors for integration and assembly. Each vendor intends to deliver at least two flight payloads and satellite buses and start space vehicle level assembly, integration and testing by the end of FY 2025. Complete launch vehicle integration studies and launch vehicle selection for both launches. Initiate Epoch 2 planning activities and award contracts to execute space, ground, and integration. Epoch 2 will build out the architecture for global missile tracking with up to four planes of additional capability.

FY 2025 marks the start of Epoch 2. Notionally, Epoch 2 is set to release a Request For Proposal (RFP) in mid CY 2024 to support a mid FY 2025 contract execution for space, ground, and integration. Epoch 2 will build out the architecture for global missile tracking with up to four planes of additional capability. The USSF began early engagement with industry with Requests For Information in 2023 and has a good understanding on industrial performance capabilities and cost.

Ground: Completion of SV contractor software builds for both Command and Control and Mission Data Processing and continues ground system integration and test into the TAP Lab in Boulder, Colorado. Continue to outfit the MEO Space Operations Center (MSOC) at the TAP Lab, including Ops floor build out allowing separate rooms for proprietary work for each SV vendors. Continue integration of SV vendor ground hardware into the TAP Lab and establish interfacing connectivity between the SV vendors and MSOC. The Operation and Integration (O&I) contractor, Parsons, will facilitate the integration of ground systems into the TAP Lab and will lead the MSOC Authority to Operate cyber security package to establish the MSOC enclave in preparation for initial testing and operations.

Delivery of six Hardware In the Loop (HWIL) test beds (developed by the GEP Contractor, Northrop Grumman), to each of the SV vendors and begin supporting early space vehicle integration and launch and early orbit testing on the testbeds. Deliver the 1st GEP antenna to Schriever Space Force Base (SFB). The contractor plans to deliver one antenna every month until all nine antennas have been delivered to their respective locations. Begin GEP Integration, test, validation, and verification in preparation for launch rehearsals and Launch and Early On-Orbit Test (LEOT) campaign.

MW/MT MEO Data Fusion: Finalize sensor model builds and verification & validation (V&V) campaigns to ensure the fidelity of the models are adequate to be integrated into enterprise sensor test campaigns spanning the entire OPIR architecture. In FY 2025, major simulation and ground test campaign planning will occur to ensure sensor models and live on-orbit data will be ingested at the appropriate missile warning and missile defense test events occurring in FY 2026-2027.

	FY 2023	FY 2024	FY 2025

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 1206447SF I Resilient Missile Warning Missile Tracking - Medium Earth Orbit (MEO)
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>The Ground Preliminary Design Review (PDR) assessed the maturity of the design for both SV contractors' ground solution and GEP antennas. The assessment included a detailed review of the CONOPS to include the interaction between the SV system, subsystems, SV ground, and external factories. The PDR also included a review of the ground hardware design and cyber Security Controls Traceability Matrix (SCTM) for the ground segment to establish an allocated baseline to proceed to a detailed design in Critical Design Review (CDR).</p> <p>Funds allow both space and ground efforts to rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased to continue to execute MEO spacecraft and constellation design, build and test activities and ground activities.</p>			
Accomplishments/Planned Programs Subtotals	408.527	538.208	846.349

D. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
• 1206442SF: Next Generation OPIR	97.770	-	-	-	-	-	-	-	-	-	Continuing Continuing

Remarks

E. Acquisition Strategy

Space: The Resilient MW/MT - MEO initiative began in FY 2019 as Next Gen OPIR "Block 1 Prototype" under the Next Gen OPIR Space Modernization Initiative (SMI) PE1206442SF. Six missile track custody prototype contracts were competitively awarded under this effort which utilized a multi-phased contracting strategy to field an on-orbit "Missile Track Custody Demonstration" or the MTCD space vehicle. Early efforts also included digital engineering risk reduction which serves as the foundation for current Resilient MW/MT- MEO efforts.

In FY 2021, following the completion of the Space Warfighting Analysis Center (SWAC) force design for the MW/MT mission area, MTCD efforts were formalized as Resilient MW/MT - MEO Epoch 1. The May 2021 Epoch 1 contract awards were the result of a free, fair, and open competition where five vendors submitted proposals and two were selected to develop the first six vehicles for fielding no later than FY 2027 as Resilient MW/MT - MEO Epoch 1. The Full Missile Warning/Missile Defense OPIR CDD and Technical Requirements Document (TRD) were included in the RFP. The Space Force will field Epoch 1 capability under current contracts that were competitively awarded for the first three vehicles from each contractor (Space Vehicles 1-6). In May 2022, the Space Force Program Executive Officer (SFPEO) for Space Sensing (SN) approved an acquisition strategy for all of Epoch 1 scope: Vehicles 1-6; additional vehicles to meet performance baseline (at least 3); command and control software; mission data processing software; operations and integration; and at least two GEPs (six total ground antennas) for command and telemetry.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force Date: March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206447SF / <i>Resilient Missile Warning Missile Tracking - Medium Earth Orbit (MEO)</i>
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In January 2023, the SFPEO for SN approved the acquisition strategy for Epoch 1, nine satellites [Millennium Space Systems' delivery of an additional three space vehicles - SV's 4-6]. The program delivered an integrated acquisition strategy for all of Epoch 1 to enter the acquisition pathway as a Middle Tier Acquisition with an advisory board designation expected in FY 2024. The strategy will include acceleration of additional spacecraft as part of the FY 2023 Congressional Add. The Epoch 1 requirements are derived from the Missile Warning and Missile Defense OPIR Enterprise CDD, validated by the JROC in May 2019. Epoch 1 serves as the first delivery of capability targeting regional warning and tracking coverage with launches in 2026. Future epochs are planned for competitive awards and a follow-on acquisition strategy is in development.

Ground: The Space Force will deliver MDP and C2 software development under current contracts that were competitively awarded in FY 2021 under the NG OPIR PE 1206442SF. A contract for the GEPs was awarded via a mission partner (MP) in December 2022, and an O&I contract award in May 2023 under the MW/MT PE 1206447SF. Continuous updates to the C2 and MDP software will be expected, and ground antenna contracts will continue execution led in collaboration with MPs. The program office is leveraging a competitively awarded operations center and integration contract with General Services Administration (GSA) for integrating and testing the ground system. The program developed an acquisition strategy for all of Epoch 1 scope: vehicles 1-6; additional vehicles to meet performance baseline (at least three); command and control software; mission data processing software; operations and integration, and at least six ground antennas for operating the space vehicles. The Epoch 1 requirements are derived from the Missile Warning and Missile Defense OPIR Enterprise CDD, validated by the JROC in May 2019. Epoch 1 serves as the first delivery of capability targeting polar warning and regional tracking coverage with launches in late CY 2026. Future epochs are planned for competitive awards and a follow-on acquisition strategy is still in development. The acquisition strategy for the space and mission-unique ground portions of Epoch 1 were approved by the PEO for Space Sensing in May 2022. Epoch 2 is submitting its acquisition strategy in 2Q FY 2024 for consideration by the SAE on the acquisition pathway and scope.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206447SF / <i>Resilient Missile Warning Missile Tracking - Medium Earth Orbit (MEO)</i>	Project (Number/Name) 657MEO / <i>Resilient MW/MT - MEO</i>
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
MW/MT MEO Epoch 1, Vendor 1 SV 1-3	Various	Raytheon : El Segundo, CA	-	111.279	Dec 2022	197.840	Dec 2023	283.688	Dec 2024	-		283.688	Continuing	Continuing	-
MW/MT MEO Epoch 1, Vendor 2 SV 1-3	C/Various	Millennium Space Systems : El Segundo, CA	-	74.722	Mar 2023	64.380	Dec 2023	81.001	Dec 2024	-		81.001	Continuing	Continuing	-
MW/MT MEO Epoch 1, Vendor 2 SV 4-6	C/FFP	Millennium Space Systems : El Segundo, CA	-	-		109.860	Dec 2023	58.000	Dec 2024	-		58.000	Continuing	Continuing	-
MW/MT MEO Epoch 1, Acceleration Vendor 1 SV 1-3	Various	Raytheon : El Segundo, CA	-	39.281	Sep 2023	-		-		-		-	Continuing	Continuing	-
MW/MT MEO Epoch 1, Acceleration Vendor 2 SV 1-3	C/Various	Millennium Space Systems : El Segundo, CA	-	40.981	Sep 2023	-		-		-		-	Continuing	Continuing	-
MW/MT MEO Epoch 1, Acceleration Vendor 2 SV 4-6	C/FFP	Millennium Space Systems : El Segundo, CA	-	25.303	Aug 2023	-		-		-		-	Continuing	Continuing	-
MW/MT MEO Epoch 1, Vendor 3	C/FFP	L3 Harris : Melbourne, FL	-	29.738	May 2023	-		-		-		-	Continuing	Continuing	-
MW/MT MEO Epoch 1 Acceleration	TBD	TBD : TBD	-	-		147.547	Dec 2023	-		-		-	Continuing	Continuing	-
MW/MT MEO Operations & Integration (O&I)	MIPR	Parsons : Centreville, VA	-	10.958	Mar 2023	-		15.000	Jan 2025	-		15.000	Continuing	Continuing	-
MW/MT MEO Ground Entry Point (GEP)	MIPR	Northrop Grumman : Fairfax, VA	-	51.100	Mar 2023	-		43.700	Jan 2025	-		43.700	Continuing	Continuing	-
MW/MT MEO Data Fusion	Various	Various : Various	-	2.384	Mar 2023	-		21.400	Jan 2025	-		21.400	Continuing	Continuing	-
MW/MT MEO Epoch 2	TBD	TBD : TBD	-	-		-		280.000	Jun 2025	-		280.000	Continuing	Continuing	-
Enterprise SE&I	Various	Various : Various, CA	-	7.845	Dec 2022	2.524	Dec 2023	9.566	Dec 2024	-		9.566	Continuing	Continuing	-
Technical Mission Analysis	RO	Aerospace : El Segundo, CA	-	1.963	Dec 2022	1.343	Jan 2024	3.645	Jan 2025	-		3.645	Continuing	Continuing	-

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206447SF / <i>Resilient Missile Warning Missile Tracking - Medium Earth Orbit (MEO)</i>	Project (Number/Name) 657MEO / <i>Resilient MW/MT - MEO</i>

	FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

	FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Resilient Missile Warning/Missile Tracking - Space																												
Epoch 1 Payload Critical Design Review	█																											
Epoch 1 Sensor / Mission Data Processing development	█				█																							
Epoch 1 Design, Production & Build of SVs	█				█																							
Epoch 1 System Critical Design Review					█																							
Epoch 1 Mission Payload Assembly, Integration & Test					█																							
Epoch 1 Bus Assembly, Integration & Test					█																							
Epoch 1 SV Assembly, Test & Launch Operations									█																			
Epoch 1 Vendor 1 Ready for Launch													█															
Epoch 1 Vendor 2 Ready for Launch													█															
Epoch 1 On-Orbit Experimentation/Demo																	█											
Epoch 2 Contract Authority to Proceed									█																			
Epoch 2 Design									█																			
Epoch 2 SV Build, Integrate, Test													█															
Resilient Missile Warning/Missile Tracking - Ground																												
Mission Data Processing design, build, integration & test	█																											
Command & Control design, build, integration & test	█																											
GEP selection criteria	█																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206447SF / <i>Resilient Missile Warning Missile Tracking - Medium Earth Orbit (MEO)</i>	Project (Number/Name) 657MEO / <i>Resilient MW/MT - MEO</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Resilient Missile Warning/Missile Tracking - Space</i>				
Epoch 1 Payload Critical Design Review	1	2023	1	2023
Epoch 1 Sensor / Mission Data Processing development	2	2023	2	2025
Epoch 1 Design, Production & Build of SVs	2	2023	2	2026
Epoch 1 System Critical Design Review	4	2023	1	2024
Epoch 1 Mission Payload Assembly, Integration & Test	1	2024	1	2026
Epoch 1 Bus Assembly, Integration & Test	1	2024	2	2026
Epoch 1 SV Assembly, Test & Launch Operations	4	2025	1	2027
Epoch 1 Vendor 1 Ready for Launch	4	2026	4	2026
Epoch 1 Vendor 2 Ready for Launch	4	2026	4	2026
Epoch 1 On-Orbit Experimentation/Demo	1	2027	4	2029
Epoch 2 Contract Authority to Proceed	3	2025	3	2025
Epoch 2 Design	3	2025	3	2026
Epoch 2 SV Build, Integrate, Test	3	2026	4	2029
<i>Resilient Missile Warning/Missile Tracking - Ground</i>				
Mission Data Processing design, build, integration & test	1	2023	4	2029
Command & Control design, build, integration & test	1	2023	4	2029
GEP selection criteria	1	2023	2	2023
Initial Operating Capability for Ground Operations	1	2023	4	2026
Complete MSOC Selections	1	2023	2	2023
GEPs ready for end-to-end testing	1	2025	2	2026

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206447SF / <i>Resilient Missile Warning Missile Tracking - Medium Earth Orbit (MEO)</i>	Project (Number/Name) 657MEO / <i>Resilient MW/MT - MEO</i>

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
GEP Contract Support	2	2023	4	2029
GEP site surveys complete	2	2023	2	2023
GEP contract award	2	2023	2	2023
Build and deploy GEP testbeds to contractor facilities	2	2023	4	2024
MSOC ground network infrastructure design and construction, hardware installation and checkout	2	2023	4	2026
MEO Data Fusion	2	2023	4	2027
MSOC fit up: Ops room fit up, HVAC and power, furnish workstations	2	2023	4	2026
Ground System PDR O&I	2	2024	2	2024
GEP sites design, development, and integration & test	2	2023	3	2026
GEP site construction	4	2024	2	2026
MSOC ready for end-to-end testing with GEPs and SCN	1	2025	4	2026

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 1206448SF I Resilient Missile Warning Missile Tracking - Integrated Ground Segment
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	0.000	505.569	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
657124: Resilient MW/MT	-	0.000	505.569	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
 In FY 2025 and beyond, funds in Program Element (PE) 1206448SF (Resilient Missile Warning Missile Tracking - Integrated Ground Segment), Project 657124 (Resilient MW/MT) were transferred to PE 1206446SF (Resilient Missile Warning Missile Tracking - Low Earth Orbit (LEO)), Project 657LEO (Resilient MW/MT - LEO) and to PE 1206447SF (Resilient Missile Warning Missile Tracking - Medium Earth Orbit (MEO)), Project 657MEO (Resilient MW/MT - MEO).

A. Mission Description and Budget Item Justification

The United States Space Force (USSF) Space Systems Command (SSC) and Space Development Agency (SDA) are collaborating to deliver Overhead Persistent Infrared (OPIR) capabilities, in concert with Department of Defense (DoD) and Intelligence Community (IC) partners, to support a proliferated space architecture that is resilient by design and capable of operating through contested environments. SSC Resilient Missile Warning/Missile Tracking (MW/MT) - Medium Earth Orbit (MEO) space and ground efforts pivot the Department of the Air Force's (DAF) legacy missile warning force design to a more resilient multi-orbit approach to counter advanced missiles, hypersonic glide vehicles, and fractional orbital bombardment threats. MW/MT - MEO is anchored in Missile Warning and Missile Defense Capability Development Document (CDD) requirements validated by the Joint Requirements Oversight Council (JROC). Constellation resiliency is foundational to the DAF Resilient Missile Warning and Tracking force design, therefore, the OPIR Family of Systems, including MW/MT - MEO, is designed to work cohesively to gain and maintain custody of a spectrum of missile threats.

The MEO program will deploy space assets in multiple epochs to allow for incremental capability delivery and to ensure competition throughout the lifecycle of the program. Resilient MW/MT - MEO will bolster legacy Space Based Infrared Satellite (SBIRS) and Next-Gen OPIR capabilities and will independently satisfy all mission area CDD requirements for both missile warning and tracking by as early as FY 2031.

To support the LEO Space layer specific ground functions, SDA's ground segment provides constellation management, ground-based data processing, dissemination, and management, space-to-ground verification and ground-based interoperability testing, support operations, and other integration activities for the SDA Tracking Layer and integrates it with the Missile Warning/Missile Tracking/Missile Defense (MW/MT/MD) enterprise. As a part of the Proliferated Warfighter Space Architecture (PWSA), the LEO MW/MT/MD ground segment leverages the Tranche 1 (T1) Transport Layer, and T1 Operations and Integration (O&I) Centers to provide MW/MT data to the Warfighter anywhere in the world. The T1 Tracking Layer, awarded in FY 2022, is the minimum viable product proliferated satellite constellation to provide global access for tracking of Hypersonic Glide Vehicles and other advanced missile threats. This program element funds required upgrades to the SDA ground segment in order to provide command and control, mission data processing, low latency data dissemination, support operations, and other ground functions to support the capabilities for T1 and future tranches.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force Date: March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206448SF / <i>Resilient Missile Warning Missile Tracking - Integrated Ground Segment</i>
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Using a Combined Program Office (CPO) construct, SSC, SDA, and the Missile Defense Agency (MDA) are teaming to develop and implement a system-of-systems integration strategy across for MW/MT/MD constellations supporting LEO, MEO, and GEO/Polar orbit regimes. Resilient MW/MT - MEO Epoch 1 is comprised of multiple space and ground lines of effort to include following ground items:

- Develop mission data processing, on contract as of December 2022 and mission unique ground software.
- Perform the operations and integration of the space vehicles into the operations center for command and control at the Tools, Applications, and Processing (TAP) lab. Plan to have operations and integration contract award for MEO no later than 3rd quarter FY 2023.
- Develop command and control software to enable traditional tracking, telemetry, commanding, tipping, and cueing across multiple collection layers. On contract as of December 2022. Additional ground applications (such as the ground resource manager) planned as part of the Operations and Integration contract in Summer 2023.
- Acquire, build, install, test, and operate ground-based antennas for uplink/downlink of commands and mission data. At least two sites and six apertures are required for Epoch 1. On contract as of February 2023.
- Test, assess, and validate sensor performance on the ground and on-orbit to ensure track data is integrated by Program of Record (PoR) data and fusion operational programs such as Future Operationally Resilient Ground Evolution (FORGE) (PE 1206440SF), Ballistic Missile Defense OPIR Architecture, other classified partners and missions, research and development multi-intelligence fusion (PE 1206442SF), and intelligence characterization. SV testing is on contract as of December 2022. Fusion software studies underway with FORGE program as of March 2023. Additional studies planned with Ballistic Missile Defense OPIR Architecture to start in FY 2024.
- Mature integrated digital model: support SSC's role as the mission area integrator, perform resiliency analyses, baseline future requirements, and assess performance against current and new targets. On contract as of May 2021.

The total cost of the Tranche 1 (T1) Tracking Layer Middle Tier of Acquisition effort is \$2,745.400 million, including RDT&E and procurement of prototype units. The T1 Tracking Layer RP program is fully funded across the Future Years Defense Program.

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

This program is in Budget Activity 5, System Development and Demonstration (SDD) because it has passed Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full rate production.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 1206448SF I Resilient Missile Warning Missile Tracking - Integrated Ground Segment
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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	0.000	505.569	560.467	0.000	560.467
Current President's Budget	0.000	505.569	0.000	0.000	0.000
Total Adjustments	0.000	0.000	-560.467	0.000	-560.467
• 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	-560.467	0.000	-560.467

Change Summary Explanation

FY 2025: +\$2.899M; for inflation rates increase

FY 2025: +\$10M; for OPIR Ground Enhancements

FY 2025: +41.260M; to fund MW/MT to Full Operational Capability

FY 2025: -\$239.227M; transfer to PE 1206446SF (Resilient Missile Warning Missile Tracking - Low Earth Orbit (LEO)), Project 657LEO (Resilient MW/MT - LEO) to centralize Missile Warning Missile Tracking activities and improve transparency.

FY 2025: -\$321.1M; transfer to PE 1206447SF (Resilient Missile Warning Missile Tracking - Medium Earth Orbit (MEO)), Project 657MEO (Resilient MW/MT - MEO) to centralize Missile Warning Missile Tracking activities and improve transparency.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
Title: Missile Warning (MW)/ Missile Tracking (MT) Ground Low Earth Orbit (LEO)	0.000	252.785	0.000
Description: Expands the existing Proliferated Warfighter Space Architecture (PWSA) to meet the Command and Control (C2), Mission Data Processing (MDP), Enterprise Integration, and Support Operations requirements for the Tranche 1 (T1) Tracking Layer and Tranche 2 (T2) Tracking Layer. The LEO MW/MT ground segment provides constellation management, ground-based data processing, dissemination, and management, space-to-ground verification and ground-based interoperability testing, support operations, and other integration activities for the SDA T1 Tracking Layer and integrates with the MW/MT/MD enterprise. This			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>		R-1 Program Element (Number/Name) PE 1206448SF / <i>Resilient Missile Warning Missile Tracking - Integrated Ground Segment</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
includes the connection of T1 Operations centers with legacy and emerging MW/MT/MD capabilities to disseminate MW/MT/MD data in common message formats for rapid response to advanced missile threat.				
<p>FY 2024 Plans: Continue executing the PWSA T1 programs initiated in FY 2022 to complete the LEO MW/MT ground segment required to support launches starting in FY 2025 and capability demonstration starting in FY 2026. Complete a Ground Readiness Review (GRR) to ensure integration with the Operations Centers and prepare for Missile Warning/ Missile Tracking integration. Continue developing the ground segment for T1. Begin planning to expand the T1 ground system to accommodate more satellite vehicles, greater volumes of sensor data, and add fire control sensors to deliver Missile Defense capability in addition to Missile Warning and Tracking in future tranches. This line supports investments in facilities, hardware, network management, Ground Entry Points (GEPs), Optical Ground Terminals (OGT), software development, mission payloads, contract services, and any other integration requirements to support the MW/MT/MD enterprise. These efforts will leverage and expand upon existing Mission Data Processing Applications (MDPAPs) and Joint OPIR Ground initiatives to ensure rapid processing and dissemination to global warfighting community. In addition, this effort will support the planning and execution of performance and integration risk mitigation activities associated with C2 challenges, MDP expansion, and interagency integration. Other activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p>FY 2025 Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to funding transfer to PE 1206446SF (Resilient Missile Warning Missile Tracking - Low Earth Orbit (LEO)), Project 657LEO (Resilient MW/MT - LEO) to centralize Missile Warning Missile Tracking activities and improve transparency.</p>				
<p>Title: Missile Warning (MW)/ Missile Tracking (MT) - Ground - Medium Earth Orbit (MEO)</p> <p>Description: The Force Design and AoA laid out the initial framework and funding for the Space Force to aggressively pursue MEO satellites and ground by using spiral development to continue competition, control costs, insert technology when mature, and deliver capability incrementally.</p> <p>To responsively deliver capabilities, this PE will fund continued development of the MEO efforts through two launches in late calendar year 2026 and operations in support of an initial warfighting capability for the combined LEO and MEO ground architecture. Initial Warfighting Capability is comprised of validating through on-orbit measurements the ability for regional tracking, mission management and control, and coordinated regional warning and access. After performance validation is complete, sensors will feed data directly to operational warning and defense systems. The initial warfighting capability will provide</p>		0.000	252.784	0.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 1206448SF I Resilient Missile Warning Missile Tracking - Integrated Ground Segment
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>sensitivity to detect emerging threats, accurate tracking to contain maneuvering targets, and deliver data within the required latency to close the kill-chain solution.</p> <p>FY 2024 Plans: Vendors will work with the chosen MDP and C2 Ops floor centers to integrate their ground architecture solutions in preparation for pre-launch and early orbit testing. GEP contractor will construct and connect dedicated GEPs in Continental United States (CONUS) and Outside Continental United States (OCONUS) locations with an expected completion in time to support Epoch 1 launch and early orbit operations. Expand development for C2 and MDP to meet the initial warfighter capability for sensitivity, accuracy, and latency of the MW/MT MEO space layer. In FY 2024 the TAP lab will begin to be outfitted with, hardware, software, and ground. Investments in FY 2024 will continue for GEP construction, contract services, operations and integration support, and any other general ground infrastructure required to standup an instantiation of the minimum viable ground infrastructure to support Epoch 1 space vehicles. Vendors will begin to incorporate an instantiation of the FORGE MDPAF for MDP and appropriate C2 solutions. Vendors will also leverage and expand upon existing Mission Data Processing Applications and Joint OPIR Ground initiatives to ensure rapid processing and dissemination of Epoch 1 sensor tracks to the global warfighting community. Develop initial integration modelling and simulation test cases and run for early integration testing with fusion and correlation operational warning and tracking systems. Plan and execute performance and integration risk mitigation activities associated with C2 challenges, MDP expansion, and interagency integration. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p>FY 2025 Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to transfer to PE 1206447SF (Resilient Missile Warning Missile Tracking - Medium Earth Orbit (MEO)), Project 657MEO (Resilient MW/MT - MEO) to centralize Missile Warning Missile Tracking activities and improve transparency.</p>			
Accomplishments/Planned Programs Subtotals	0.000	505.569	0.000

D. Other Program Funding Summary (\$ in Millions)									Cost To		
<u>Line Item</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u> <u>Base</u>	<u>FY 2025</u> <u>OCO</u>	<u>FY 2025</u> <u>Total</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>FY 2029</u>	<u>Complete</u>	<u>Total Cost</u>
• SPSF 01 1206447SF: Resilient Missile Warning Missile Tracking - Medium Earth Orbit (MEO)	408.527	538.208	846.349	-	846.349	714.718	1,122.441	1,641.784	1,653.557	Continuing	Continuing

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206448SF / <i>Resilient Missile Warning Missile Tracking - Integrated Ground Segment</i>
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D. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u> <u>Base</u>	<u>FY 2025</u> <u>OCO</u>	<u>FY 2025</u> <u>Total</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>FY 2029</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 1206442SF: <i>Next Generation OPIR</i>	97.770	-	-	-	-	-	-	-	-	Continuing	Continuing

Remarks

E. Acquisition Strategy

LEO: SDA will continue execution of contracts competitively awarded in FY 2022 using funds from RDT&E program elements 1206310SDA, 1206410SDA, and 1206446SF. The SDA T1 programs will execute approved acquisition strategies to deliver a LEO proliferated constellation under the Middle Tier of Acquisition prototyping pathway. Additionally, SDA will begin T2 activities during this period, which will include warfighter council approval of acquisition plans, and award of T2 contracts. The T1 Tracking Layer will be the initial capability to support the architecture derived from the Missile Warning and Missile Defense OPIR Enterprise CDD, validated by the Joint Requirements Oversight Council (JROC) in May 2019. T2 will expand on the T1 Tracking Layer with additional satellites and fire control capability to support global coverage in LEO for the MW/MT/MD mission in order to close the kill chain with low latency. The MW/MT/MD - Ground - LEO project will leverage the efforts in all of the SDA T1 programs to provide low latency MW/MT/MD data to the enterprise.

MEO: The Space Force will deliver mission data processing and command and control software development under current contracts that were competitively awarded in FY 2021 under the NG OPIR PE 1206442SF. A contract for the GEPs was awarded via a mission partner Jul 2023, and an Operations and integration contract was awarded in May 2023 under the MWMT PE 1206447SF. Consistent updates to the Command and Control (C2) and Mission Data Processing (MDP) software will be expected and Ground antenna contracts will continue execution led in collaboration with mission partners. The program office is leveraging a competitively awarded operations center and integration contract with General Services Administration (GSA). The program developed an acquisition strategy for all of Epoch 1 scope: vehicles 1-6; additional vehicles to meet performance baseline (at least 3); command and control software; mission data processing software; operations and integration, and at least six ground antennas for command & telemetry. The Epoch 1 requirements are derived from the Missile Warning and Missile Defense OPIR Enterprise CDD, validated by the JROC in May 2019. Epoch 1 serves as the first delivery of capability targeting polar warning and regional tracking coverage with launches in late FY 2026. Future epochs are planned for competitive awards and a follow-on acquisition strategy is still in development. The acquisition strategy for the space and mission-unique ground portions of Epoch 1 were approved by the PEO for Space Sensing in May 2022.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206448SF / <i>Resilient Missile Warning Missile Tracking - Integrated Ground Segment</i>	Project (Number/Name) 657124 / <i>Resilient MW/MT</i>
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
LEO: MW/MT Ground Low Earth Orbit (LEO)	Various	multiple : multiple	-	-		252.784	Nov 2023	-		-		-	Continuing	Continuing	-
MEO: Ground, Test, and Integration, Vendor 1	Various	Raytheon : El Segundo, CA	-	-		61.004	Dec 2023	-		-		-	Continuing	Continuing	-
MEO: Ground, Test, and Integration, Vendor 2	Various	Millennium : El Segundo, CA	-	-		67.938	Dec 2023	-		-		-	Continuing	Continuing	-
MEO: Ground Entry Point (GEP)	MIPR	Northrop Grumman : Fairfax, VA	-	-		71.000	Jan 2024	-		-		-	Continuing	Continuing	-
MEO: Operations and Integration (O&I)	Various	TBD : TBD	-	-		15.000	Jan 2024	-		-		-	Continuing	Continuing	-
MEO: Data Fusion	Various	TBD : TBD	-	-		21.000	Jan 2024	-		-		-	Continuing	Continuing	-
MEO: Enterprise SE&I	Various	Various : TBD	-	-		2.524	Dec 2023	-		-		-	Continuing	Continuing	-
MEO: Technical Mission Analysis	RO	Aerospace : El Segundo, CA	-	-		1.343	Jan 2024	-		-		-	Continuing	Continuing	-
Subtotal			-	-		492.593		-		-		-	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MEO: FFRDC	RO	Aerospace Corp. : El Segundo, CA	-	-		3.245	Jan 2024	-		-		-	Continuing	Continuing	-
MEO: A&AS	Various	Various : Various	-	-		9.731	Nov 2023	-		-		-	Continuing	Continuing	-
Subtotal			-	-		12.976		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		-	-	505.569	-	-	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force							Date: March 2024		
Appropriation/Budget Activity 3620F / 5			R-1 Program Element (Number/Name) PE 1206448SF / <i>Resilient Missile Warning Missile Tracking - Integrated Ground Segment</i>			Project (Number/Name) 657124 / <i>Resilient MW/MT</i>			

	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
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Remarks
 Submitted FY 2024 realignment for PE 1206446SF, Resilient Missile Warning Missile Tracking - Low Earth Orbit (LEO) and to PE 1206447SF, Resilient Missile Warning Missile Tracking - Medium Earth Orbit (MEO).

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206448SF / <i>Resilient Missile Warning Missile Tracking - Integrated Ground Segment</i>	Project (Number/Name) 657124 / <i>Resilient MW/MT</i>
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FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Ground System CDR	████████████████████
MEO: Data Fusion	████████████████████
GEP testbeds delivered to factories 12-18 months before deploying to ops center	████████████████████

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206448SF / <i>Resilient Missile Warning Missile Tracking - Integrated Ground Segment</i>	Project (Number/Name) 657124 / <i>Resilient MW/MT</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
LEO: Resilient Missile Warning/Missile Tracking				
Ground infrastructure design, build, integration & trust	1	2024	4	2024
Mission Data Processing design, build, integration & test	1	2024	4	2024
Command & Control design, build, integration & test	1	2024	4	2024
MEO: Resilient Missile Warning/Missile Tracking				
Mission Data Processing design, build, integration & test	1	2024	4	2024
Command & Control design, build, integration & test	1	2024	4	2024
Initial Operating Capability for Ground Operations	1	2024	4	2024
GEP Contract Support	1	2024	4	2024
Build and deploy GEP test beds to contractor facilities	1	2024	4	2024
MIOC fit up: Ops room fit up, HVAC and power, furnish workstations	1	2024	4	2024
MIOC ground network infrastructure design and construction, hardware installation and checkout	1	2024	4	2024
GEP sites design, development, and integration and test	1	2024	4	2024
GEP site construction	1	2024	4	2024
Ground System CDR	1	2024	3	2024
MEO: Data Fusion	1	2024	4	2024
GEP testbeds delivered to factories 12-18 months before deploying to ops center	1	2024	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206853SF / <i>National Security Space Launch Program (SPACE) - EMD</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	224.421	82.188	23.392	0.000	23.392	7.289	2.828	4.325	4.411	0.000	348.854
650006: <i>Next Generation Launch System Investment</i>	-	224.421	82.188	23.392	0.000	23.392	7.289	2.828	4.325	4.411	0.000	348.854
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

Note
 Prior Years Funding \$2,089.431M was executed in PE 1206853F.

A. Mission Description and Budget Item Justification

The National Security Space Launch (NSSL) program provides a space launch service that satisfies the government's National Launch Forecast (NLF) requirements to place National Security Space (NSS) space vehicles on orbit. NSSL is a launch service, not a weapon system, which is primarily funded with production funds.

NSSL Phase 2 development, started late FY 2014, funds research and development activities and related studies, to include, but not limited to, investments in new and/or upgraded launch systems and associated launch facilities to meet NSS launch needs leveraging domestic commercial launch providers. The RDT&E program will also fund continued research and development activities, mission manifest capability development & future studies for emerging NSS launch needs. These efforts will develop technologies for space access, mobility, and logistics (SAML) through multiple public-private partnerships; help sustain the U.S. industrial base; address emergent needs for launch-related space access and lower procurement costs by promoting competition. Examples include, but are not limited to, orbital transfer, on-orbit servicing, digital engineering, debris removal and novel on-orbit propulsion technologies.

The Space Force will continue investments in the Launch Service Agreement (LSA) public-private partnership with United Launch Alliance Vulcan Centaur for launch system development. Future development to capitalize on new technology and innovations developed by industry may continue to utilize public-private partnerships. The Space Force will also be leveraging opportunities to integrate Department of Defense payloads on to launch services procured commercially or by other Government agencies (e.g. NASA) where excess margin is available.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 1206392SF and 1206398SF. In PY \$1.235M was expended for civilian pay expenses in this program element, and in CY \$2.205M is forecasted for civilian pay expenses in this program element.

This program is in Budget Activity 5, System Development and Demonstration (SDD) because it has passed Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full rate production.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 1206853SF I National Security Space Launch Program (SPACE) - EMD
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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	232.648	82.188	23.351	0.000	23.351
Current President's Budget	224.421	82.188	23.392	0.000	23.392
Total Adjustments	-8.227	0.000	0.041	0.000	0.041
• 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	-8.227	0.000	0.041	0.000	0.041

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 650006: Next Generation Launch System Investment

Congressional Add: NSSL Payload Processing Facility

Congressional Add: Space Mobility and Logistics

Congressional Add Subtotals for Project: 650006

Congressional Add Totals for all Projects

	FY 2023	FY 2024
	77.189	0.000
	28.945	0.000
	106.134	0.000
	106.134	0.000

Change Summary Explanation

FY 2025: 0.041M HHQ adjustments

FY 2024: -0.541M to realign funding to APPN 3410, PE 1207804SF (SAG 13C), for fiscal policy compliance as Space Systems Command (SSC) establishes Headquarters functions and a Chief Information Office (CIO) for integrated cybersecurity. -0.173M CGR FFRDC

FY 2023: -1.455M CGR FFRDC. +110.000M Congressional Add. -\$8.227M SBIR reduction (-\$4.361M regular budget/- \$3.866M Congressional Add)

C. Accomplishments/Planned Programs (\$ in Millions)

Title:	FY 2023	FY 2024	FY 2025
Launch Service Agreement	118.287	82.188	23.392
Description: Invest in providers of domestic Launch Services. This investment enables the transition from the use of non-Allied space launch engines to commercial launch services that also meet NSS needs. Execute Other Transaction Authority (OTA)			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 1206853SF I National Security Space Launch Program (SPACE) - EMD
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>agreements to develop various industry solutions utilizing public-private partnerships. Continue the technical maturation and risk reduction activities in support of Launch Service OTAs.</p> <p>FY 2024 Plans: Continue the NSSL Phase 2 public-private partnership investment with United Launch Alliance (ULA) for the development of the Vulcan Centaur launch system. This investment includes continued development for the heavy lift (Category C) capability of the Vulcan Centaur, including Design Certification Review, and complete the West Coast space launch complex improvements. Additionally, FY 2024 funding will allow the program to rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities include, but are not limited to, program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p>FY 2025 Plans: Complete the NSSL Phase 2 public-private partnership investment with United Launch Alliance (ULA) for the development of the Vulcan Centaur launch system. This includes completion of the heavy lift (Category C) capability of the Vulcan Centaur and achieving Full Operation Capability (FOC) of the system. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: The decrease from FY 2024 to FY 2025 is due to the LSA OTA completing in FY25.</p>			
Accomplishments/Planned Programs Subtotals	118.287	82.188	23.392

	FY 2023	FY 2024
<p>Congressional Add: NSSL Payload Processing Facility</p> <p>FY 2023 Accomplishments: Development of payload processing capabilities to support National Security payload processing to support launches from the Eastern Range</p> <p>FY 2024 Plans: N/A</p>	77.189	0.000
<p>Congressional Add: Space Mobility and Logistics</p> <p>FY 2023 Accomplishments: Investments leverage near-term operational capabilities of commercial services and residual RDT&E capacity, which enhance the National Security Space mission area. Funding exploits commercial Space Maneuver and Servicing (SMS) systems already operationally employed and accelerates the development of maneuver and refueling capability in support of Dynamic Space Operations and other</p>	28.945	0.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206853SF / <i>National Security Space Launch Program (SPACE) - EMD</i>
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operational requirements. Examples include, but are not limited to, SMS capabilities, on-orbit deployment of enabling and transformational technologies, and in-space transportation. <i>FY 2024 Plans:</i> N/A	FY 2023	FY 2024
Congressional Adds Subtotals	106.134	0.000

D. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u> <u>Base</u>	<u>FY 2025</u> <u>OCO</u>	<u>FY 2025</u> <u>Total</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>FY 2029</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• SPSF 01 NSSL00: <i>National Security Space Launch</i>	1,024.803	2,142.846	1,843.757	-	1,843.757	1,743.743	1,913.542	2,034.434	2,156.689	2,388.330	15,248.144

Remarks

E. Acquisition Strategy

Launch Enterprise will continue execution of NSSL Phase 2 Public-Private Partnership investments and NSSL Enabling Investments, including those for Next Generation Rocket Engine Testing and Upper Stage Resiliency Enhancements. Phase 2 consists of RDT&E investment in commercial launch system prototypes developed via the Space Force's Launch Service Agreements (LSAs) and Rocket Propulsion System (RPS) Other Transaction Authority (OTA) agreements to ensure two domestic launch service providers are certified to meet all NSS requirements. Phase 2 ends the use of the Russian RD-180 engine and leverages the U.S. launch industry to meet more stressing national security needs. This strategy ensures space launch operations meet requirements for Assured Access to Space (AATS) codified in 10 USC 2273 and Congressional direction to end U.S. reliance on non-allied propulsion systems. FY 2023 funding used, in partnership with NRO, to enable additional payload processing capacity for future launches. AATS is continuing investment in Space Mobility and Logistics (SAML) with the support of FY 2023 Congressional funding. Development activities foster a robust launch industrial base and leverage launch innovation to maintain American leadership in launch capabilities.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206853SF / <i>National Security Space Launch Program (SPACE) - EMD</i>	Project (Number/Name) 650006 / <i>Next Generation Launch System Investment</i>
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
LSA OTA1	C/Various	United Launch Alliance : Denver, CO	-	86.542	Nov 2022	56.660	Nov 2023	1.560	Nov 2024	-		1.560	Continuing	Continuing	-
LNG/LOX Characterization Testing	Various	Various : Various	-	-		6.249	Dec 2023	-		-		-	Continuing	Continuing	-
Technical Mission Analysis	RO	Aerospace : El Segundo, CA	-	8.738	Dec 2022	2.730	Dec 2023	7.398	Dec 2024	-		7.398	Continuing	Continuing	-
Enterprise System Engineering and Integration (SE&I)	C/CPFF	Various : Various	-	7.844	Nov 2022	1.551	Nov 2023	5.724	Nov 2024	-		5.724	Continuing	Continuing	-
RDT&E SBIR/STTR	TBD	TBD : TBD	-	-		2.539	Mar 2024	0.529	Mar 2025	-		0.529	Continuing	Continuing	-
NSSL Payload Processing Facility	C/TBD	TBD : TBD	-	77.189	Sep 2023	-		-		-		-	Continuing	Continuing	-
Space Mobility and Logistics	C/Various	TBD : TBD	-	28.945	Apr 2023	-		-		-		-	Continuing	Continuing	-
Subtotal			-	209.258		69.729		15.211		-		15.211	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Organic Civilian Support	Reqn	DOD : El Segundo, CA	-	2.142	Oct 2022	2.206	Oct 2023	2.246	Oct 2024	-		2.246	Continuing	Continuing	-
Subtotal			-	2.142		2.206		2.246		-		2.246	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
FFRDC	RO	Aerospace : El Segundo, CA	-	0.954	Dec 2022	0.982	Dec 2023	1.012	Dec 2024	-		1.012	Continuing	Continuing	-

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206853SF / <i>National Security Space Launch Program (SPACE) - EMD</i>	Project (Number/Name) 650006 / <i>Next Generation Launch System Investment</i>

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Launch Service Agreement LSA	
United Launch Alliance (ULA) LSA OTA	
ULA LSA OTA Vulcan Certification Flights	
ULA LSA OTA West Coast Launch Pad Completion	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206853SF / <i>National Security Space Launch Program (SPACE) - EMD</i>	Project (Number/Name) 650006 / <i>Next Generation Launch System Investment</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Launch Service Agreement LSA				
United Launch Alliance (ULA) LSA OTA	1	2023	4	2025
ULA LSA OTA Vulcan Certification Flights	2	2024	2	2024
ULA LSA OTA West Coast Launch Pad Completion	3	2024	3	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 1203622SF / <i>Space Warfighting Analysis</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	0.000	3.568	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
646021: <i>Space Warfighting Analysis</i>	-	0.000	3.568	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
 In FY 2025, funds will transition from Program Element 1203622SF, Budget Activity 06 to Program Element 1203622SF, Budget Activity 04 to better align with USSF and SpOC Force Design funding under SWAC's RDT&E baseline.

A. Mission Description and Budget Item Justification
 This request funds increased scope towards capability area analyses and integration, modeling, wargaming, and experimentation to create operational concepts and force design guidance for existing and emerging USSF missions. These analyses efforts team with relevant stakeholders across the National Security Space enterprise from an independent perspective and will provide analytic insight to the Service to inform and/or validate solutions to operational needs and provide a basis for future capability development programs. USSF force design analyses are organized into three focus areas: Multi-Domain Sensing, Spectrum Warfare, and Force Design Integration which are aligned to USSF priorities, and follow a disciplined approach to discover, analyze, and validate concepts and the associated family of systems required to satisfy current/future mission needs while including comprehensive threat analysis. The resulting force design products will help define and inform future USSF mission requirements, capabilities/architectures, priorities and funding needs, and interface standards.

This program element includes necessary emergent/unanticipated civilian pay expenses required to manage and execute the force design mission assigned to the SWAC and/or deliver products for evolving weapon system capabilities.

This program is in Budget Activity 6, RDT&E Management Support because this budget activity includes research, development, test and evaluation efforts and funds to sustain and/or modernize the installations or operations required for general research, development, test and evaluation.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force				Date: March 2024		
Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 6: RDT&E Management Support</i>		R-1 Program Element (Number/Name) PE 1203622SF / <i>Space Warfighting Analysis</i>				
B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	
Previous President's Budget	0.000	3.568	4.970	0.000	4.970	
Current President's Budget	0.000	3.568	0.000	0.000	0.000	
Total Adjustments	0.000	0.000	-4.970	0.000	-4.970	
• 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	-4.970	0.000	-4.970	
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2023	FY 2024	FY 2025
Title: SWAC Government Workforce				0.000	3.568	0.000
Description: Provide professional government civilian acquisition workforce in support of the Space Warfighting Analysis Center. Activities may include, but are not limited to program office support, studies, technical analysis, prototyping, etc.						
FY 2024 Plans: Provides professional government civilian acquisition workforce in support of the Space Warfighting Analysis Center. Activities may include, but are not limited to program office support, studies, technical analysis, prototyping, etc.						
FY 2025 Plans: Provides professional government civilian acquisition workforce in support of the Space Warfighting Analysis Center. Activities may include, but are not limited to program office support, studies, technical analysis, prototyping, etc.						
FY 2024 to FY 2025 Increase/Decrease Statement: In FY25, funding decreased/zero'ed and transferred from Program Element 1203622SF, Budget Authority 06 to Program Element 1203622SF, Budget Authority 04 to better align with USSF and SpOC Force Design funding under SWAC's RDT&E baseline.						
Accomplishments/Planned Programs Subtotals				0.000	3.568	0.000
D. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force</i> / BA 6: <i>RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 1203622SF / <i>Space Warfighting Analysis</i>	

E. Acquisition Strategy

N/A

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 1205502SF / <i>Small Business Innovation Research</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	394.285	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
663005: <i>Small Business Innovation Research</i>	-	394.285	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) program implements 15 U.S.C Section 638 to maximize the creative, innovative, and entrepreneurial spirit of small businesses to solve technological problems.

AFWERX administers the DAF SBIR/STTR program with a vision to empower an innovation ecosystem that delivers disruptive Air & Space capabilities. AFWERX accelerates agile and affordable capability transitions by teaming innovation technology developers with Airmen and Guardian talent. In conjunction with the establishment of the United States Space Force (USSF), AFWERX stood up SpaceWERX to execute SBIR and STTR funds for the space portfolio. SpaceWERX's mission is to identify, acquire, and integrate innovation capabilities into the USSF while cultivating partnership among the nation's Space Guardians and top problem solvers. SpaceWERX will accomplish this mission through (i) connecting diverse, innovative industry, academia, and Government entities; (ii) creating capability options and prototype opportunities for the USSF; (iii) facilitating streamlined acquisition processes; and (iv) fostering a culture of innovation.

Additionally, this Program Element (PE) has a direct tie to and PE 0604009F (AFWERX) as this program improves DAF capabilities by connecting innovators, simplifying technology transfer, and accelerating results.

The DAF SBIR/STTR program implements three different approaches to provide funding and opportunities to small businesses. Open Topic: The Open Topic Program uses a technology-agnostic solicitation which encourages commercial industry to submit dual-use technology solutions without having a known end-user. It is used to capture the best capabilities and emerging technologies and allows industry to bring novel solutions to the DAF. Specific Topic: The Specific Topic Program seeks innovative solutions for SECAF identified Operational Imperatives and defined problem sets by a DAF end user or customer. Specific Topics have clearly-defined requirements and a known DAF customer built into the topic solicitation. STRATFI/TACFI: The STRATFI (Strategic Funding Increase) and TACFI (Tactical Funding Increase) Programs help to scale Phase II efforts to the level needed to achieve technology transitions. These programs de-risk development through syndication with multiple transition-focused partners and leveraging outside investment.

This program is in Budget Activity 6, RDT&E Management Support because this budget activity includes research, development, test and evaluation efforts and funds to sustain and/or modernize the installations or operations required for general research, development, test and evaluation.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 1205502SF / <i>Small Business Innovation Research</i>
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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	394.285	0.000	0.000	0.000	0.000
Total Adjustments	394.285	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	394.285	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Title: Small Business Innovation Research & Small Business Technology Transfer</p> <p>Description: The Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) program implements 15 U.S.C Section 638 to maximize the creative, innovative, and entrepreneurial spirit of small businesses to solve technological problems. AFWERX's mission is to accelerate agile and affordable capability transitions by teaming leaders in innovative technology with Airmen and Guardian talent.</p> <p>The DAF SBIR/STTR program implements three different approaches to provide funding and opportunities to small businesses:</p> <p>Open Topic: The Open Topic Program uses a technology-agnostic solicitation which encourages commercial industry to submit dual-use technology solutions without having a known end-user. It is used to capture the best capabilities and emerging technologies and allows industry to bring novel solutions to the DAF.</p> <p>Specific Topic: The Specific Topic Program seeks innovative solutions for SECAF identified Operational Imperatives and defined problem sets by a DAF end user or customer. Specific Topics have clearly-defined requirements and a known DAF customer built into the topic solicitation.</p> <p>STRATFI/TACFI: The STRATFI (Strategic Funding Increase) and TACFI (Tactical Funding Increase) Programs help to scale Phase II efforts to the level needed to achieve technology transitions. These programs de-risk development through syndication with multiple transition-focused partners and leveraging outside investment</p>	394.285	0.000	0.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 1205502SF / <i>Small Business Innovation Research</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>In FY 2022, SpaceWERX announced the Orbital Prime initiative under the SBIR/STTR Specific Topic program. Orbital Prime aligned a significant portion of the Specific Topic funding to the DAF's Operational Imperative #1, Space Order of Battle. Orbital Prime's objective is to seed the foundation for Assured Access to Space and Space Logistics/On-orbit servicing to enable a transition to a more resilient architecture to deliver services and maintain capabilities for all US & allied warfighters.</p> <p><i>FY 2024 Plans:</i> FY 2024 SBIR/STTR funds are intended to be allocated as follows: Specific Topic: 37% Open Topic: 37% SRATFI/TACFI: 20% Administrative: 6%</p> <p><i>FY 2025 Plans:</i> FY 2025 SBIR/STTR funds are intended to be allocated as follows: Specific Topic: 37% Open Topic: 37% SRATFI/TACFI: 20% Administrative: 6%</p>			
Accomplishments/Planned Programs Subtotals	394.285	0.000	0.000

D. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

E. Acquisition Strategy
Not Applicable

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 1206116SF / <i>Space Test and Training Range Development</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	18.726	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	18.726
666156: <i>Space Test and Training Range Development</i>	-	18.726	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	18.726
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

Supports the development of Space Test and Training Range (STTR) capabilities critical for developmental and operational test, training, exercises and tactics development for Space Control systems and Joint National Space Architecture. Includes development, demonstration and delivery of test assets, special test equipment, capabilities and systems required to test, validate, and verify performance of integrated space control systems. Provides a safe, secure, controllable and repeatable environment for the testing of space control mission systems and training operators in both realistic and relevant environments. Additionally, using an agile incremental development approach for range capabilities, this program develops test range assets for both the fixed node Space Range Operations Center (SROC) at Schriever Space Force Base and a deployable Signal Monitoring Unit capability to support complex Joint, AF and SF exercises. The virtual range as part of the Family of Systems (FoS), called Advanced Threat Simulation Environment (ATSE) virtual range, is being developed to accomplish the STTR mission. ATSE integrates to a Distributed Mission Architecture, tying into cyber, air, and space ranges for increased realism and complexity required to prepare space operators for real-world threats. This technology will allow for the first-ever use of a realistic signal environment to increase the realism and efficiency of space control squadron training. These risk reduction activities will include on-orbit capabilities, ground components, communication between nodes, and other required infrastructure.

The National Space Test and Training Complex (NSTTC) is the overarching complex designed to encompass all space test and training range capabilities. It includes two pillars, for Electronic Warfare (NSSTC-EW) and Cyber Warfare (NSSTC-C). STTRD provides capabilities for NSTTC-EW.

In FY 2024, Project 666156, Space Test and Training Range Development efforts were transferred to PE 1206759SF, Major T&E Investment - Space, Project 664598, Air Force Test Investments, to consolidate and provide transparency for overall National Space Test and Training Complex (NSTTC) efforts.

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

This program is in Budget Activity 6, RDT&E Management Support because this budget activity includes research, development, test and evaluation efforts and funds to sustain and/or modernize the installations or operations required for general research, development, test and evaluation.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 1206116SF / <i>Space Test and Training Range Development</i>
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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	21.328	0.000	0.000	0.000	0.000
Current President's Budget	18.726	0.000	0.000	0.000	0.000
Total Adjustments	-2.602	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	0.000	0.000			
• Other Adjustments	-2.602	0.000	0.000	0.000	0.000

Change Summary Explanation

FY 2023: -1.840M decrease for higher Space Force priorities.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
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Title: Range Control	14.698	0.000	0.000
Description: Continue development of virtual range integration with cyber and air ranges hosting network emulators and other environments allowing tactics, techniques, and procedures (TTP) development, realistic operational testing, and enable more realistic exercises integrating joint air, space and cyber effects. Continue overhaul of fixed range capabilities, replacement of obsolete equipment, outdated servers, and performing software upgrades focusing on updating signal monitoring hardware with visualization tools and new monitoring capabilities and cybersecurity automation. Implement system resiliency and situational awareness necessary to operate in the contested space domain. Acquire additional system capability to enable and enhance training against new and emerging adversarial assets, to integrate mission scenarios into one graphic user interface, to develop transportable range operations center to provide flexible range control capability for multiple sites, to reduce size, weight, and power, and to replace software defined radio cards. Integrate joint DoD solutions for counterspace and space superiority effects.			
FY 2024 Plans: N/A			
FY 2025 Plans: N/A			
FY 2024 to FY 2025 Increase/Decrease Statement:			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 1206116SF / <i>Space Test and Training Range Development</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
N/A			
Title: Management Services	4.028	0.000	0.000
Description: A&AS, FFRDC, and other Program Office Support			
FY 2024 Plans: N/A			
FY 2025 Plans: N/A			
FY 2024 to FY 2025 Increase/Decrease Statement: N/A			
Accomplishments/Planned Programs Subtotals	18.726	0.000	0.000

D. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

E. Acquisition Strategy
All contracts funded in this program element will be awarded using competitive procedures to the maximum extent possible.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 1206392SF / <i>ACQ Workforce - Space & Missile Systems</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	253.716	258.969	274.424	0.000	274.424	280.277	283.686	289.813	295.967	Continuing	Continuing
664280: <i>SMC Civilian Pay</i>	-	253.716	258.969	274.424	0.000	274.424	280.277	283.686	289.813	295.967	Continuing	Continuing

A. Mission Description and Budget Item Justification

Space Systems Command (SSC) equips US and allied forces with operational space and missile systems, launch systems, and command and control infrastructure in support of global military and national security operations. SSC operates with over 6,300 people and an annual budget exceeding 6.4B providing joint warfighters navigation, communication, weather, warning, force application, and space control capabilities.

SSC is authorized to employ approximately 1,897 civilian acquisition professionals providing the management, tools, and technical capabilities needed to oversee acquisition programs to include materiel solution analysis, technology development, engineering and manufacturing development, production and deployment, and operations and support. This funding does not include costs for base operating support civilian personnel supporting the Los Angeles Garrison at Los Angeles AFB. Funding SSC civilian payroll from the RDT&E appropriation provides program managers the flexibility to hire additional civilian personnel with program dollars versus additional contractors in concert with initiatives in response to the Defense Acquisition Workforce Improvement Act. This program element supports both civilian pay and non-pay support requirements.

In FY 2024 \$258.969M is forecasted to expend for civilian pay expenses in this program element.

Space acquisition must respond with speed and agility to emerging adversary threats. Space Systems Command (SSC) has transformed the organization and implementation of space acquisition to an enterprise approach, to increase 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, SSC will strategically execute experimentation, prototyping, risk reduction, and other efforts to develop new or repurpose existing capabilities.

This program is in Budget Activity 6, RDT&E Management Support because this budget activity includes research, development, test and evaluation efforts and funds to sustain and/or modernize the installations or operations required for general research, development, test and evaluation.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 1206392SF / <i>ACQ Workforce - Space & Missile Systems</i>
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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	253.716	258.969	265.259	0.000	265.259
Current President's Budget	253.716	258.969	274.424	0.000	274.424
Total Adjustments	0.000	0.000	9.165	0.000	9.165
• 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	9.165	0.000	9.165

Change Summary Explanation

FY 2025: increase of 9.165 Civ Pay reprice and manpower realignment.

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 6	R-1 Program Element (Number/Name) PE 1206392SF / ACQ Workforce - Space & Missile Systems	Project (Number/Name) 664280 / SMC Civilian Pay
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
664280: SMC Civilian Pay	-	253.716	258.969	274.424	0.000	274.424	280.277	283.686	289.813	295.967	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Space Systems Command (SSC) equips US and allied forces with operational space and missile systems, launch systems, and command and control infrastructure in support of global military and national security operations. SSC operates with over 6,300 people and an annual budget exceeding 6.4B providing joint warfighters navigation, communication, weather, warning, force application, and space control capabilities.

SSC is authorized to employ approximately 1,897 civilian acquisition professionals providing the management, tools, and technical capabilities needed to oversee acquisition programs to include materiel solution analysis, technology development, engineering and manufacturing development, production and deployment, and operations and support. This funding does not include costs for base operating support civilian personnel supporting the Los Angeles Garrison at Los Angeles AFB. Funding SSC civilian payroll from the RDT&E appropriation provides program managers the flexibility to hire additional civilian personnel with program dollars versus additional contractors in concert with initiatives in response to the Defense Acquisition Workforce Improvement Act. This program element supports both civilian pay and non-pay support requirements.

In FY 2024 258.969M was expended for civilian pay expenses in this program element; projection is sufficient due to FY23 carry-over.

FY 2025 projection is 274.424M. The projection is sufficient based on End-Strength, premium pay, performance, awards, and projected hires.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: SSC Acquisition Workforce	253.716	258.969	274.424
Description: Provide professional government civilian acquisition workforce in support of all Space Systems Command programs. Implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, prototyping, etc.			
FY 2024 Plans: Provide professional government civilian acquisition workforce in support of all Space Systems Command programs. Implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, prototyping, etc.			
FY 2025 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 6	R-1 Program Element (Number/Name) PE 1206392SF / ACQ Workforce - Space & Missile Systems	Project (Number/Name) 664280 / SMC Civilian Pay

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
Provide professional government civilian acquisition workforce in support of all Space Systems Command programs. Implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, prototyping, etc. FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increase compared to FY 2024 due to reprice and manpower realignment.			
Accomplishments/Planned Programs Subtotals	253.716	258.969	274.424

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 1206398SF / <i>Space & Missile Systems Center - MHA</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	13.962	13.694	12.867	0.000	12.867	13.134	13.410	13.692	13.979	Continuing	Continuing
664280: <i>SMC Civilian Pay</i>	-	13.962	13.694	12.867	0.000	12.867	13.134	13.410	13.692	13.979	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Space Systems Command (SSC) equips US and allied forces with operational space and missile systems, launch systems, and command and control infrastructure in support of global military and national security operations. SSC operates with over 6,300 people and an annual budget exceeding 6.4B providing joint warfighters navigation, communication, weather, warning, force application, and space control capabilities.

Program Element 1206398SF, Project: 664281 Space Systems Command - Major Headquarters Activities (MHA) was established to improve overall performance, strengthen business operations, and achieve efficiencies, effectiveness and cost savings that can be transferred to higher priority needs. PE adds approximately 83 acquisition professionals.

In FY 2024 \$13.962M is forecasted to expense for civilian pay expenses in this program element.

Space acquisition must respond with speed and agility to emerging adversary threats. SSC has transformed the organization and implementation of space acquisition to an enterprise approach, to increase 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, SSC will strategically execute experimentation, prototyping, risk reduction, and other efforts to develop new or repurpose existing capabilities.

This program is in Budget Activity 6, RDT&E Management Support because this budget activity includes research, development, test and evaluation efforts and funds to sustain and/or modernize the installations or operations required for general research, development, test and evaluation.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 1206398SF / <i>Space & Missile Systems Center - MHA</i>
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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	13.962	13.694	14.075	0.000	14.075
Current President's Budget	13.962	13.694	12.867	0.000	12.867
Total Adjustments	0.000	0.000	-1.208	0.000	-1.208
• 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	-1.208	0.000	-1.208

Change Summary Explanation

FY 2025: decrease of \$1.208M for Civ Pay reprice.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
Title: SSC - Major Headquarters Activities	13.962	13.694	12.867
Description: Provide professional government civilian acquisition workforce in support of all Space Systems Command Headquarters Activities. Implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to SSC Staff support, studies, technical analysis, prototyping, etc.			
FY 2024 Plans: Provide professional government civilian acquisition workforce in support of all Space Systems Command Management Headquarters Activities.			
FY 2025 Plans: Provide professional government civilian acquisition workforce in support of all Space Systems Command Management Headquarters Activities.			
FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decrease compared to FY 2024 due to civ pay reprice.			
Accomplishments/Planned Programs Subtotals	13.962	13.694	12.867

D. Other Program Funding Summary (\$ in Millions)

N/A

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force</i> / BA 6: <i>RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 1206398SF / <i>Space & Missile Systems Center - MHA</i>
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D. Other Program Funding Summary (\$ in Millions)

Remarks

E. Acquisition Strategy

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force / BA 6:</i> <i>RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 1206601SF / <i>Space Technology</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	0.000	91.778	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	91.778
C6601Z: <i>Civilian Pay Adjustment</i>	-	0.000	91.778	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	91.778
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This Budget Line Item incurred multiple database errors, a corrective technical adjustment has been submitted as part of the FY 2024 PB.

This Budget Line was assigned an incorrect Project code that aligned it in Budget Activity (BA) 06 (RDT&E Management Support). The correct Program Element (PE) is 1206601SF, Space Technology, BA 02 (Applied Research) and will be transferred in the next cycle.

An additional database error resulted in the improper realignment of funding from 1206392SF, ACQ Workforce - Space & Missile Systems, BA 06 / 1206398SF, Space & Missile Systems Center - MHA, BA 06 and will be transferred in the next cycle.

This is not a new start. While a new BA 06 (RDT&E Management Support) Project was created in FY 2024 due to the incorrect Project code assignment, this effort does not contain new work.

This program is in Budget Activity 6, RDT&E Management Support because this budget activity includes research, development, test and evaluation efforts and funds to sustain and/or modernize the installations or operations required for general research, development, test and evaluation.

<u>B. Program Change Summary (\$ in Millions)</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025 Base</u>	<u>FY 2025 OCO</u>	<u>FY 2025 Total</u>
Previous President's Budget	0.000	91.778	94.341	0.000	94.341
Current President's Budget	0.000	91.778	0.000	0.000	0.000
Total Adjustments	0.000	0.000	-94.341	0.000	-94.341
• 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	-94.341	0.000	-94.341

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force</i> / BA 6: <i>RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 1206601SF / <i>Space Technology</i>
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Change Summary Explanation

FY24 Database Error of \$91.778M:

- +72.888M - Database Error, realignment from BA02 1206601SF
- +17.531M - Database Error, realignment from BA06 1206392SF
- +1.359M - Database Error, realignment from BA06 1206398SF
- =91.778M - Final

FY 2025 decreased by \$94.341M from FY 2024 due to a database correction allocating funding to the appropriate budget program activity codes.

C. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Civilian Pay Adjustment	0.000	91.778	0.000
Description: This Budget Line Item incurred multiple database errors, and follow-up technical adjustments will be requested. This Budget Line was assigned an incorrect Project code that aligned it in Budget Activity (BA) 06 (RDT&E Management Support). The correct Program Element (PE) is 1206601SF, Space Technology, BA 02 (Applied Research) and will be transferred in the next cycle. An additional database error resulted in the improper realignment of funding from 1206392SF, ACQ Workforce - Space & Missile Systems, BA 06 / 1206398SF, Space & Missile Systems Center - MHA, BA 06 and will be transferred in the next cycle.			
FY 2024 Plans: This Budget Line Item incurred multiple database errors, a corrective technical adjustment has been submitted. This Budget Line was assigned an incorrect Project code that aligned it in Budget Activity (BA) 06 (RDT&E Management Support). The correct Program Element (PE) is 1206601SF, Space Technology, BA 02 (Applied Research) and will be transferred in the next cycle. An additional database error resulted in the improper realignment of funding from 1206392SF, ACQ Workforce - Space & Missile Systems, BA 06 / 1206398SF, Space & Missile Systems Center - MHA, BA 06 and will be transferred in the next cycle.			
FY 2025 Plans: N/A			
FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased compared to FY 2024 due to a database correction, allocating funding to the appropriate budget program activity codes.			
Accomplishments/Planned Programs Subtotals	0.000	91.778	0.000

D. Other Program Funding Summary (\$ in Millions)

N/A

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force</i> / BA 6: <i>RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 1206601SF / <i>Space Technology</i>
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D. Other Program Funding Summary (\$ in Millions)

Remarks

E. Acquisition Strategy

N/A

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 1206759SF / <i>Major T&E Investment - Space</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	167.901	146.797	229.665	0.000	229.665	217.859	219.531	218.510	227.824	0.000	1,428.087
660191: <i>660191 - Space Systems Operational Test & Eval</i>	-	1.512	9.565	27.051	0.000	27.051	28.713	29.790	29.866	30.490	0.000	156.987
664597: <i>664597 - Professional Test Workforce</i>	-	166.389	115.405	5.912	0.000	5.912	6.275	6.511	6.527	6.663	0.000	313.682
664598: <i>664598 - National Space Test and Training Complex (NSTTC)</i>	-	0.000	21.827	196.702	0.000	196.702	182.871	183.230	182.117	190.671	0.000	957.418

Note
 BPAC 660191 Title renamed to Space Systems Operational Test & Eval
 BPAC 664597 Title renamed to Professional Test Workforce
 BPAC 664598 Title renamed to National Space Test and Training Complex (NSTTC)

A. Mission Description and Budget Item Justification

This program provides funds for the United States Space Force (USSF) Test Enterprise. Funds support enterprise-level, threat-relevant, and fully-integrated developmental and operational Space Test & Evaluation (T&E) activities and capabilities; the development of a professional space T&E workforce; and the organization, acquisitions, and operations of the National Space Test and Training Complex (NSTTC).

Space T&E activities and capabilities include the USSF Integrated Test Force (ITF) structures, USSF Operational Test Agency (OTA) test execution campaigns, and the workforce and activities required to conduct T&E to adequately assess the performance and survivability of Department of Defense (DoD) space systems, tactics, and technologies in contested environments.

Workforce development refers to the organizations, training, and activities required to develop a professional space T&E workforce including the development and operation of the Space Test Course at the United States Air Force (USAF) Test Pilot School (TPS).

Space T&E infrastructure encompasses the organization, acquisitions, operations, and associated activities as part of the NSTTC to develop, integrate, operate, and sustain the minimum technical capabilities required to test and evaluate the performance and survivability of critical DoD space systems in contested environments. The NSTTC delivers realistic test and training environments to support capability development by incorporating a mix of live and virtual capabilities to conduct threat emulation, advanced training, tactics development, and integrated testing.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 1206759SF / <i>Major T&E Investment - Space</i>
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This program is in Budget Activity 6, RDT&E Management Support because this budget activity includes research, development, test and evaluation efforts and funds to sustain and/or modernize the installations or operations required for general research, development, test and evaluation.

B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	173.974	146.797	167.087	0.000	167.087
Current President's Budget	167.901	146.797	229.665	0.000	229.665
Total Adjustments	-6.073	0.000	62.578	0.000	62.578
• 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	0.331	0.000			
• SBIR/STTR Transfer	-6.404	0.000			
• Other Adjustments	0.000	0.000	62.578	0.000	62.578

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 664597: *664597 - Professional Test Workforce*

Congressional Add: *Lab and test range upgrades for space*

Congressional Add: *Operational test and training infrastructure - Cyber Test/Evaluation and Aggressor Force Capabilities*

Congressional Add: *Operational test and training infrastructure - Ground-based radar in support of NSTTC*

Congressional Add Subtotals for Project: 664597

Congressional Add Totals for all Projects

	FY 2023	FY 2024
	-	0.000
	48.367	-
	34.204	-
	82.571	0.000
	82.571	0.000

Change Summary Explanation

FY 2025 increase is due to funding needed for range command and control leading to the first step in realizing the Global Range Operations concept; new architecture to include ground-based optical sensors and network terminals required to enable classified mission planning and data sharing with specific customers of the Orbital Space Range; Cyber range and Aggressor investments necessary for equipping the Aggressors, defending the global range, replication of mission systems and range sustainment and the test expertise needed to support an additional 18 test programs.

FY25: +28.880M funds threat informed, operationally representative training environments and HWIL (Hardware-in-the-loop) lab to conduct cyber T&E and cyber test training.

FY25: +25.480M funds the NSTTC capability growth for Electronic Warfare (EW) and Orbital Warfare (OW) ranges.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force</i> / BA 6: <i>RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 1206759SF / <i>Major T&E Investment - Space</i>	
FY25: +7.800M funds Orbital Warfare (OW) Integrated Test Force. FY25: +.418M inflation increase.		

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 6					R-1 Program Element (Number/Name) PE 1206759SF / Major T&E Investment - Space				Project (Number/Name) 660191 / 660191 - Space Systems Operational Test & Eval			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
660191: 660191 - Space Systems Operational Test & Eval	-	1.512	9.565	27.051	0.000	27.051	28.713	29.790	29.866	30.490	0.000	156.987
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Space Operational Test and Evaluation refers to Congressionally mandated Space Initial Operational Test and Evaluation (IOT&E) to support major weapon system acquisition decisions beyond Low-Rate Initial Production (LRIP), Milestone C, full rate production, fielding, and declaration of Initial Operational Capability (IOC). For Major Defense Acquisition Programs (MDAP), the law requires IOT&E be completed under realistic operating conditions before proceeding beyond LRIP. IOT&E will be planned to answer all critical operational issues (COI) as thoroughly as possible. IOT&E is conducted to determine the operational effectiveness and suitability and resolve overall mission capability of systems undergoing research and development (R&D) efforts. It is an evaluation of a system's performance when the complete system is tested and evaluated against operational criteria by personnel with the same qualifications as those who will operate, maintain and support the system when deployed. In general, IOT&E is performed on new systems in development, major modifications, and other systems as directed.

This funds the USSF Operational Test Agency's participation in Integrated Test and Evaluation (IT&E). Additionally, it funds the Multiservice Operational Test and Evaluation (MOT&E) and Follow-on Operational Test and Evaluation (FOT&E) when it is the continuation of IOT&E activities past the full rate production decision. FOT&E answers specific questions about unresolved COIs and test issues or completes areas not finished during the IOT&E. This effort also funds related operational test and evaluation (OT&E) activities such as Early Influence, Operational Utility Evaluations (OUE), Early Operational Assessments (EOA), and Operational Assessments (OA) which are independent OT&Es supporting major milestones and decision points, full rate production, fielding, or declaration of IOC for USSF programs. USSF schedules and executes tests according to the forecasted test readiness of the MDAP program offices.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Space Systems Operational Test and Evaluation (OT&E)	1.512	9.565	27.051
Description: Plan, execute and report OT&E for Space Systems			
FY 2024 Plans:			
Continue FY23 activities namely:			
- Advanced Extremely High Frequency Satellite Communications (Advanced EHF): Conduct FOT&E			
- Evolved Strategic SATCOM (ESS): Conduct early influence			
- Military GPS User Equipment (GPS MGUE): Conduct IOT&E			
- GPS Next Generation Control Segment (GPS OCX): Conduct MOT&E			
- Long-Range Discrimination Radar (LRDR): Conduct FOT&E			
- Next-Generation Overhead Persistent Infrared (Next-Gen OPIR): Conduct OUE			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 6	R-1 Program Element (Number/Name) PE 1206759SF / Major T&E Investment - S pace	Project (Number/Name) 660191 / 660191 - Space Systems Operational Test & Eval

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<ul style="list-style-type: none"> - Protected Tactical Enterprise Service (PTES): Complete MOT&E - Protected Tactical SATCOM (PTS): Conduct OUE - Space Based Infrared System (SBIRS): Conduct OUE - SBIRS Survivable Endurable Evolution (S2E2): Conduct IOT&E - Space C2 (formerly JMS): Complete FOT&E - Tranche 1 Transport Layer (and accompanying Tranche 1 Tracking Layer): Conduct IOT&E - Conduct other planning and operational testing for new space system programs as the requirement becomes known to USSF. <p>FY 2025 Plans: Continue FY24 activities namely:</p> <ul style="list-style-type: none"> - Advanced Tracking Launch Analysis System: Conduct IOT&E - AN/FPS-132 UEWR Beam Steering Unit: Conduct IOT&E - Enhanced Polar System - Recapitalization: Conduct IOT&E - Evolved Strategic SATCOM (ESS): Conduct early influence - Family of Beyond Line-of-Site Terminals (FAB-T): Conduct IOT&E, threat testing; followed by FOT&E - Force Element Terminal: Conduct early influence - Future Operational Resilient Ground Evolution - Conduct MTA - Geosynchronous Space Surveillance Awareness Program 7/8: Conduct FOT&E - GPS IIIIF - Conduct early influence - Iris: Conduct IOT&E - Military GPS User Equipment (GPS MGUE): Conduct IOT&E - Mobile AEHF Terminal: Conduct early influence - Missile Defense System - Conduct MOT&E - GPS Next Generation Control Segment (GPS OCX): Conduct MOT&E - Proliferated Warfighter Satellite Architecture: Conduct IOT&E - Long-Range Discrimination Radar (LRDR): Conduct FOT&E - Next-Generation Overhead Persistent Infrared (Next-Gen OPIR): Conduct OUE - Presidential and National Voice Conferencing: Conduct MOT&E - Protected Tactical SATCOM - Conduct MTA - Space Based Infrared System (SBIRS): Conduct OUE - SBIRS Survivable Endurable Evolution (S2E2): Conduct FDE - SureFire: Conduct IOT&E - Weather Satellite Follow-on Microwave - Conduct early influence 			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F / 6	R-1 Program Element (Number/Name) PE 1206759SF / Major T&E Investment - S pace	Project (Number/Name) 660191 / 660191 - Space Systems Operational Test & Eval		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
- Conduct other planning and operational testing for new space system programs as the requirement becomes known to USSF.				
FY 2024 to FY 2025 Increase/Decrease Statement: Increase is due to funding realignment from project 664597 by 17.486M. Realignment aligns funding with prior execution year internal spend plans. This realignment did not result in any discontinuation of effort and is not a New Start. Funding levels deliver increased expertise and infrastructure required to support the evaluation of new programs on the OSD Oversight list.				
Accomplishments/Planned Programs Subtotals		1.512	9.565	27.051
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
N/A				

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 6	R-1 Program Element (Number/Name) PE 1206759SF / Major T&E Investment - Space	Project (Number/Name) 664597 / 664597 - Professional Test Workforce
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
664597: 664597 - Professional Test Workforce	-	166.389	115.405	5.912	0.000	5.912	6.275	6.511	6.527	6.663	0.000	313.682
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

Note

This project has been re-characterized as a standalone test workforce project for funding traceability purposes. Project Title was renamed from Space Force Test Investments to Professional Test Workforce.

A. Mission Description and Budget Item Justification

This project provides funding for the organizations, training, and activities required to develop a professional space T&E workforce, in conjunction with the USSF Chief Human Capital Officer. Funding primarily supports the development of the Space Test Course as the USAF Test Pilot School. The STC at USAF TPS will provide graduate-level education for the core space T&E workforce.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Professional Test Workforce	83.818	115.405	5.912
Description: Manage the professional test workforce in conjunction with the USSF Chief Human Capital Officer, including the T&E training opportunities necessary to develop our professional test workforce.			
FY 2024 Plans: - Continue to develop and conduct the STC at the USAF TPS. Prepare transition of STC to a 1-year curriculum.			
FY 2025 Plans: - In conjunction with USAF Test Pilot School, continue to develop a year-long, degree granting, professional space test course to produce guardians with the necessary expertise in robust survivability testing, procedure validation, full-envelope characterization, and system performance validation.			
FY 2024 to FY 2025 Increase/Decrease Statement: FY 2024 decreased compared to FY 2025 by 109.493M due to realignment to project 664598. Realignment aligns with prior execution year internal spend plans. This realignment did not result in any discontinuation of effort and is not a New Start.			
Accomplishments/Planned Programs Subtotals	83.818	115.405	5.912

	FY 2023	FY 2024
Congressional Add: Lab and test range upgrades for space	-	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F / 6	R-1 Program Element (Number/Name) PE 1206759SF / Major T&E Investment - S pace	Project (Number/Name) 664597 / 664597 - Professional Test Workforce
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	FY 2023	FY 2024
FY 2024 Plans: Increased investment in digital architecture and expertise needed to replicate adversary threat systems and provide high-fidelity test and training environments.		
Congressional Add: Operational test and training infrastructure - Cyber Test/Evaluation and Aggressor Force Capabilities	48.367	-
FY 2023 Accomplishments: Funds will be used to build cyber range and lab capability for T&E of space systems, defensive cyber tools, cyber aggressors, and cyber test training in secure environments. The cyber range(s) will be built as operationally representative environments to conduct T&E and training and can include blue and red models		
Congressional Add: Operational test and training infrastructure - Ground-based radar in support of NSTTC	34.204	-
FY 2023 Accomplishments: Funds will be leveraged to upgrade the existing backend of the Ground Based Radar-Kwajalein as well as invest in long lead parts to replace the Radome so that the Ground Based Radar-Kwajalein can become an effective NSTTC Range Asset.		
Congressional Adds Subtotals	82.571	0.000

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

Formerly titled Space Force Test Investments

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 6	R-1 Program Element (Number/Name) PE 1206759SF / Major T&E Investment - S pace	Project (Number/Name) 664598 / 664598 - National Space Test and Training Complex (NSTTC)
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
664598: 664598 - National Space Test and Training Complex (NSTTC)	-	0.000	21.827	196.702	0.000	196.702	182.871	183.230	182.117	190.671	0.000	957.418
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This project has been re-characterized as a standalone NSTTC project for funding traceability purposes and consolidation of all NSTTC investments. Project Title was renamed from NSTTC-E to NSTTC.

A. Mission Description and Budget Item Justification

Provide space warfighters interconnected, scalable, and distributed physical and digital ranges for full-spectrum test and training to develop, validate, and sharpen joint warfighting solutions to prevail in conflict.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: NSTTC	0.000	21.827	196.702
<p>Description: Supports the development of National Space Test and Training Complex test environments that are critical for developmental and operational test, training, exercises and tactics development for space systems. Includes development, demonstration and delivery of test assets, special test equipment, capabilities and systems required to test, validate, and verify performance of integrated space systems. Provides a safe, secure, controllable and repeatable environment for the testing of space systems and training operators in both realistic and relevant electromagnetic environments.</p> <p>NSTTC-C (Cyber Range)-Provides live and simulated cyber operations and security test and training. NSTTC-C will be a center of excellence for verification, validation, and accreditation (VV&A) USSF systems for cyber resiliency, security, and interoperability.</p> <p>NSTTC-D (Digital)-Provides hybrid digital environments, infrastructure based digital connectivity, and cradle-to-grave Modeling & Simulation (M&S) to enable system concept studies, development, test, training, exercises, and wargaming.</p> <p>NSTTC-E (Electromagnetic Range)-Provides ground infrastructure and on-orbit subjects for Electronic Warfare (EW), Satellite Communications (SATCOM), and Positioning Navigation and Timing (PNT) test and training.</p> <p>NSTTC-O (Orbital Range)-Provides sensor and data fusion to enable live, on-orbit Orbital Warfare (OW) test and training. On-orbit infrastructure supports execution of exquisite, discrete demonstrations.</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 6	R-1 Program Element (Number/Name) PE 1206759SF / Major T&E Investment - S pace	Project (Number/Name) 664598 / 664598 - National Space Test and Training Complex (NSTTC)

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p><i>FY 2024 Plans:</i></p> <ul style="list-style-type: none"> - Invest in architecture to integrate unit and theater-level Space Electromagnetic Spectrum and orbital support for training, exercise, and mission rehearsal across the operational domains - Invest in dedicated cyber training, equipment, expertise and systems needed to defend the NSTTC, replicate mission systems, and equip Cyber Aggressors - Continue development of test and evaluation electronic spectrum environment command and control. - Continue support to warfighting community of electronic warfare advanced training environment. - Develop integrated data transport architecture with NSTTC. <p><i>FY 2025 Plans:</i></p> <ul style="list-style-type: none"> - Continue investments in NSTTC On-Orbit, Digital, Cyber, and Electromagnetic pillars including development of foundational infrastructure as well as modernization and improvement (I&M) of existing capabilities to keep current with military priorities, evolving threats, and advanced training involving USSF and joint systems and operations - Continue development of Electromagnetic Spectrum range C3, terminal, data generation systems - Continue support to warfighting community of electronic warfare advanced training environment - Continue development of integrated data transport architecture with NSTTC <p><i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> Increase from FY 2024 to FY 2025 supports funding for cyber range and aggressors for operational threat environments, the National Space Test and Training Complex (NSTTC) capability growth for Electronic Warfare (EW) and Orbital Warfare (OW) ranges, and to fund OW integrated test force. Increase also due to realignment from a project 664597 by 109.493M in order to consolidate all NSTTC funding into one standalone project for traceability purposes. Realignment aligns with prior execution year internal spend plans. This realignment did not result in any discontinuation of effort and is not a New Start.</p>			
Accomplishments/Planned Programs Subtotals	0.000	21.827	196.702

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 1206860SF / <i>Rocket Systems Launch Program (SPACE)</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	33.643	18.023	20.134	0.000	20.134	20.123	20.538	21.279	21.699	Continuing	Continuing
661023: <i>Rocket System Launch Program (RSLP)</i>	-	33.643	18.023	20.134	0.000	20.134	20.123	20.538	21.279	21.699	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Rocket Systems Launch Program (RSLP) provides responsive space and Research, Development, Test and Evaluation (RDT&E) launch vehicle support to DoD and other government agencies using commercial launch systems and excess ballistic missile assets. The RSLP mission was established by the Secretary of Defense in 1972. The small launch program complements the National Security Space Launch (NSSL) program with multiple options to acquire dedicated spacelift and rideshare services for developmental, demonstration, and small operational space vehicles. It provides mission planning, payload integration, vehicle acquisition, processing, launch operations, booster storage and disposition, aging surveillance, maintenance and logistics support for selected DoD responsive space and RDT&E launches. Costs directly attributable to a specific launch or program (e.g., reliability of flight testing, maintenance of launch vehicle processing infrastructure) are paid by non-Space Force users (Navy, Army, Missile Defense Agency (MDA), Defense Advanced Research Project Agency (DARPA), National Reconnaissance Office (NRO), etc.). RSLP maintains exclusive control of decommissioned Minuteman and Peacekeeper assets used in testing to include refurbishment, transportation and handling, storage, aging surveillance, and launch services. RSLP also funds general research, development, prototyping, integration, and supplemental reliability of flight testing efforts for launch to enhance the reliability of a variety of launch vehicles using RSLP motors for suborbital and orbital missions (e.g., updates to the Modular Mechanical Ordnance Destruct System).

While the corresponding RSLP Procurement, Space Force line is set to 0 due to no planned procurements of Space Force funded missions, the activities funded by this RDT&E line are still required to safely store and maintain the RSLP inventory of launch assets.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 1206392SF and 1206398SF. In PY 0.0M was expended for civilian pay expenses in this program element, and in CY 0.180M is forecasted for civilian pay expenses in this program element.

This program is in Budget Activity 6, RDT&E Management Support because this budget activity includes research, development, test and evaluation efforts and funds to sustain and/or modernize the installations or operations required for general research, development, test and evaluation.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 1206860SF / <i>Rocket Systems Launch Program (SPACE)</i>
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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	34.872	18.023	20.099	0.000	20.099
Current President's Budget	33.643	18.023	20.134	0.000	20.134
Total Adjustments	-1.229	0.000	0.035	0.000	0.035
• Congressional General Reductions	-0.050	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	-1.179	0.000			
• Other Adjustments	0.000	0.000	0.035	0.000	0.035

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 661023: *Rocket System Launch Program (RSLP)*

Congressional Add: *State Launched Range Services*

Congressional Add Subtotals for Project: 661023

Congressional Add Totals for all Projects

	FY 2023	FY 2024
	17.000	-
	17.000	-
	17.000	-

C. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Storage/Refurbishment/Flight Readiness/Demil	13.701	14.930	16.470
Description: Storage, refurbishment, inventory control, and demil/disposal of decommissioned Minuteman, Peacekeeper and other missile flight test assets			
FY 2024 Plans: Continue storage, refurbishment, inventory control, and demil/disposal of decommissioned Minuteman, Peacekeeper and other missile flight test assets and perform research and development support operations as required. Investigate and develop shipping throughput capacity to maximize opportunity for motor disposal. Continue support activities to include but not limited to sustainment replacement and refurbishment of support equipment, mission support, special studies etc.			
FY 2025 Plans: Continue storage, refurbishment, inventory control, and demil/disposal of decommissioned Minuteman, Peacekeeper and other missile flight test assets and perform research and development support operations as required. Investigate and develop			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 6: RDT&E Management Support</i>		R-1 Program Element (Number/Name) PE 1206860SF / <i>Rocket Systems Launch Program (SPACE)</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
shipping throughput capacity to maximize opportunity for motor disposal. Continue support activities to include but not limited to sustainment replacement and refurbishment of support equipment, mission support, special studies etc.				
FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased compared to FY 2024 due to an adjustment for inflation increased labor/material costs and to support demil of the least useful RSLP Motors.				
Title: Aging Surveillance		2.142	2.193	2.700
Description: Perform aging surveillance-related activities on stored motors				
FY 2024 Plans: Continue performing aging surveillance-related activities on stored motors; continue performing analysis/studies to identify and evaluate potential safety-related issues affecting stored motors; continue program office support and related support activities such as, but not limited to mission support, special studies, etc.				
FY 2025 Plans: Continue performing aging surveillance-related activities on stored motors; continue performing analysis/studies to identify and evaluate potential safety-related issues affecting stored motors; continue program office support and related support activities such as, but not limited to mission support, special studies, etc.				
FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased compared to FY 2024 due to an adjustment for inflation increased labor/material costs.				
Title: Other Launch Support Services		0.800	0.900	0.964
Description: Perform Launch Services Activities				
FY 2024 Plans: Continue launch vehicle acquisition, processing, launch services support including responsive launch, mission assurance, reliability of flight and operations to launch RDT&E payloads.				
Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, prototyping, etc.				
FY 2025 Plans: Continue launch vehicle acquisition, processing, launch services support including responsive launch, mission assurance, reliability of flight and operations to launch RDT&E payloads.				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 1206860SF / <i>Rocket Systems Launch Program (SPACE)</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.			
<i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> FY 2025 increased compared to FY 2024 due to an adjustment for inflation increased labor/material costs.			
Accomplishments/Planned Programs Subtotals	16.643	18.023	20.134

	FY 2023	FY 2024
<i>Congressional Add:</i> State Launched Range Services	17.000	-
<i>FY 2023 Accomplishments:</i> Improved spaceports that are commercially licensed by the Federal Aviation Administration and receive funding from the local or State government. Enhanced capacity to provide mid-to-low inclination orbits and polar-to-high inclination orbits in support of national security space programs.		
Congressional Adds Subtotals	17.000	-

D. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

E. Acquisition Strategy

N/A

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 6:</i> <i>RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 1206862SF / <i>Tactically Responsive Space</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	48.243	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	48.243
664235: <i>Tactically Responsive Launch</i>	-	48.243	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	48.243
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Tactically Responsive Space will fund proof-of concept tactically responsive space demonstrations including launch, satellites, control systems, and concept of operations using emerging and extant commercial launch and satellite providers with the goal to place or replace military capability on orbit within 24 hours.

In FY 2024, Tactically Responsive Launch efforts were transferred to PE 1206862SF, Tactically Responsive Space, Project 643835, Tactically Responsive Space (TacRS), in Budget Activity 04, in order to encompass the full range of responsive space.

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

This program is in Budget Activity 6, RDT&E Management Support because this budget activity includes research, development, test and evaluation efforts and funds to sustain and/or modernize the installations or operations required for general research, development, test and evaluation.

B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	50.000	0.000	0.000	0.000	0.000
Current President's Budget	48.243	0.000	0.000	0.000	0.000
Total Adjustments	-1.757	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	-1.757	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 1206862SF / <i>Tactically Responsive Space</i>
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Congressional Add Details (\$ in Millions, and Includes General Reductions)	FY 2023	FY 2024
Project: 664235: <i>Tactically Responsive Launch</i>		
Congressional Add: <i>Tactically Responsive Space</i>	-	0.000
Congressional Add: <i>Tactically Responsive Space Additional Demo</i>	48.243	-
Congressional Add Subtotals for Project: 664235		
	48.243	0.000
Congressional Add Totals for all Projects		
	48.243	0.000

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024
Congressional Add: <i>Tactically Responsive Space</i>	-	0.000
FY 2024 Plans: N/A		
Congressional Add: <i>Tactically Responsive Space Additional Demo</i>	48.243	-
FY 2023 Accomplishments: Demonstrates proof-of-concept tactically responsive space capabilities, including satellites, launch vehicles, control systems, and concept of operations using emerging and extant launch providers. Activities included concept design, studies of commercial capabilities and operations, technical analysis, launch service acquisition, prototyping, rideshare service acquisition, processing, launch services support, mission assurance, operations; and tactics, techniques, and procedures, program office support, etc. for demonstration of responsive space and launch.		
Congressional Adds Subtotals	48.243	0.000

D. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

E. Acquisition Strategy

The Space Force is utilizing new and existing open competitive launch service, space vehicle, and ground contracts, Small Business Innovative Research contracts, Other Transaction Authority (OTA) Agreements, and other contract vehicles to take advantage of evolving commercial capabilities for tactically responsive space.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 6:</i> <i>RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 1206864SF / <i>Space Test Program (STP)</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	27.104	30.192	30.279	0.000	30.279	29.833	30.447	31.545	32.167	Continuing	Continuing
662617: <i>C6601Z</i>	-	27.104	30.192	30.279	0.000	30.279	29.833	30.447	31.545	32.167	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Space Test Program (STP) executes the annual DoD Space Experiments Review Board (SERB) process and consolidates requirements from the space Science and Technology (S&T) community in order to optimize space system missions and achieve maximum benefit of available resources. STP designs and executes missions to maximize launch mass to orbit, combines multiple flight experiments on suitable spacecraft, multiple spacecraft on available launch vehicles, and facilitates launch packages for government, commercial, and international partnerships. STP provides a cost-effective way to evaluate militarily relevant space flight experiments that:

- Demonstrate on-orbit performance of new technologies to increase technology readiness level and validate research hypotheses for the S&T community
- Develop and mature future operational capabilities
- Advance operational tactics, techniques and procedures (TTPs) for future space and test capabilities
- Enable on-orbit experiments to support S&T
- Leverage national (e.g. DoD, commercial, and NASA) and international launch opportunities to increase space access for S&T efforts

STP supports Space Force efforts to define future system architectures that address emerging threats, enable resilient space capabilities, and employ tactical space operations to ensure freedom of operations in the space domain.

STP adheres to Executive Orders 10521 and 13185, and the requirement from the Office of the Under Secretary of Defense for Research and Engineering (OUSD (R&E)) to support research, per DoD Instruction 3210.1, Administration and Support of Basic Research. In addition, the Deputy Secretary of Defense Space Test Program Management & Funding Policy, issued in July 2002, reaffirmed STP as the primary provider of spaceflight for the DoD space research community. The July 2002 policy statement also reaffirmed STP's role as the single manager for all DoD payloads on the International Space Station (ISS).

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

This program is in Budget Activity 6, RDT&E Management Support because this budget activity includes research, development, test and evaluation efforts and funds to sustain and/or modernize the installations or operations required for general research, development, test and evaluation.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 6: RDT&E Management Support	R-1 Program Element (Number/Name) PE 1206864SF / Space Test Program (STP)
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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	25.291	30.192	30.226	0.000	30.226
Current President's Budget	27.104	30.192	30.279	0.000	30.279
Total Adjustments	1.813	0.000	0.053	0.000	0.053
• 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	1.813	0.000	0.053	0.000	0.053

Change Summary Explanation

FY 2025: Decrease of \$0.008M due to realignment to higher priority.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
Title: Payload Integration	19.271	21.028	16.060
Description: Integrate payloads onto spaceflight missions on the full spectrum of DoD on-orbit R&D (e.g. space vehicle, free-flyer payloads, hosted payloads, etc.). Includes acquisition of associated spacecraft and integration hardware.			
FY 2024 Plans: Continue STP-5 planning, integration and design activities (Strontium Iodide Radiation Instrumentation III (SIRI-III), PNTOC, and Rigel payloads). Continue STPSat-8 integration and design activities (STEP 2.0 (Space Test Experiments Platform)). Conduct payload integration of STP-H9, STP-H10, and STP-28AR1. Begin design for future ISS missions. Complete satellite acquisition and integration of STPSat-7 and its ground systems. Complete STP-H11 design activities and begin integration activities. Conduct STP-S29 technical analysis and payload integration rideshare. Initiate STP Small Launch STP-S30 (every 2 yrs) Mission Unique and Integration Costs. Collaborate on technical analysis and other future missions as required. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc.			
FY 2025 Plans: Continue STP-5 planning, integration and design activities (SIRI-III and Rigel payloads). Continue STPSat-8 integration and design activities (STEP 2.0 (Space Test Experiment Platform)). Conduct payload integration of STP-S29A, STPS29B, STP-H10, STPSat-7, and STP-AR1. Begin design for future ISS missions and continue planning for ISS transition to commercial. Complete satellite acquisition and integration of STPSat-7 and its ground systems. Complete STP-H11 design activities and			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 6: RDT&E Management Support</i>		R-1 Program Element (Number/Name) PE 1206864SF / <i>Space Test Program (STP)</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>begin integration activities. Conduct STP-H12 design and begin integration. Conduct STP-S30 technical analysis and payload integration rideshare. Initiate STP Small Launch STP-S31 (every 2 yrs) Mission Unique and Integration Costs. Collaborate on technical analysis and other future missions as required. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY2025 decreased due to acquisition delay of STPSat-8.</p>				
<p>Title: Launch Vehicle and Launch Services</p> <p>Description: Purchase launch services, launch vehicles, and launch vehicle support for the full spectrum of DoD on-orbit R&D (e.g. space vehicle, free-flyer payloads, hosted payloads, etc.), enabling spaceflight worthiness and "Do No Harm" certification for Space Systems Command (SSC) and US Space Force (USSF) HQ.</p> <p>FY 2024 Plans: Continue to Support spaceflight worthiness and "Do No Harm" Certification. Execute STP-S29A, S29B, STP S28B, S28C, and other small launch initiatives as required. Continue STP-5 medium launch initiative. Plan and complete technical analysis for commercial rideshare launch of DoD SERB experiments and International Space Access Review Board (ISARB)-approved experiments. Conduct STPSat-7 and STP-H10 launch activities, and conduct other launch activities as required.</p> <p>FY 2025 Plans: Continue to Support spaceflight worthiness and "Do No Harm" Certification. Execute STP-S29A, STP-S29B, STP-AR1, and other small launch initiatives as required. Continue STP-5 medium launch initiative. Plan and complete technical analysis for commercial rideshare launch of DoD SERB experiments and ISARB-approved experiments. Conduct STPSat-7, STP-H10 and Transporter-10 (T-10) launch activities, and conduct other launch activities as required.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased due to multiple simultaneous launch activities during this year.</p>		7.057	7.164	12.690
<p>Title: On-Orbit Satellite Operations</p> <p>Description: Execute first-year operations and operations support for STP-sponsored missions.</p> <p>FY 2024 Plans: Continue on-orbit operations for SPIRRAL (Space Power InfraRed Regulation and Analysis of Lifetime). Continue on-going operations for ISS payloads and DoD SERB payloads as requested. Complete Mission Operations for STP-H9, STP-S28A</p>		0.776	2.000	1.529

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 6: RDT&E Management Support	R-1 Program Element (Number/Name) PE 1206864SF / Space Test Program (STP)
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>(RECURVE payload), STP-S28B (XVI payload), STP-S28C (EPIC Athena payload), STP-S28AR1, STP-27VPD (Coordinated Ionospheric Reconstruction Cubesat Experiment (CIRCE) and Experiment for Characterizing the Lower Ionosphere and Prediction of Sporadic-E (ECLIPSE) payloads). Prepare on-orbit operations for STP-H10, STP-S29A, W/V-band Satellite Communications Experiment-Transponder (WSCE-T), and STPSat-7.</p> <p>FY 2025 Plans: Continue on-orbit operations for SPIRRAL. Continue on-going operations for ISS payloads and DoD SERB payloads as requested. Complete Mission Operations for STP-H9, STP-S28A (RECURVE payload), STP-T8 (XVI payload), STP-T10 (EPIC Athena payload), and STP-AR1. Initiate and conduct on-orbit operations for STP-H10, STPSat-7 and STP-S29A. Prepare on-orbit operations for W/V-band Satellite Communications Experiment-Transponder (WSCE-T) and SIRI-III.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to completion of some specific mission operations.</p>			
Accomplishments/Planned Programs Subtotals	27.104	30.192	30.279

D. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

E. Acquisition Strategy
STP will continue to use the competitively awarded Department Of Defense (DoD) Human-rated Payload Support Task Order (DHSTO) contract (awarded August 2018) to support DoD payloads on National Aeronautics and Space Administration (NASA) exploration vehicles as well as other available space transportation capabilities. STP will conduct acquisition activities to award a follow-on contract to the DHSTO. STP will competitively award the Space Test Experiments Platform (STEP) 2.0 contract (FY 2024) for bus acquisition, payload integration, and on-orbit support. STP will use existing mission partner contracts to leverage cost savings or technological efficiencies, including partnerships with AFRL (including the Research and Development Integrated Space Experiments (RISE) contract), and other mission partners. Acquisition strategies will be developed to determine the need for additional contracts to meet payload integration, launch and on-orbit operations requirements. Additionally, STP uses an SSC Advisory & Assistance Support (A&AS) contract (SSC Acquisition and Finance Support (SAFS)-II and its follow-on SAFS-III), and a SSC SETA contract SSC Technical Support-III (STS-III), as well as FFRDC support through Aerospace.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 1201017SF / Global Sensor Integrated on Network (GSIN)
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	5.321	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.321
675368: GSIN (Global Integrated Sensor Network)	-	5.321	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.321
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

Note
 Beginning in FY 2024 this program will be captured under PE 0101318F / Service Support to STRATCOM - Global Strike.

A. Mission Description and Budget Item Justification

The missions of US Space Command (USSPACECOM) and US Strategic Command (USSTRATCOM) include establishing and providing full-spectrum, global strike, coordinated space and information operations capabilities to meet both deterrent and decisive national security objectives and to provide operational space support, integrated missile defense, Global Command Control, Communications, and Computers Intelligence Surveillance and Reconnaissance (C4ISR), nuclear enterprise, and specialized planning expertise.

The Nation's strategic Command and Control (C2) sensors and mission planning programs cannot rapidly exchange information across multiple missions, creating ambiguity that delays time critical national C2 decision making processes. Global Sensor Integrated on Network (GSIN) developed and established a unified schema that integrates disparate Missile Warning (MW), Missile Defense (MD), Technical Intelligence (TI), Measurement and signature intelligence (MASINT), and a variety of non-traditional data into a single, exposed data set, providing resilient and unambiguous MW/MD data to national leadership. GSIN also enables existing radars and sensors to provide data in net-centric formats consumable by other authorized systems and mission areas, thus reducing the need to acquire more systems. Activities also include studies and analysis to support current program planning, execution, and future program planning.

Global Data Integration (GDI) is the new project name previously known as Global Sensor Integration on Networks (GSIN). GDI supports the DoD Data Strategy, by exposing, transporting, and fusing previously stove-piped data and making it available, exploitable, and able to be analyzed for a variety of mission perspectives, agnostic of the Information Technology (IT) platform. GDI directly supports USSPACECOM, USSTRATCOM and other Combatant Commands and Major Commands, and Nuclear Enterprise Center (NEC) mission sets.

As a leading Data as a Service (DaaS) and Analytics as a Service (AaaS) provider, GDI provides access to over 1,300+ diverse data sources; meshing selected systems and sensors, from tactical to strategic, including the nation's most modern and capable assets, improved algorithms, mobility, and forward deployment to provide earlier cross-cueing and expanded decision space when every second counts. GDI enables creation of a User-Defined Operating Picture (UDOP) to provide a single, unambiguous missile event picture allowing real-time collaboration for nuclear C2 and improved senior leader situational awareness (SA) for effective decision-making.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force Date: March 2024

Appropriation/Budget Activity
3620F: Research, Development, Test & Evaluation, Space Force I BA 7:
Operational Systems Development

R-1 Program Element (Number/Name)
PE 1201017SF / Global Sensor Integrated on Network (GSIN)

GDI also improves Space Domain Awareness (SDA) by accessing additional sensor capability and provides this data for the larger space order of battle capabilities. GDI dramatically improves the ingestion of non-traditional, but readily available, non-US government and commercial data to the Space Force satellite catalog. GDI addresses US Northern Command (USNORTHCOM) and USSTRATCOM's signed Joint Emergent Operational Need (JEON) ST-0010 request for uninterrupted traditional and non-traditional sensor data integration, and is an enabling capability supporting the Global Threat Characterization Assessment (GTCA) Operational Planning Team report. GDI provides critical and unique data to USSPACECOM SDA data repositories to facilitate the large Space Battle Management Command and Control (BMC2) suite of capabilities/programs. Finally, GDI provides Cross Domain Solution (CDS) access, machine learning, data analysis and correlation/fusion functions to optimize SA in the field.

The GDI Program includes two major thrusts: GDI Development; and Radar, Sensor, Technical Intelligence (TI), and Allied Systems data integration.

The GDI Development effort includes four sub-efforts: 1) DATABAHN; 2) Fusion Engine for All-Source Tracking (FEAST), 3) Analytical Collaborative Environment - Multi Intelligence (ACE-M), and 4) Data Integrity (DI) efforts.

- DATABAHN includes developing and fielding dedicated CDS Concepts of operation (CONOPS), including geographically-separated, redundant nodes, to provide greater operational resiliency.
- FEAST fuses and correlates Radio Assisted Detection and Ranging (RADAR), Overhead Persistent Infrared (OPIR) and Electronic Signals Intelligence (ELINT) data at the SECRET level, and provides high-fidelity source geolocation in support of multiple DoD and Intelligence Community (IC) organizations. This capability is being replicated on Joint Worldwide Intelligence Communications System (JWICS), greatly increasing the functionality and value to the warfighter.
- ACE-M is a cloud-based, multi enclave (Secure Internet Protocol Router (SIPR)/JWICS), battlespace awareness and tactical decision aid capability which provides agile access to authoritative and dynamic intelligence data feeds, analytics, and geospatial information layers in a single visualization environment.
- DI develops plans to use artificial intelligence (AI) and block chain technology in support of data governance, provenance and discoverability.

The Radar, Sensor, Technical Intelligence (TI), and Allied Systems data integration effort designs, develops, exposes and integrates data from radar, sensors and technical intelligence systems in regions of the world where potential GDI users currently do not have coverage.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver GDI capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826SF, 605827SF, 0605828SF, 0605829SF, 0605830SF, 0605831SF, 0605832SF, and 0605898SF.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 1201017SF I Global Sensor Integrated on Network (GSIN)
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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	5.321	0.000	0.000	0.000	0.000
Current President's Budget	5.321	0.000	0.000	0.000	0.000
Total Adjustments	0.000	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	0.000	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Title: Global Data Integration (GDI) Development</p> <p>Description: Effort title changed from "Global Data Integration (GDI)" to "Global Data Integration (GDI) Development" to differentiate major thrust from new project title. This is not a new start.</p> <p>Develop common Extensible Markup Language (XML) net-enabled data schemas and configuration management processes and procedures for Missile Warning, Missile Defense, Space, MASINT/Technical Intelligence, and Sensor data to manage the XML schema and associated XML messaging and services. Develop technical outreach for potential new GDI data consumers and providers who require GDI sensor data. Upgrade GDI capabilities as Defense Information Systems Agency (DISA) Enterprise Services evolve. Continue modifications to data services. Support integration of GDI sensor data into appropriate registries/catalogs. Continue development of GDI data services to enable visualization in a common operating picture. Conduct studies and demonstrations of SSA capabilities, data correlation, and assessment services for risk reduction evaluations.</p> <p>FY 2024 Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: N/A</p>	4.821	0.000	-
<p>Title: Radar, Sensor, Technical Intelligence (TI), and Allied Systems</p> <p>Description: Radar, sensor, technical intelligence and Allied Systems: Designs, develops, exposes and integrates data from radar, sensors and technical intelligence systems in regions of the world where potential GDI users currently do not have coverage. Provide real time data from systems that previously reported in hours or days after critical events. Conduct studies/</p>	0.500	0.000	-

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1201017SF / <i>Global Sensor Integrated on Network (GSIN)</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
surveys/meetings as necessary to continually identify systems meeting GDI user data exposure needs. Designs, develops, tests, exposes, and integrates SDA data from previously untapped systems into space production systems and the Global Information Grid (GIG). Develop implementation plans to mature data exposure capabilities.			
FY 2024 Plans: N/A			
FY 2024 to FY 2025 Increase/Decrease Statement: N/A			
Accomplishments/Planned Programs Subtotals	5.321	0.000	-

D. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

E. Acquisition Strategy

GDI uses existing government contract vehicles whenever available, from agencies such as Missile Defense Agency (MDA) or Air Force Life Cycle Management Center (AFLCMC) to develop and modernize the combined SDA/MW/MD/MASINT/TI data exposure architecture and solution. When appropriate contracts do not exist or not available to GDI, USSTRATCOM awards new contracts in support of responsive and consistent GDI goals. The contracts are managed by the relevant organization's contracting office.

Massachusetts Institute of Technology/Lincoln Labs (MIT/LL) will provide the Data Integrity effort based upon ongoing research as an FFRDC.

All contracts are competed whenever possible.

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force			Date: March 2024					
Appropriation/Budget Activity 3620F / 7			R-1 Program Element (Number/Name) PE 1201017SF / <i>Global Sensor Integrated on Network (GSIN)</i>			Project (Number/Name) 675368 / <i>GSIN (Global Integrated Sensor Network)</i>		

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>DATABAHN</i>	
Production/Fielding	██████████
Initial Operational Capability	██████████
Integration and Testing	██████████
Full Operational Capability	██████████
<i>FEAST</i>	
Development, Integration, and Testing	██████████
<i>ACE-M</i>	
Common Operating Picture (COP) in a Cross Domain Solution (CDS) Environment	██████████
DATABAHN Ingestion into COP	████████████████████
Resiliency Testing of GDI's Three Pillars	██
<i>DI</i>	
R&D Proof of Concept	██
<i>Radar, Sensor, Technical Intelligence (TI) and Allied Systems</i>	
(RADAR 1) Integration and Testing	██████████
(RADAR 1) Initial Operational Capability	██████████
(RADAR 2) Design/Develop	██████████
(RADAR 2) Production/Fielding	██
(RADAR 2) Integration and Testing	██
(RADAR 2) Initial Operational Capability	██████████
(RADAR 3) Design/Develop	██████████
(RADAR 3) Production/Fielding	██
(RADAR 3) Integration and Testing	██

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024	
Appropriation/Budget Activity 3620F / 7		R-1 Program Element (Number/Name) PE 1201017SF / <i>Global Sensor Integrated on Network (GSIN)</i>	
		Project (Number/Name) 675368 / <i>GSIN (Global Integrated Sensor Network)</i>	
	FY 2023	FY 2024	FY 2025
	FY 2026	FY 2027	FY 2028
	FY 2029		
	1 2 3 4	1 2 3 4	1 2 3 4
	1 2 3 4	1 2 3 4	1 2 3 4
(RADAR 3) Initial Operational Capability			

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1201017SF / <i>Global Sensor Integrated on Network (GSIN)</i>	Project (Number/Name) 675368 / <i>GSIN (Global Integrated Sensor Network)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
DATABAHN				
Production/Fielding	1	2023	3	2023
Initial Operational Capability	4	2023	4	2023
Integration and Testing	4	2023	1	2024
Full Operational Capability	2	2024	2	2024
FEAST				
Development, Integration, and Testing	1	2023	3	2023
ACE-M				
Common Operating Picture (COP) in a Cross Domain Solution (CDS) Environment	1	2023	4	2023
DATABAHN Ingestion into COP	1	2023	4	2024
Resiliency Testing of GDI's Three Pillars	3	2023	2	2027
DI				
R&D Proof of Concept	1	2023	4	2027
Radar, Sensor, Technical Intelligence (TI) and Allied Systems				
(RADAR 1) Integration and Testing	1	2023	1	2023
(RADAR 1) Initial Operational Capability	2	2023	2	2023
(RADAR 2) Design/Develop	2	2023	4	2023
(RADAR 2) Production/Fielding	4	2023	4	2025
(RADAR 2) Integration and Testing	4	2025	3	2027
(RADAR 2) Initial Operational Capability	4	2027	4	2027
(RADAR 3) Design/Develop	4	2023	4	2023
(RADAR 3) Production/Fielding	1	2024	1	2026

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1201017SF / <i>Global Sensor Integrated on Network (GSIN)</i>	Project (Number/Name) 675368 / <i>GSIN (Global Integrated Sensor Network)</i>

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
(RADAR 3) Integration and Testing	1	2026	3	2027
(RADAR 3) Initial Operational Capability	4	2027	4	2027

Note
All RADAR timelines are notional, pending FMS actions.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203001SF / <i>Family of Advanced BLoS Terminals (FAB-T)</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	124.394	91.369	2.607	0.000	2.607	0.307	0.313	0.005	0.005	0.000	219.000
672490: <i>Family of Advanced Beyond Line-of-Sight Terminals (FAB-T)</i>	-	6.200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.200
673035: <i>Presidential and National Voice Conferencing</i>	-	33.800	35.319	2.003	0.000	2.003	0.307	0.313	0.005	0.005	0.000	71.752
673040: <i>Force Element Terminal</i>	-	84.394	56.050	0.604	0.000	0.604	0.000	0.000	0.000	0.000	0.000	141.048

A. Mission Description and Budget Item Justification

Activities funded in this program element continue to pay for AN/USQ-225 integration into multiple legacy systems, other ongoing NC3 acquisition programs, and future capabilities for the overall AF NC3 WS.

The Family of Advanced Beyond Line-of-Sight Terminals (FAB-T) - Command Post Terminal (CPT), Presidential and National Voice Conferencing (PNVC) Integrator, and Force Element Terminal (FET) programs - transitioned from AFPEO/SP to AFPEO/NC3 effective December 2018.

The FAB-T - Command Post Terminal (FAB-T CPT) project replaces legacy Milstar (AFCPT) terminals and will provide Extremely High Frequency (EHF) protected high data rate communication for nuclear and conventional forces to include PNVC. FAB-T CPT will provide this new, highly secure, state-of-the-art capability for Department of Defense (DoD) platforms to include strategic platforms and airborne/ground command posts via Milstar, Advanced EHF (AEHF), and Evolved Strategic SATCOM (ESS) satellite constellations. FAB-T CPTs will also support the critical command and control (C2) of the Milstar, Advanced EHF (AEHF), and Evolved Strategic SATCOM (ESS) satellite constellations.

The Presidential and National Voice Conferencing (PNVC) Integrator project is a critical element of the Nuclear Command, Control, and Communications (NC3) System. PNVC integrator replaces the Survivable Emergency Conferencing Network (SECN) capability, and will provide anti-jam, anti-scintillation, survivable, and enduring voice communications via AEHF and ESS satellite constellations for national and strategic users. There are several components being developed and procured by other organizations that must be synchronized to expeditiously field the capability. The PNVC Integrator is responsible for end-to-end integration of these components, to include requirements traceability, end-to-end system testing, configuration and checkout activities, training and technical manuals, network transition support, identification of deficiencies in overall PNVC system capability, enterprise, and life cycle support for PNVC components. The AFPEO/SP approved entry into the acquisition lifecycle as a post MS-A Acquisition Category (ACAT) III Program of Record in January 2016. Starting in December 2018, PNVC Integrator became responsible for the funding requests of all program elements related to the Defense Information Systems and Agency (DISA) components of the PNVC System in accordance with FY 2018 National Defense Authorization Act, Sec. 1661. In March 2019, the AFPEO/NC3 declared the PNVC Integrator an ACAT II Program based on the inclusion of DISA funding in the program budget.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203001SF / <i>Family of Advanced BLoS Terminals (FAB-T)</i>
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The FAB-T - Force Element Terminal (FAB-T FET) program replaces the Ultra High Frequency (UHF) Milstar terminals and provides secure, protected, and survivable communications for the strategic warfighter through airborne-based Military Satellite Communication (MILSATCOM) terminals. The FAB-T FET will provide worldwide nuclear and non-nuclear, survivable, anti-jam Low Probability of Detect (LPD)/ Low Probability of Intercept (LPI) data and voice communications. The FAB-T FET will be interoperable with Advanced Extremely High Frequency (AEHF), Enhanced Polar Systems - Recapitalization (EPS-R), and Evolved Strategic SATCOM (ESS) satellite constellations utilizing Extended Data Rate (XDR) waveforms and will be installed on the B-52 aircraft (threshold). FAB-T FET was designated as a Middle Tier of Acquisition (MTA) in February 2019.

The total cost of the FAB-T FET Middle Tier of Acquisition effort is 504.65 million and is fully funded across the Future Years Defense Program. FAB-T FET is planned to transition to the Major Capability Acquisition (MCA) Pathway at Milestone C.

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. In PY 0.752 million was expended for civilian pay expenses in this program element, and in CY 0.775 million is forecasted for civilian pay expenses in this program element.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	128.243	91.369	2.603	0.000	2.603
Current President's Budget	124.394	91.369	2.607	0.000	2.607
Total Adjustments	-3.849	0.000	0.004	0.000	0.004
• 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	-3.849	0.000			
• Other Adjustments	0.000	0.000	0.004	0.000	0.004

Change Summary Explanation

FY25 base adjustment due to inflation correction.

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 7					R-1 Program Element (Number/Name) PE 1203001SF / Family of Advanced BLoS Terminals (FAB-T)				Project (Number/Name) 672490 / Family of Advanced Beyond Line-of-Sight Terminals (FAB-T)			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
672490: Family of Advanced Beyond Line-of-Sight Terminals (FAB-T)	-	6.200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.200
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The FAB-T - Command Post Terminal (FAB-T CPT) project replaces legacy Milstar (AFCPT) terminals and will provide Extremely High Frequency (EHF) protected high data rate communication for nuclear and conventional forces to include Presidential and National Voice Conferencing (PNVC). FAB-T CPT will provide this new, highly secure, state-of-the-art capability for Department of Defense (DoD) platforms to include strategic platforms and airborne/ground command posts via Milstar, Advanced EHF (AEHF), and Evolved Strategic SATCOM (ESS) satellite constellations. FAB-T CPTs will also support the critical command and control (C2) of the Milstar, Advanced EHF (AEHF), and Evolved Strategic SATCOM (ESS) satellite constellations. The Department of the Air Force (DAF) will continue development of the FAB-T CPT, performing systems engineering, architecture studies, development and operational test efforts, terminal interoperability with the full AEHF satellite constellation activities, and other program activities to meet current and future emerging SATCOM requirements.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: FAB-T CPT Development	6.200	0.000	0.000
Description: The FAB-T CPT program will provide EHF voice and data Military Satellite Communication (MILSATCOM) for nuclear and conventional forces as well as airborne and ground command posts with connectivity to Milstar and AEHF satellites.			
FY 2024 Plans: The FAB-T CPT program continues to provide EHF voice and data MILSATCOM for nuclear and conventional forces as well as airborne and ground command posts with connectivity to Milstar, AEHF, and ESS satellites. FAB-T CPT is scheduled to complete development of efforts required for NSA AEHF terminal certification, specifically an update to the software encryption station.			
Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc.			
FY 2025 Plans: N/A - FAB-T CPT is scheduled to complete development prior to FY 2025.			
FY 2024 to FY 2025 Increase/Decrease Statement: N/A			
Accomplishments/Planned Programs Subtotals	6.200	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203001SF / Family of Advanced BLoS Terminals (FAB-T)	Project (Number/Name) 672490 / Family of Advanced Beyond Line-of-Sight Terminals (FAB-T)
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C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2023	FY 2024	FY 2025	FY 2025	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	Cost To	
			Base	OCO	Total					Complete	Total Cost
• SPSF 01 FBLOST FAB-T: FAB-T	13.078	21.749	15.589	-	15.589	14.426	5.062	5.169	5.273	Continuing	Continuing
• SPSF 01 FBLOST PNVC: FAB-T	3.066	3.308	1.675	-	1.675	1.711	1.757	0.000	0.000	0.000	11.517
• SPSF 01 SPAF FET: FAB-T	0.000	121.634	234.655	-	234.655	148.819	23.477	23.973	24.457	Continuing	Continuing
• RDTE 07 FET: FAB-T	84.394	56.050	0.604	-	0.604	0.000	0.000	0.000	0.000	0.000	141.048
• RDTE 07 PNVC: FAB-T	33.800	35.319	2.003	-	2.003	0.307	0.313	0.005	0.005	Continuing	Continuing

Remarks

D. Acquisition Strategy

FAB-T CPT Acquisition Strategy: In FY 2012, the government restructured the FAB-T CPT development program to introduce competition into the acquisition strategy in order to reduce risk in delivering this capability as well as to drive down production costs. To ensure the best value to the government, the DAF awarded production contracts in September 2013 to both contractors (Boeing and Raytheon). The production contracts began with production planning for both contractors. In June 2014, the DAF down-selected to Raytheon. Development and production of FAB-T CPTs continued with Raytheon. The first Production contract options to produce FAB-T CPTs were exercised after a successful Milestone C decision was approved September 1, 2015. FAB-T CPT will proceed to a Full Rate Production Decision following completion of terminal certification conducted via initial operational test & evaluation activities.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203001SF / Family of Advanced BLoS Terminals (FAB-T)	Project (Number/Name) 672490 / Family of Advanced Beyond Line-of-Sight Terminals (FAB-T)
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
FAB-T CPT Prime Contract	Various	Raytheon : Marlboro, MA	-	5.800	Dec 2022	-		-		-		-	Continuing	Continuing	-
FAB-T CPT Technical Mission Analysis	Various	Various : Various	-	0.400	Dec 2022	-		-		-		-	Continuing	Continuing	-
Subtotal			-	6.200		-		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		-	6.200	-	-	-	Continuing	Continuing	N/A

Remarks
Prior Years funding, FY 2016/FY 2017 \$95.229M was executed in Program Element (PE) 0303001F. Prior to FY 2016, \$180.602M was executed in PE 0303601F.

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force			Date: March 2024				
Appropriation/Budget Activity 3620F / 7		R-1 Program Element (Number/Name) PE 1203001SF / Family of Advanced BLoS Terminals (FAB-T)			Project (Number/Name) 672490 / Family of Advanced Beyond Line- of-Sight Terminals (FAB-T)		

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

FAB-T	
FAB-T CPT AEHF Terminal Certification	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203001SF / <i>Family of Advanced BLoS Terminals (FAB-T)</i>	Project (Number/Name) 672490 / <i>Family of Advanced Beyond Line-of-Sight Terminals (FAB-T)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>FAB-T</i>				
FAB-T CPT AEHF Terminal Certification	1	2023	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 7					R-1 Program Element (Number/Name) PE 1203001SF / Family of Advanced BLoS Terminals (FAB-T)				Project (Number/Name) 673035 / Presidential and National Voice Conferencing			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
673035: Presidential and National Voice Conferencing	-	33.800	35.319	2.003	0.000	2.003	0.307	0.313	0.005	0.005	0.000	71.752
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Presidential and National Voice Conferencing (PNVC) Integrator project is a critical element of the Nuclear Command, Control, and Communications (NC3) System. PNVC integrator replaces the Survivable Emergency Conferencing Network (SECN) capability, and will provide anti-jam, anti-scintillation, survivable, and enduring voice communications via Milstar, Advanced EHF, and ESS satellite constellations for national and strategic users. There are several components being developed, procured and updated by other organizations that must be synchronized to expeditiously field this capability. The PNVC Integrator is responsible for end-to-end integration of these components, to include requirements traceability, end-to-end system testing, configuration and checkout activities, training and technical manuals, network transition support, identification of deficiencies in overall PNVC system capability, enterprise, and life cycle support for PNVC components. The AFPEO/SP approved entry into the acquisition life-cycle as a post MS-A Acquisition Category (ACAT) III Program of Record in January 2016. In March 2019 the AFPEO/NC3 declared the PNVC Integrator an ACAT II Program based on updated approved budget request.

Starting in December 2018 PNVC Integrator became responsible for the funding requests of all program elements related to the Defense Information Systems and Agency (DISA) components of the PNVC System in accordance with FY 2018 National Defense Authorization Act, Sec. 1661. In October 2021, PNVC completed Milestone B/C.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: PNVC Integrator	33.800	35.319	2.003
Description: PNVC is the SECN replacement capability which provides anti-jam, anti-scintillation, survivable, and enduring voice communications via Milstar, Advanced EHF, and ESS satellite constellations for national and strategic users. The PNVC capability consists of constituent programs being developed and produced by other organizations. This program will integrate, test, and support configuration of hardware from these other programs. PNVC components will be installed at ground fixed and mobile command locations as well as three aircraft platforms.			
FY 2024 Plans: The PNVC Integrator will continue to conduct integration and checkout activities and training at remaining operational sites world-wide, conduct cyber-security testing, and continue to work closely with the applicable sustainment organizations, as they make their preparations for becoming responsible for PNVC sustainment, engineering, and maintenance.			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203001SF / Family of Advanced BLoS Terminals (FAB-T)	Project (Number/Name) 673035 / Presidential and National Voice Conferencing

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>PNVC Integrator activities will include, but are not limited, to program office support, prototyping, test planning and execution, deficiency resolution, logistics and sustainment support planning, component product support, risk reduction activities, technical analysis and studies, platform integration and support, and integration of laboratory support. PNVC will continue to support component fielding, conduct site integration and checkout, finish integrated developmental activities and prepare for Initial Operational Capability.</p> <p>Activities funded in this program continue to pay for AN/USQ-225 integration into multiple legacy systems, other ongoing NC3 acquisition programs, and future capabilities for the overall AF NC3 WS.</p> <p>FY 2025 Plans: The PNVC Integrator will continue to conduct integration and checkout activities and training at remaining operational sites world-wide and continue to work closely with the applicable sustainment organizations, as they make their preparations for becoming responsible for PNVC sustainment, engineering, and maintenance.</p> <p>PNVC Integrator activities will include, but are not limited, to program office support, test execution, deficiency resolution, logistics and sustainment support planning, component product support, risk reduction activities, technical analysis and studies, platform integration and support at final locations, and integration of laboratory support. PNVC will continue to support component fielding, conduct site integration and checkout, finish integrated developmental activities, and prepare for Initial Operational Capability followed by Full Operational Capability shortly after. Following conclusion of Multi-Service Operational Test and Evaluation (MOT&E), PNVC will conclude software maturation. Software maturation will now extend into FY25.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Activities decrease FY 2024 to FY 2025 as the program prepares for Initial Operational Capability, followed by Full Operational Capability shortly after, and transition to sustainment. There will be small amounts of integration activities and deficiency corrections required in FY 2025.</p>			
Accomplishments/Planned Programs Subtotals	33.800	35.319	2.003

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u> <u>Base</u>	<u>FY 2025</u> <u>OCO</u>	<u>FY 2025</u> <u>Total</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>FY 2029</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• SPSF 01 FBLOST FAB-T: FAB-T	13.078	21.749	15.589	-	15.589	14.426	5.062	5.169	5.273	Continuing	Continuing
• SPSF 01 FBLOST PNVC: FAB-T	3.066	3.308	1.675	-	1.675	1.711	1.757	0.000	0.000	0.000	11.517
• SPSF 01 SPAF FET: FAB-T	0.000	121.634	234.655	-	234.655	148.819	23.477	23.973	24.457	Continuing	Continuing
• RDTE 07 FET: FAB-T	84.394	56.050	0.604	-	0.604	0.000	0.000	0.000	0.000	0.000	141.048

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203001SF / <i>Family of Advanced BLoS Terminals (FAB-T)</i>	Project (Number/Name) 673035 / <i>Presidential and National Voice Conferencing</i>

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2023	FY 2024	FY 2025	FY 2025	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	Cost To	Total Cost
			Base	OCO	Total					Complete	
• RDTE 07 FAB-T CPT: <i>FAB-T</i>	6.200	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6.200

Remarks

D. Acquisition Strategy

PNVC Acquisition Strategy: On May 15, 2015 the Deputy Secretary of Defense assigned the PNVC End-to-End Integration responsibility to the DAF; effective May 16, 2015, SAF/AQ designated the AFPEO/SP. In March 2019 the AFPEO/NC3 declared the PNVC Integrator an ACAT II Program based on updated approved budget request. The PNVC End-to-End Integrator program is responsible for requirements traceability, End-to-End system testing, site configuration activities, training and technical manuals, network transition support, identifying deficiencies in the PNVC capability, and enterprise and life cycle support for all PNVC components. Starting in December 2018 PNVC Integration is responsible for all program elements' requests for funding related to the Defense Information Systems and Agency (DISA) components of the PNVC System in accordance with FY 2018 National Defense Authorization Act, Sec. 1661.

PNVC will continue to support component fielding, conduct site integration and checkout, and prepare for and execute integrated developmental test activities in advance of the PNVC system Initial Operating Capability.

Beginning in FY2020, all PNVC funds were transferred from DISA to Project 673035, for execution.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force												Date: March 2024				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)					Project (Number/Name)							
3620F / 7				PE 1203001SF / Family of Advanced BLoS Terminals (FAB-T)					673035 / Presidential and National Voice Conferencing							
Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
PNVC Prime Contract	Various	Raytheon : Largo, FL	-	20.639	Oct 2022	22.569	Oct 2023	1.503	Oct 2024	-		1.503	Continuing	Continuing	-	
PNVC Technical Mission Analysis	Various	Various : Various	-	4.402	Oct 2022	3.000	Oct 2023	-		-		-	Continuing	Continuing	-	
PNVC Enterprise SE&I	Various	Various : Various	-	2.114	Oct 2022	3.100	Oct 2023	-		-		-	Continuing	Continuing	-	
Subtotal			-	27.155		28.669		1.503		-		1.503	Continuing	Continuing	N/A	
Test and Evaluation (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
PNVC Government Test and LDTO Support	Various	Various : Various	-	0.570	Oct 2022	0.500	Oct 2023	-		-		-	Continuing	Continuing	-	
Subtotal			-	0.570		0.500		-		-		-	Continuing	Continuing	N/A	
Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
PNVC FFRDC	Various	Various : Various	-	3.059	Nov 2022	2.900	Nov 2023	-		-		-	Continuing	Continuing	-	
PNVC A&AS	Various	Various : Various	-	2.135	Nov 2022	2.000	Nov 2023	0.500	Nov 2024	-		0.500	Continuing	Continuing	-	
PNVC Other Support	Various	Various : Various	-	0.881	Nov 2022	1.250	Nov 2023	-		-		-	Continuing	Continuing	-	
Subtotal			-	6.075		6.150		0.500		-		0.500	Continuing	Continuing	N/A	
Project Cost Totals			-	33.800		35.319		2.003		-		2.003	Continuing	Continuing	N/A	
Remarks																

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203001SF / <i>Family of Advanced BLoS Terminals (FAB-T)</i>	Project (Number/Name) 673035 / <i>Presidential and National Voice Conferencing</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>PNVC Integrator</i>				
Multi-Service Operational Test & Evaluation	3	2023	4	2024
Training/Installation and Checkout	1	2023	1	2029
Software Maturation	1	2023	2	2025

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203001SF / Family of Advanced BLoS Terminals (FAB-T)	Project (Number/Name) 673040 / Force Element Terminal
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
673040: Force Element Terminal	-	84.394	56.050	0.604	0.000	0.604	0.000	0.000	0.000	0.000	0.000	141.048
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

The FAB-T - Force Element Terminal (FAB-T FET) program replaces the Ultra High Frequency (UHF) Milstar terminal and provides secure, protected, and survivable communications for the strategic warfighter through airborne-based Military Satellite Communication (MILSATCOM) terminals. The FAB-T FET will provide worldwide nuclear and non-nuclear, survivable, anti-jam Low Probability of Detect (LPD)/ Low Probability of Intercept (LPI) data and voice communications. The FAB-T FET will be interoperable with Advanced Extremely High Frequency (AEHF), Enhanced Polar Systems - Recapitalization (EPS-R), and Evolved Strategic SATCOM (ESS) satellite constellations utilizing Extended Data Rate (XDR) waveforms and will be installed on the B-52 aircraft (threshold). FAB-T FET was designated as a Middle Tier of Acquisition (MTA) in February 2019 and is expected to be designated as Major Capability Acquisition at Milestone C.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: FAB-T FET	84.394	56.050	0.604
Description: Continue development of FETs. Development activities include, but are not limited to, FAB-T FET design, development, and qualification testing.			
FY 2024 Plans: Funding is for the continued development of FETs. FAB-T FET integration and testing activities will include reliability growth testing and fabrication of test assets; prototype and test terminals will support terminal security, environmental, and functional testing, to include flight testing, and early integration efforts.			
Planning and support activities will continue, including qualification test planning, logistics support planning, risk reduction activities for development and follow-on production, technical analysis and studies, platform integration support, program office support, and mitigations for Diminishing Manufacturing Sources and Material Shortages in preparation for terminal production.			
FY 2025 Plans: Funding is for the continued development of FETs. FAB-T FET integration and testing activities will include reliability growth testing and fabrication of test assets; prototype and test terminals will support terminal security, environmental, and functional testing, to include flight testing, and early integration efforts.			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203001SF / Family of Advanced BLoS Terminals (FAB-T)	Project (Number/Name) 673040 / Force Element Terminal

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
Planning and support activities will continue, including qualification test planning, logistics support planning, risk reduction activities for development and follow-on production, technical analysis and studies, platform integration support, program office support, and mitigations for Diminishing Manufacturing Sources and Material Shortages in preparation for terminal production.			
<i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> Funding decrease is based on the reduction of prototype configuration material purchases, integration, testing, and development of FAB-T FET, as production activities continue to ramp up.			
Accomplishments/Planned Programs Subtotals	84.394	56.050	0.604

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
• SPSF 01 FBLOST FAB-T: FAB-T	13.078	21.749	15.589	-	15.589	14.426	5.062	5.169	5.273	Continuing	Continuing
• SPSF 01 FBLOST PNVC: FAB-T	3.066	3.308	1.675	-	1.675	1.711	1.757	0.000	0.000	0.000	11.517
• SPSF 01 SPAF FET: FAB-T	0.000	121.634	234.655	-	234.655	148.819	23.477	23.973	24.457	Continuing	Continuing
• RDTE 07 PNVC: FAB-T	33.800	35.319	2.003	-	2.003	0.307	0.313	0.005	0.005	Continuing	Continuing
• RDTE 07 FAB-T CPT: FAB-T	6.200	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6.200

Remarks

D. Acquisition Strategy
 FAB-T FET Acquisition Strategy: Per the Acquisition Strategy Panel briefed to SAF/AQ on February 7, 2019, FAB-T FET pursued a Rapid Prototyping development Middle Tier Acquisition approach of the National Defense Authorization Act for FY 2016. This Rapid Prototyping program enabled FAB-T FET to accelerate the nominal program development timeline in support of an accelerated USSTRATCOM-requested Initial Operating Capability. FAB-T FET awarded a development effort on January 16, 2020 to develop, build, and test prototypes and test terminals. This Rapid Prototyping effort enabled FAB-T FET to develop, install, and obtain test data from early B-52 FAB-T FET prototypes which will also have residual operations capability. The overall development effort includes system design and build of sufficient test assets to allow for expeditious development, testing, qualification and integration support of the FAB-T FET capability. FAB-T FET will meet B-52 platform requirements to support USSTRATCOM's Strategic Nuclear Command Control and Communication (NC3) mission. On January 4, 2023, SAF/SQ approved the FAB-T FET Milestone C Acquisition Strategy which establishes the plan for the program to transition to the Major Capability Acquisition Pathway at Milestone C. Additionally, the program will begin Low-Rate Initial Production at Milestone C.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force												Date: March 2024			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)						Project (Number/Name)					
3620F / 7				PE 1203001SF / Family of Advanced BLoS Terminals (FAB-T)						673040 / Force Element Terminal					
Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
FAB-T FET Development Contracts	Various	Raytheon : Marlborough, MA	-	61.635	Dec 2022	38.199	Dec 2023	0.401	Dec 2024	-		0.401	Continuing	Continuing	-
FAB-T FET Technical Mission Analysis	Various	Various : Various	-	0.633	Dec 2022	1.000	Dec 2023	0.103	Dec 2024	-		0.103	Continuing	Continuing	-
FAB-T FET Enterprise SE&I	Various	Various : Various	-	0.127	Mar 2023	0.100	Mar 2024	-		-		-	Continuing	Continuing	-
Subtotal			-	62.395		39.299		0.504		-		0.504	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
FAB-T FET Test & Evaluation and Assets	Various	Various : Various	-	5.742	Dec 2022	6.500	Dec 2023	0.100	Dec 2024	-		0.100	Continuing	Continuing	-
Subtotal			-	5.742		6.500		0.100		-		0.100	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
FAB-T FET FFRDC	Various	Various : Various	-	6.779	Dec 2022	4.250	Dec 2023	-		-		-	Continuing	Continuing	-
FAB-T FET Other Support	Various	Various : Various	-	2.926	Dec 2022	3.501	Dec 2023	-		-		-	Continuing	Continuing	-
FAB-T FET A&AS	Various	Various : Various	-	6.552	Jan 2023	2.500	Jan 2024	-		-		-	Continuing	Continuing	-
Subtotal			-	16.257		10.251		-		-		-	Continuing	Continuing	N/A
Project Cost Totals			-	84.394		56.050		0.604		-		0.604	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force							Date: March 2024			
Appropriation/Budget Activity 3620F / 7			R-1 Program Element (Number/Name) PE 1203001SF / <i>Family of Advanced BLoS Terminals (FAB-T)</i>			Project (Number/Name) 673040 / <i>Force Element Terminal</i>				
	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract	

Remarks
Beginning in FY 2025, support activities for this program are funded by P-1 Line Item FET000.

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203001SF / Family of Advanced BLoS Terminals (FAB-T)	Project (Number/Name) 673040 / Force Element Terminal

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

FET	
FAB-T FET Development	
FAB-T FET Prototype and Test Asset Testing	
FAB-T Force Element Terminal Production	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203001SF / <i>Family of Advanced BLoS Terminals (FAB-T)</i>	Project (Number/Name) 673040 / <i>Force Element Terminal</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
FET				
FAB-T FET Development	1	2023	2	2026
FAB-T FET Prototype and Test Asset Testing	2	2023	2	2026
FAB-T Force Element Terminal Production	4	2024	4	2029

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203040SF / DCO-Space
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	27.235	76.003	104.088	0.000	104.088	106.673	115.036	115.648	123.470	Continuing	Continuing
673070: <i>Defensive Cyber Ops - Space</i>	-	27.235	76.003	104.088	0.000	104.088	106.673	115.036	115.648	123.470	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Defensive Cyberspace Operations (DCO-S) provides defensive cyber capabilities that protect United States Space Force (USSF) mission systems, to include their associated computer systems, software applications and sensitive operational information against unauthorized intrusion, corruption, and/or destruction. The emphasis of the program is directed toward defensive cyberspace capabilities; computer and network systems security; damage assessment and recovery; cyber threat recognition, attribution, and mitigation; and active response methodologies in response to evolving threats and changes to the cyber environment. These areas of emphasis are realized through research and development, test and acquisition in the areas of proactive defense, defensive counter cyberspace, cyberspace intelligence, surveillance and reconnaissance, command and control situational awareness, persistent network operations, as well as decision support, recovery, and digital forensics.

The development of DCO-S tools for the ground segment implements a combined Development/Security/Operations (DEVSECOPS) framework, which incorporates methodologies, technologies, and tools to deeply embed security best practices into the modern development workflow and tool-chain. This effort primarily institutes two product lines: Manticore (Detect & Identify) and Kraken (Protect & Respond). It will endeavor to identify shared/common platform, infrastructure, and data layer solutions to support open frameworks and architectures across the enterprise ground portfolio. Manticore and Kraken make use of open source and commercial tools to create the platform used to defend space mission systems with some of the content customized to address space-unique requirements such as protocol analytics. There are no commercial off-the-shelf solutions that address the threat to unique USSF systems, so tailored content is required to support the DCO-S mission. The DCO-S capabilities are developed, produced, and deployed as an agile program, leveraging a DEVSECOPS framework to facilitate rapid and timely fielding to operations.

DCO-S enables Space Delta (DEL) 6 and the mission Deltas to perform cyber-integrated space operations that identify, detect, protect against, respond to, and recover from malicious threats to space mission systems. These developments deploy both out-of-band (Manticore) and in-band (Kraken) cyber defense tool suites for the ground mission systems to Space Delta 6 (Cyber Ops) protecting the following mission sets: Protected Communications, Missile Warning, Military Strategic Communications (MILSATCOM), Position Navigation and Timing (PNT), Ballistic Missile Command and Control, Space Domain Awareness (SDA), Nuclear Command Control and Communications (NC3), and Command and Control Satellite Operations (C2 Sat Ops).

The Program Management Office is poised to execute a significantly increased Fiscal Year (FY) 2025 request to support the urgent need to field cyber defense tools to DEL 6 Cyber Squadrons. In previous cycles, primarily mission partner funding supported fielding efforts; however, centralized funding enables maturation and stability in acquisition planning. Software development must also increase and adapt to support software development to on-board classified mission systems and new data types not in the baseline software to keep pace with the cyber threat. Systems engineering and integration support must also expand to deploy Manticore systems to additional

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203040SF / <i>DCO-Space</i>
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mission sites in a timely manner. Furthermore, the DCO-S Wide Area Network development must evolve to meet security, sustainment, and reach-back requirements for the USSF Cybersecurity Service Provider and Cyber Squadrons. Finally, initial transition of space segment DCO-S tools into mission systems and integration with Manticore and Kraken is required to provide a total solution to DEL 6 cyber units and provide comprehensive protection of USSF mission systems, necessary to outpace the threat.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605827F, 0605828F, 0605829F, 0605831F, 0605832F, 0605833F, 0605898F, 0606398F.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	28.087	76.003	68.796	0.000	68.796
Current President's Budget	27.235	76.003	104.088	0.000	104.088
Total Adjustments	-0.852	0.000	35.292	0.000	35.292
• 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	-0.852	0.000			
• Other Adjustments	0.000	0.000	35.292	0.000	35.292

Change Summary Explanation

FY 2025: +35.292M increase for additional USSF Cyber Defense tools to support cyber-enabled space operations. The FY 2025 request increased significantly to support the urgent need of cyber defense tools to be fielded to USSF Cyber Squadrons that are to be activated in Delta 6. Software development must also increase and adapt to support software development to on-board classified mission systems and new data types not in the baseline software to keep pace with the cyber threat.

FY 2025: The FY 2025 funding request was reduced by \$4.1 million to account for the availability of prior year execution balances.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
Title: Defensive Cyberspace Operations - Space (DCO-S)	27.235	76.003	104.088

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203040SF / <i>DCO-Space</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
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Description: Funding supports cyber hardening and Defensive Cyberspace Operations for Space (DCO-S) activities for the space enterprise. Provides space enterprise defensive cyber solutions to counter advanced persistence cyber threats, through rapid fielding of operational prototypes using agile development methods.

FY 2024 Plans:

Enhance the development, deployment, tuning, and continued expansion of Manticore (Identify & Detect) and Kraken (Protect & Respond) to additional mission areas; build, test, and deliver valuable features at a faster pace to meet growing demands of cyber defenders. Scale development teams to increase emphasis on cyber threat recognition, information sharing, and active response methodologies to combat evolving threats and prepare for inevitable changes to the cyber domain. Augment platform, Continuous Integration/Continuous Deployment (CI/CD), and test teams to provision, manage, optimize, and secure infrastructure on premise and cloud environments (servers, networking to databases, etc.), carry out software deployments, validate the reliability of features, manage CI/CD pipelines, and ensure all tools and platforms are available for the development teams. Upgrade databases for all product-line documentation, grow infrastructure support of existing codebase and stand-up the cloud environment for Manticore.

Deploy both out-of-band (Manticore) and in-band (Kraken) cyber defense tool suites to Space Delta 6 (Cyber Ops). Additional DCO-S mission systems will be on-boarded to protect the following mission sets: Protected Communications, Missile Warning, Military Strategic Communications (MILSATCOM), Position Navigation and Timing (PNT), Ballistic Missile Command and Control, Space Domain Awareness (SDA), Nuclear Command Control and Communications (NC3), and Command and Control Satellite Operations (C2 Sat Ops). Increase Systems Engineering & Integration (SE&I) support to ensure seamless data stream integration with each new on-boarded mission system. Through AFRL Cyber Research & Development, increase efforts to develop technical documentation, perform integration activities and tuning support, and develop plans for product support and sustainment.

Establish baseline for global space cybersecurity competition to help reduce vulnerabilities within existing product lines. Fund efforts to allow independent security researchers to report security exploits, issues, and hardware flaws which increases the chances that bugs are found and reported before malicious attacks occur. Leverage other agencies' lessons learned and capability as it pertains to defending space systems.

Expand systems engineering and accreditation support to provide internal test and accreditation plans for security hardening and risk assessments to ensure product line software has optimum security features, countermeasures, and safeguards in place. Maintain modern testing methodologies based on industry best practices; embed the 47th Test Squadron into the development workflow, tool-chain, and CI/CD framework; and provide cybersecurity test support and assessments of applications and

	FY 2023	FY 2024	FY 2025

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203040SF / DCO-Space
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C. Accomplishments/Planned Programs (\$ in Millions)

environments. FFRDCs and other management services provide mission assurance oversight to identify Tactics, Techniques, and Procedures (TTPs) and provide users with space-based training while future proofing systems with the latest technology.

Rapidly respond to threats and implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.

Investigate space segment DCO-S tools for USSF mission systems with focus of integrating with Manticore and Kraken.

FY 2025 Plans:

Expand the development, deployment, tuning, and capability of Manticore (Identify & Detect) and Kraken (Protect & Respond) to additional mission areas; build, test, and deliver valuable features at a faster pace to meet growing demands of cyber defenders. Scale development teams to increase emphasis on cyber threat recognition, information sharing, and active response methodologies to combat evolving threats and prepare for inevitable changes to the cyber domain. Augment platform, Continuous Integration/Continuous Deployment (CI/CD), and test teams to provision, manage, optimize, and secure infrastructure on premise and cloud environments (servers, networking to databases, etc.), carry out software deployments, validate the reliability of features, manage CI/CD pipelines, and ensure all tools and platforms are available for the development teams. Upgrade databases for all product-line documentation, grow infrastructure support of existing codebase, and stand-up the cloud environment for Manticore. Modernize Kraken (in-band) to coincide with Manticore upgrades and to ensure technical performance coincidentally matures across DCO-S toolset capability. Integrate and deploy required software changes mandated from commercial product suppliers due to baseline changes to functionality, end of manufacturing, end of support, or other necessary system changes.

Deploy both out-of-band (Manticore) and in-band (Kraken) cyber defense tool suites to Space Delta 6 (Cyber Ops). Additional DCO-S mission systems will be on-boarded to protect the following mission sets: Protected Communications, Missile Warning, Military Strategic Communications (MILSATCOM), Position Navigation and Timing (PNT), Ballistic Missile Command and Control, Space Domain Awareness (SDA), Nuclear Command Control and Communications (NC3), and Command and Control Satellite Operations (C2 Sat Ops). Increase Systems Engineering & Integration (SE&I) support to ensure seamless data stream integration with each new on-boarded mission system. Through AFRL Cyber Research & Development, increase efforts to develop technical documentation, perform integration activities and tuning support, and develop plans for product support and sustainment. Increase overall deployment activities to on-board additional mission systems at a faster pace to ensure complex classified systems are protected sooner. Classified mission systems will require additional engineering and deployment activities to ensure mission system network traffic is protected during transit between endpoints. Additional efforts will focus on implementing machine learning (ML) to increase the speed of threat detection and reduce the overall reaction time for defense of mission systems.

	FY 2023	FY 2024	FY 2025

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203040SF / DCO-Space
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Establish baseline for global space cybersecurity competition to help reduce vulnerabilities within existing product lines. Fund efforts to allow independent security researchers to report security exploits, issues, and hardware flaws which increases the chances that bugs are found and reported before malicious attacks occur. Leverage other agencies' lessons learned and capability as it pertains to defending space systems and expand capability to defending space systems.</p> <p>Expand systems engineering, development infrastructure, and accreditation support to provide internal test and accreditation plans for security hardening and risk assessments to ensure product line software has optimum security features, countermeasures, and safeguards in place. Maintain modern testing methodologies based on industry best practices; embed the 47th Test Squadron into the development workflow, toolchain and CI/CD framework and provide cybersecurity test support and assessments of applications and environments. FFRDCs and other management services provide mission assurance to identify Tactics, Techniques, and Procedures (TTPs) and provide users with space-based training while future proofing systems with the latest technology.</p> <p>Investigate space segment DCO-S tools for USSF mission systems with focus of integrating with Manticore and Kraken.</p> <p>Rapidly respond to threats and implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p><i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> The FY 2025 request increased significantly to support the urgent need to field cyber defense tools to USSF Cyber Squadrons standing up in DEL 6. Software development must also increase and adapt to on-board classified mission systems and new data types to keep pace with the cyber threat.</p>			
Accomplishments/Planned Programs Subtotals	27.235	76.003	104.088

D. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

E. Acquisition Strategy
Currently, DCO-S is being acquired as an enterprise architecture prototype. The latest DCO-S acquisition strategy is committed to using a modular contracting strategy for fast, agile, and adaptable approaches in order to successfully develop defensive cyber applications and deploy them to the space enterprise and next generation systems. These efforts implement a combined Development/Security/Operations (DEVSECOPS) framework which incorporates methodologies, technologies, and

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity
3620F: *Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development*

R-1 Program Element (Number/Name)
PE 1203040SF / *DCO-Space*

tools to deeply embed security best practices into the modern development workflow and tool-chain. USSF plans to leverage new prototyping techniques, previous Government investments in Federally Funded Research and Development Center (FFRDC), and efforts from Government labs as part of those development activities.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203040SF / DCO-Space	Project (Number/Name) 673070 / Defensive Cyber Ops - Space
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
DCO-S Suite Development	Various	Various : Various	-	5.267	Nov 2022	22.181	Oct 2023	31.246	Oct 2024	-		31.246	Continuing	Continuing	-
Product Line Integration	Various	Various : Various	-	7.781	Nov 2022	31.351	Nov 2023	45.771	Nov 2024	-		45.771	Continuing	Continuing	-
Systems Engineering/ Accreditation	Various	Various : Various	-	4.800	Nov 2022	1.926	Oct 2023	2.838		-		2.838	0.000	9.564	-
Technical Mission Analysis	MIPR	Analysis/Tech Guidance : Various	-	0.479	Oct 2022	0.654	Oct 2023	0.393	Oct 2024	-		0.393	Continuing	Continuing	-
SBIR/STTR	Allot	Not specified. : TBD	-	0.000	Oct 2022	2.263	Oct 2023	3.887	Oct 2024	-		3.887	Continuing	Continuing	-
Subtotal			-	18.327		58.375		84.135		-		84.135	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Developmental Test	PO	Test and Eval : San Antonio, TX	-	0.249	Nov 2022	1.019	Oct 2023	0.988	Oct 2024	-		0.988	Continuing	Continuing	-
Subtotal			-	0.249		1.019		0.988		-		0.988	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
FFRDC	RO	Various : El Segundo, CA	-	5.009	Nov 2022	9.532	Nov 2023	6.227	Nov 2024	-		6.227	Continuing	Continuing	-
A&AS	Various	Various : Various	-	3.119	Nov 2022	6.827	Nov 2023	12.344	Nov 2024	-		12.344	Continuing	Continuing	-
Other	Various	Various : Various	-	0.531	Oct 2022	0.250	Oct 2023	0.394	Oct 2024	-		0.394	Continuing	Continuing	-
Subtotal			-	8.659		16.609		18.965		-		18.965	Continuing	Continuing	N/A

			Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	27.235	76.003	104.088	-	104.088	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203040SF / DCO-Space	Project (Number/Name) 673070 / Defensive Cyber Ops - Space
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	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
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<u>Remarks</u>									
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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203040SF / <i>DCO-Space</i>	Project (Number/Name) 673070 / <i>Defensive Cyber Ops - Space</i>
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FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

DCO-S	
DCO-S Product Line Development and Integration	
DCO-S Deployments	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203040SF / <i>DCO-Space</i>	Project (Number/Name) 673070 / <i>Defensive Cyber Ops - Space</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>DCO-S</i>				
DCO-S Product Line Development and Integration	1	2023	4	2029
DCO-S Deployments	1	2023	4	2029

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203109SF / <i>Narrowband Satellite Communications</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	110.493	103.855	230.785	228.435	0.000	228.435	449.286	672.402	706.163	647.965	Continuing	Continuing
673109: <i>SATCOM MUOS</i>	110.493	103.855	230.785	228.435	0.000	228.435	449.286	672.402	706.163	647.965	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Program MDAP/MAIS Code: 345

A. Mission Description and Budget Item Justification

Narrowband Satellite Communications provides a worldwide, multi-service population of mobile and fixed-site terminal users with Ultra High Frequency (UHF) Narrowband, beyond line of sight satellite communications (SATCOM). Mobile User Objective System (MUOS) significantly increases performance and capacity in support of critical Combatant Command SATCOM priorities. MUOS is the replacement system for the UHF Follow-on (UFO) system, which is currently beyond its design life.

MUOS is comprised of Space, Ground, and User Entry Segments. The Space Segment consists of five geosynchronous satellites to support a four satellite constellation over the intended service life. Each satellite provides a legacy UHF payload that is backward compatible with UFO, and a Wideband Code Division Multiple Access (WCDMA) payload that provides cellular-like capability. MUOS reached full operational capability in October 2019.

The Ground Segment consists of four world-wide Radio Access Facilities (RAFs) and two satellite control facilities. Each RAF includes three 60 ft. antennas and numerous equipment racks. The RAFs in Hawaii and Virginia each include a Switching Facility (SF), and the RAF in Hawaii includes a Network Management Facility (NMF). The User Entry Segment consists of the MUOS waveform that is ultimately integrated into MUOS-capable terminals which are fielded by the services. In addition to providing UHF SATCOM for the Department of Defense, the USSF has the overall responsibility to deliver the End-to-End (E2E) MUOS capability to the warfighter. This responsibility involves systems engineering, integration, network management, and test management of all MUOS system-of-system components.

A Department of Defense Chief Information Officer assessment of anticipated narrowband satellite communication availability led to the Office of Under Secretary of Defense (OUSD) Acquisitions & Sustainment recommendation and OUSD Cost Assessment and Program Evaluation (CAPE) direction to initiate MUOS Service Life Extension (SLE) to acquire and launch two additional MUOS satellites (without legacy payloads). MUOS SLE is projected to extend worldwide WCDMA constellation availability to at least FY 2035 and the supporting ground segment service life to at least FY 2040.

This PE funds systems optimization and modernization to address the dynamic, worldwide electromagnetic and cybersecurity environment in which MUOS operates and MUOS SLE. The PE includes a MUOS Baseline effort, and a MUOS SLE effort. Cost to complete is "Continuing" in the cost table, as the USSF is in the process to determine the cost estimate for this post Milestone C program.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203109SF / <i>Narrowband Satellite Communications</i>
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This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	110.142	230.785	435.486	0.000	435.486
Current President's Budget	103.855	230.785	228.435	0.000	228.435
Total Adjustments	-6.287	0.000	-207.051	0.000	-207.051
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-2.525	0.000			
• SBIR/STTR Transfer	-3.762	0.000			
• Other Adjustments	0.000	0.000	-207.051	0.000	-207.051

Change Summary Explanation

FY 2023: -2.525M; Reprogramming for STP BTR

FY 2025: -76.700M; Adjustment to align with Non-Advocate Cost Assessment (NACA)

FY 2025: -2.600M; Re-alignment to 3022 Procurement, Space Force, Space Procurement P-1 Line MUOS00/Mobile User Objective System to align with NACA

FY 2025: -94.651M; Re-alignment to higher Space Force priorities

FY 2025: -33.100M; Funding request reduction to account for the availability of prior year execution balances

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
Title: Mobile User Objective System (MUOS) Baseline Upgrade	53.525	43.110	30.434
Description: System optimization and modernization to address the dynamic, worldwide electromagnetic and cybersecurity environment in which MUOS operates.			
FY 2024 Plans: Continue system optimization, cybersecurity updates, and electro-magnetic interference (EMI) mitigation efforts to ensure capacity is available to the end user, including the development and fielding of EMI mitigation solutions and inclination control and eclipse contingency studies for the space segment. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Continue E2E MUOS usability enhancements including terminal certification, integration, and test. Continue to investigate and begin development of alternatives to mitigate Legacy UHF communications			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 1203109SF / <i>Narrowband Satellite Communications</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>shortfalls. Activities may include, but are not limited to studies, technical analysis, experimentation, and interoperability and integration efforts with other DoD systems.</p> <p>FY 2025 Plans: Award follow-on ground segment sustainment and modernization contract. Continue systems engineering, system optimization, cybersecurity updates, and EMI mitigation efforts to ensure capacity is available to the end user, including the development and fielding of EMI mitigation solutions and inclination control and eclipse contingency studies for the space segment. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Continue E2E MUOS usability enhancements including terminal certification, integration, and test. Continue development of alternative Integrated Broadcast Service (IBS) solution to mitigate Legacy UHF communications shortfalls and integration and interoperability efforts with other DoD and commercial systems.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to ramp down of baseline Ground segment updates as equipment will be replaced/modernized under SLE.</p>				
<p>Title: Mobile User Objective System (MUOS) Service Life Extension (SLE)</p> <p>Description: MUOS SLE to acquire and launch two additional MUOS satellites without legacy payloads and modernize the ground segment to extend service life from 2030 to 2040.</p> <p>FY 2024 Plans: Continue systems engineering to support space, ground, and waveform segments. Continue satellite design and risk reduction activities for up to two vendors. Activities include spacecraft design, interface control document development, and preparing and conducting systems requirements and tailored design reviews. Initiate ground system modernization across all four radio access facilities, with associated laboratory equipment and associated program office support, through migration to an extensible digital processing architecture. Ground activities include interface testing & verification, and architecture updates. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p>FY 2025 Plans: Complete satellite early design and risk reduction activities for up to two vendors. Activities include spacecraft design, interface control document development, and preparing and conducting systems requirements and tailored design reviews. Continue ground system modernization across all four radio access facilities, with associated laboratory equipment and associated program office support, through migration to an extensible digital processing architecture. Ground activities include interface testing & verification, and architecture updates. Additional activities may include, but are not limited to program office support, Narrowband</p>		50.330	187.675	198.001

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203109SF / <i>Narrowband Satellite Communications</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
Analysis of Alternatives (AoA) follow-on studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.			
<i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> FY 2025 increased due to ramp up of modernization work required to ensure the Ground Segment will be ready prior to the launch of MUOS SV6.			
Accomplishments/Planned Programs Subtotals	103.855	230.785	228.435

D. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
• SPSF 01 BA01 MUOS00: <i>Mobile User Objective System</i>	46.833	101.147	51.601	-	51.601	49.962	51.209	52.290	53.343	0.000	406.385

Remarks

E. Acquisition Strategy
Space Force will use existing MUOS requirements when developing two operationally- similar Service Life Extension (SLE) satellites. On 14 Apr 2022 the program competitively awarded technical and trade studies contracts to three vendors to inform program plans and understanding of required engineering design changes and potential trades. The Service Acquisition Executive approved the program's acquisition strategy on 14 Sep 2022 as a Major Capability Acquisition pathway, post-Milestone C program, and the program is executing to plan. The approved acquisition strategy includes an early FY 2024 competitive award to two vendors for MUOS SVs 6 and 7 design and risk reduction activities and the competitive award for the final design and production contract to one vendor in FY 2026. Service Acquisition Executive approved the Justification and Approval for a follow-on sole source integrated ground contract with General Dynamics Missions Systems. The ground modernization activities will be performed on the existing MUOS Ground contract until efforts transition to the follow-on contract in FY 2025.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203109SF / <i>Narrowband Satellite Com munications</i>	Project (Number/Name) 673109 / <i>SATCOM MUOS</i>
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SLE Ground Engineering Contract	SS/ Various	General Dynamics : Scottsdale, AZ	7.842	16.643	Nov 2022	43.382	Nov 2023	-		-		-	0.000	67.867	-
SLE Ground Engineering Follow-on Contract	SS/ Various	General Dynamics : Scottsdale, AZ	0.000	-		-		138.781	Nov 2024	-		138.781	Continuing	Continuing	-
SLE Technical and Trade Studies	C/FP	Various : Various	13.273	-		-		-		-		-	0.000	13.273	-
SLE Crypto Replacement Plans and Interfaces	MIPR	NSA : Fort Meade, MD	0.553	-		-		-		-		-	0.000	0.553	-
SLE Satellite Design and Risk Reduction Activities	C/FP	TBD : TBD	0.000	23.000	Aug 2023	109.000	Nov 2023	15.300	Dec 2024	-		15.300	0.000	147.300	-
SLE Technical Mission Analysis	RO	Aerospace : El Segundo, CA	0.000	1.335	Oct 2022	2.968	Nov 2023	3.515	Nov 2024	-		3.515	Continuing	Continuing	-
Baseline Ground Engineering Contracts	SS/ Various	Various : Various	65.685	30.000	Nov 2022	35.841	Nov 2023	24.340	Nov 2024	-		24.340	Continuing	Continuing	-
Baseline Space Engineering Contract	SS/ Various	Lockheed Martin : Sunnyvale, CA	0.000	4.403	Nov 2022	0.970	Nov 2023	3.000	Nov 2024	-		3.000	Continuing	Continuing	-
Baseline Electromagnetic Interference	SS/TBD	Adaptive Dynamics Inc : San Diego, CA	4.284	0.600	Nov 2022	0.800	Nov 2023	-		-		-	0.000	5.684	-
L-Band Communications	C/FFP	CesiumAstro : Austin, TX	3.000	-		-		-		-		-	0.000	3.000	-
Baseline SBIR/STTR	Various	Not specified. : TBD	0.000	-		3.228		1.096	Apr 2025	-		1.096	Continuing	Continuing	-
SLE SBIR/STTR	Various	Not specified. : TBD	0.000	-		4.817		6.953	Apr 2025	-		6.953	Continuing	Continuing	-
Narrowband Analysis of Alternatives (AoA)	TBD	Various : Various	5.970	-		-		-		-		-	0.000	5.970	-
Follow-on AoA Studies	TBD	TBD : TBD	0.000	-		-		5.000	Nov 2024	-		5.000	0.000	5.000	-
Subtotal			100.607	75.981		201.006		197.985		-		197.985	Continuing	Continuing	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203109SF / <i>Narrowband Satellite Com munications</i>	Project (Number/Name) 673109 / <i>SATCOM MUOS</i>

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Baseline Upgrade	
Ground System Migration (Waveform Enhancements (ACC))	
Ground System Updates (Cybersecurity / Electromagnetic Interference Mitigation / etc.)	
Systems Engineering	
Space Segment Enhancements	
Service Life Extension (MUOS 6&7 and Ground Modernization)	
Satellite Technical and Trade Studies	
Ground System Studies and Modernization	
Systems Engineering	
Satellite Design and Risk Reduction Activities	
Narrowband Follow-on AoA Studies	
Satellite Final Design, Production, Assembly, Integration and Test Activities	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203109SF / <i>Narrowband Satellite Com munications</i>	Project (Number/Name) 673109 / <i>SATCOM MUOS</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Baseline Upgrade				
Ground System Migration (Waveform Enhancements (ACC)	1	2023	2	2023
Ground System Updates (Cybersecurity / Electromagnetic Interference Mitigation / etc.)	1	2023	3	2027
Systems Engineering	1	2023	4	2029
Space Segment Enhancements	1	2023	4	2029
Service Life Extension (MUOS 6&7 and Ground Modernization)				
Satellite Technical and Trade Studies	1	2023	2	2023
Ground System Studies and Modernization	1	2023	4	2029
Systems Engineering	1	2023	4	2029
Satellite Design and Risk Reduction Activities	1	2024	2	2025
Narrowband Follow-on AoA Studies	1	2025	1	2026
Satellite Final Design, Production, Assembly, Integration and Test Activities	1	2026	4	2029

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 1203110SF I Satellite Control Network (SPACE)
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	38.289	86.465	98.572	0.000	98.572	97.656	96.834	99.773	101.741	Continuing	Continuing
673276: Satellite Control Network	-	38.289	86.465	98.572	0.000	98.572	97.656	96.834	99.773	101.741	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Satellite Control Network (SCN) is a satellite ground terminal network comprised of two communication nodes (Schriever SFB & Vandenberg SFB) and 15 antenna systems. The antennas are distributed around the globe at seven locations -- Vandenberg Tracking Station (VTS), Diego Garcia Station (DGS), Guam Tracking Station (GTS), Hawaii Tracking Station (HTS), New Hampshire Tracking Station (NHS), Thule Tracking Station (TTS) and Telemetry and Commanding Station (TCS) at RAF Oakhanger, England -- to ensure global coverage for over 170 satellites in various orbits operating in a congested and contested environment. The SCN conducts an average of 450+ satellite contacts per day supporting Positioning, Navigation and Timing (PNT), Intelligence, Surveillance and Reconnaissance (ISR), Missile Warning and Missile Defense, Communications, Weather, Launch Vehicle Support, and Research and Development (R&D) for Department of Defense (DoD), Intelligence Community (IC), and National Aeronautics and Space Administration (NASA) operations. While most of the 450+ daily satellite contacts are routine command and control (C2) activities, the SCN is also used during satellite emergencies (e.g. a tumbling satellite) because its high-power antennas are often the only terrestrial assets that can re-establish contact with a non-responsive satellite. During each Fiscal Year, the SCN typically supports multiple space vehicle emergencies, resulting in the preservation of over 4B worth of satellites. In addition to routine and emergency satellite operations C2, the SCN provides support to launch and early orbit operations, ensuring worldwide telemetry during launch vehicle ascent, staging, and orbital insertion, and data transmit and receive for new satellites completing early orbit checkout. During each Fiscal Year, the SCN supports multiple launches delivering an average of 14B worth of satellites to their operational orbits. Finally, the SCN provides Factory Compatibility Testing (FCT) to ensure satellites and launch vehicles can communicate via the SCN before the satellite is launched.

In FY 2025, the SCN Enhancements and Deficiency Resolution sub-effort funding has been redistributed among the specific activities it supports in the Satellite Operations Transmit and Receive, Satellite C2 Augmentation Services, and Cyber-secure Mission Data Transport areas.

The meshONE-T system, like the SCN ground terminal network, provides an enterprise capability for USSF and other customers. meshONE-T nodes, located at USSF and other mission partner military installations (e.g., USSF and USAF bases), remote sensor, operational, and system development locations, utilize diversified long-haul communication circuits to provide high speed, scalable, resilient, cyber-secure transport services for mission data producers and consumers. These services are operated and managed via geographically dispersed Enterprise Service Desk (ESD) / Network Operation Center (NOC) sites. The multi-tenant, mission-agnostic system uses Commercial Off The Shelf (COTS)-based solutions and industry standard protocols to move data traffic quickly, efficiently, and securely across the Internet Protocol (IP)-based network architecture. The meshONE-T pathfinder, comprised of 20 nodes, long-haul communications links, classified cloud services connections, and an ESD/NOC, provides data transport capabilities for Next-Gen and Future Operationally Resilient Ground Evolution (FORGE) Overhead Persistent Infrared (OPIR) and Advanced Battle Management System (ABMS) mission partners. The post-pathfinder meshONE-T effort will proliferate this modern mission data transport service to additional mission partners and locations—anticipated to include all principal USSF sites—in accordance with warfighter priorities. Supplementary CONUS and

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203110SF / <i>Satellite Control Network (SPACE)</i>
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OCONUS NOCs, communication links, bandwidth upgrades, and system improvements increase global operational reach, resiliency, and responsiveness to support warfighter operations through all phases of conflict. Software-defined networking capabilities accelerate onboarding of new mission partners and the delivery of transport services, providing the agility necessary to counter emerging threats. meshONE-T resolves current space mission network shortfalls including antiquated protocols, bandwidth constraints, lack of resiliency, cyber vulnerability, and excessive fielding times. All mission partners using meshONE-T will become part of the USSF ground network enterprise, with access to every node and network-provided cyber-secure services.

These funds are utilized to meet evolving future space demands for Data Transmit Receive Network (DTRN), to include transmit, receive and data transport to ensure capabilities are available to support DoD, IC, and civil users. This includes efforts to provide more capable ground-based antennas, augment the existing SCN with Federal and commercial antennas to both diversify space-ground link resources and increase capacity for spacecraft communication, modernize satellite scheduling, and develop infrastructure network solutions for long-haul terrestrial communications compatible with Air Force and Space Force missions. Other activities include identifying shared/common platform, infrastructure and data layer solutions to support open frameworks and architectures across the enterprise ground portfolio. Funds are also used for requirements management, system planning, enterprise analysis and architecture support, Systems Engineering and Integration (SE&I), cyber security, test, system enhancement and deficiency resolution, and system resiliency.

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

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	42.024	86.465	98.398	0.000	98.398
Current President's Budget	38.289	86.465	98.572	0.000	98.572
Total Adjustments	-3.735	0.000	0.174	0.000	0.174
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-2.375	0.000			
• SBIR/STTR Transfer	-1.360	0.000			
• Other Adjustments	0.000	0.000	0.174	0.000	0.174

Change Summary Explanation

FY 2023: -2.375 decrease for higher Space Force priorities.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 1203110SF / <i>Satellite Control Network (SPACE)</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>Title: SCN Enhancements and Deficiency Resolution</p> <p>Description: Provides system enhancements, deficiency resolution, test, cyber security, requirements management, and system architecture support to the SCN utilizing enterprise developed technologies or capabilities, when applicable. Additionally, the SCN is investigating multiple cyber defense tools for integration onto the SCN baseline.</p> <p>FY 2024 Plans: Continue to deliver enhancements and deficiency resolution in fielded SCN systems, to include newly-delivered capabilities such as AFSCN Scheduling Tool (AST) and Federal Augmentation. Address user priorities to support mission needs. Facilitate automation, efficiency and resiliency improvements for SCN and related ground resources. Activities may include, but are not limited to, program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 reduction is due to redistribution to consolidate effort with the specific areas it supports for Satellite Operations Transmit and Receive, Satellite C2 Augmentation Services, and Cyber-secure Mission Data Transport efforts.</p>		5.470	5.705	-
<p>Title: Satellite Operations Transmit and Receive</p> <p>Description: Provides enterprise transmit, receive and resource management solutions to enable continuous satellite operations (SATOPS) from benign to contested, degraded and operationally-denied environments as part of DTRN efforts. Provides updates to SCN legacy system capability shortfalls. These updates include modernization of current scheduling, resource management, and development execution for future integrated and automated resource management and scheduling services. Additionally, the SCN will integrate with multiple enterprise cyber defense tools as part of the baseline.</p> <p>FY 2024 Plans: Continue the phased modernization of capabilities supporting satellite operations transmit and receive for both the current and evolving future demand. Adapt as necessary to address user priorities to responsively support mission needs. Advance the Enterprise Resource Manager (ERM) contract beyond initial capability demonstration to full system development for ground resource integration, management, and automation. Provide pre-operations support for AST. Implement necessary studies to identify shared platform, infrastructure, and data layer solutions that will inform future concepts and activities in support of enterprise open frameworks and architectures as well as risk reduction activities, technical analysis for common platform, infrastructure and data layers for ground and communication systems to build upon. Activities may include, but are not limited to, program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p>FY 2025 Plans: Continue the phased modernization of capabilities supporting satellite operations transmit and receive for both the current and evolving future demand. Adapt as necessary to address user priorities to responsively support mission needs. Continue</p>		11.849	19.503	20.311

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 1203110SF / <i>Satellite Control Network (SPACE)</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>foundational ERM system development efforts, iteratively maturing the design to assure ground resource integration, management, and automation. Continue to deliver enhancements and deficiency resolution for Satellite Operations Transmit and Receive efforts. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increase is due to addition of a portion of funds reallocated from the SCN Enhancements and Deficiency Resolution major thrust specific to this effort.</p>				
<p>Title: Satellite C2 Augmentation Services</p> <p>Description: Provides both Federal and commercial satellite C2 services to augment SCN capabilities. Augmented services are planned to be deployed in a phased approach to address early integration and security concerns while providing increased C2 diversity and capacity to reduce the risk of congestion on the SCN.</p> <p>FY 2024 Plans: Continue augmentation services activities. Support initial operations of the Federal Augmentation capability. Continue pursuit of commercial augmentation solutions. Continue on-boarding and support to missions utilizing commercial C2 services. Continue development work for integration of augmentation services into ERM. Continue to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to, program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p>FY 2025 Plans: Continue development and modernization of augmentation services, including integration of services into ERM, and implementation of system resiliency and situational awareness necessary to operate in the contested space domain. Support the final year of initial operations of the Federal Augmentation capability. Continue pursuit of commercial augmentation solutions. On-board missions to utilize augmentation as prescribed by user-driven need. Continue to deliver enhancements and deficiency resolution for Satellite C2 Augmentation Services efforts.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased due to the addition of a portion of funds reallocated from the SCN Enhancements and Deficiency Resolution major thrust.</p>		13.748	27.276	27.978
<p>Title: Cyber-secure Mission Data Transport</p> <p>Description: Provides a scalable, resilient, cyber-secure network communications architecture and infrastructure delivering intelligent, enterprise data and information transport for execution of warfighting functions. Supports worldwide ground</p>		0.000	26.700	42.102

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203110SF / <i>Satellite Control Network (SPACE)</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>communications transport for USSF, other DoD Services, Intelligence Community, and Joint All-Domain Command and Control by fielding an industry standards-based mission data network featuring interoperability, cyber security (to include Zero Trust networking), cloud connectivity and multidomain facilitation. Addresses validated adversarial threats, legacy system obsolescence, bandwidth constraints, stovepipes and cost inefficiency.</p> <p>FY 2024 Plans: Initiate development of the post-prototype meshONE-T system to deliver a modern, scalable, resilient, cyber-secure network communications architecture for mission data transport. Release the request for proposal and award the contract for post-prototype network development, integration, and fielding. Commence deployment of new network nodes to support warfighter-prioritized mission partners and locations. Initiate system enhancements to improve timely, secure movement of data between USSF systems and downstream warfighting service elements, improve resiliency and extensibility, efficiently connect data producers and consumers, and close capability gaps. Perform pre-operations support for existing meshONE-T network mission partners and users.</p> <p>FY 2025 Plans: Execute the initial full year of development, integration, and fielding, following FY 2024 contract award. Continue development of the meshONE-T system to deliver a modern, scalable, resilient, cyber-secure network communications architecture for mission data transport. Continue deployment of new capabilities and upgrades, new network nodes, and communication to support warfighter-prioritized mission partners and locations. Continue to deliver enhancements and deficiency resolution for Cyber-secure Mission Data Transport efforts, and improve timely, secure movement of data between USSF systems and downstream warfighting service elements, improve resiliency and extensibility, efficiently connect data producers and consumers, and close capability gaps. Perform pre-operations support for existing meshONE-T network mission partners and users. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increase is due to ramp up of engineering and integration support for MeshONE-T Cyber-secure Mission Data Transport efforts.</p>			
<p>Title: Enterprise Systems Engineering and Integration (SE&I)</p> <p>Description: SE&I manages the government-controlled system and subsystem level baseline requirements including analysis of future changes to the fielded baseline. SE&I provides "government as the integrator" engineering support to ensure multiple separate modernizations and the sustainment baselines are synchronized. SE&I will develop and recommend investment strategies to keep the SCN operating into the future.</p>	7.222	7.281	8.181

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203110SF / <i>Satellite Control Network (SPACE)</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p><i>FY 2024 Plans:</i> Continue Program Office support and SE&I efforts as required for integration, development and modernization across data transmit, receive and transport capabilities. Provide systems and subsystem level definition, baseline, architecture, integration planning, test, and support for the SCN and augmentation services. Additionally, SE&I will provide support to SSC initiatives supporting DTRN activities. Continue to support implementation of system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to, program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p><i>FY 2025 Plans:</i> Continue Program Office support and SE&I efforts as required for integration, development and modernization across data transmit, receive and transport capabilities. Provide systems and subsystem level definition, baseline, architecture, integration planning, test, and support for the SCN and augmentation services. Additionally, SE&I will provide support to SSC initiatives supporting DTRN activities. Continue to support enhancements and deficiency resolution in fielded SCN systems, to include newly-delivered capabilities, and implementation of system resiliency and situational awareness necessary to operate in the contested space domain.</p> <p><i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> FY 2025 increase is due to ramp up of SE&I necessary to support the simultaneous SatOps Transmit and Receive, C2 Augmentation, and Cyber-secure Mission Data Transport efforts.</p>			
Accomplishments/Planned Programs Subtotals	38.289	86.465	98.572

D. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2025</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>FY 2029</u>	<u>Cost To</u>	<u>Total Cost</u>
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	
• SPAF 01 1203110F: <i>Satellite Control Network (SPACE)</i>	44.583	64.345	65.656	-	65.656	66.612	55.001	56.161	57.289	Continuing	Continuing

Remarks
 N/A

E. Acquisition Strategy
 DT&E efforts focus on completing upgrades as well as future architectures and studies to ensure the best use of investment funding.

SCN acquisition strategy seeks to modernize satellite C2 network capabilities, DTRN, and data transmit, receive and transport architectures to increase efficiency and resiliency of SATOPS and information mobility operations. The approach addresses warfighter needs for increased satellite contact capacity, cyber security, automated

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity
3620F: *Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development*

R-1 Program Element (Number/Name)
PE 1203110SF / *Satellite Control Network (SPACE)*

resource management and operations, and capability resiliency. Both the ERM (competitive prototype Other Transaction (OT)) and meshONE-T (follow on production OT) efforts will be continuing system development in FY 2025 for contracts awarded in FY 2024. Changes in policy, guidance, cyber-risk concerns, and the user-community effort to establish an updated, validated set of requirements for use of commercial services to augment satellite C2 continue to result in revised plans for acquisition of an objective commercial augmentation capability.

The SE&I contractor maintains the DoD Architecture Framework (DoDAF) architecture and requirements baseline for Government approval and may perform studies to determine Government options. Limited RDT&E will be applied to Product Support Manager contracts when sustaining engineering expertise is needed to finalize Government-approved architectures. Federally Funded Research and Development Center technical depth and breadth will be leveraged to ensure SCN modernization efforts are compatible with mission rules and do not pose a risk to safe and cost-effective satellite contacts.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203110SF / <i>Satellite Control Network (SPACE)</i>	Project (Number/Name) 673276 / <i>Satellite Control Network</i>
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SCN Enhancements and Deficiency Resolution	Various	Various : Colorado Springs, CO	-	5.470	May 2023	4.482	May 2024	-		-		-	0.000	9.952	-
Satellite Ops Transmit and Receive - Scheduling	Various	Various : Colorado Springs, CO	-	7.273	Jan 2023	0.420	Jan 2024	0.236	Jan 2025	-		0.236	Continuing	Continuing	-
Satellite Ops Transmit and Receive - Enterprise Resource Management	C/TBD	TBD : TBD	-	0.000	Jan 2023	12.300	Jan 2024	16.339	Jan 2025	-		16.339	Continuing	Continuing	-
Satellite Commercial Augmentation Services	C/CPFF	Parsons Gov't Svcs Inc : Centreville, VA	-	3.031	Mar 2023	14.543	Mar 2024	9.575	Mar 2025	-		9.575	Continuing	Continuing	-
Satellite Federal Augmentation Services: NOAA	MIPR	NOAA : Hillcrest Heights, MD	-	4.477	Mar 2023	8.316	Mar 2024	11.104	Mar 2025	-		11.104	Continuing	Continuing	-
Satellite Federal Augmentation Services: AFRL (Blue Halo)	C/CPFF	Blue Halo LLC : Albuquerque, NM	-	0.930	Mar 2023	2.960	Mar 2024	2.153	Mar 2025	-		2.153	Continuing	Continuing	-
Cyber-secure Mission Data Transport	TBD	Not specified. : TBD	-	-		22.218	Jun 2024	34.358	Jun 2025	-		34.358	Continuing	Continuing	-
Enterprise Systems Engineering and Integration (SE&I)	SS/CPIF	ENSCO : Colorado Springs, CO	-	7.222	Nov 2022	7.281	Nov 2023	8.181	Nov 2024	-		8.181	Continuing	Continuing	-
Technical Mission Analysis	RO	Aerospace Corp : El Segundo, CA	-	2.314	Jan 2023	2.356	Jan 2024	2.936	Jan 2025	-		2.936	Continuing	Continuing	-
SBIR/STTR	TBD	TBD : TBD	-	-		3.012	May 2024	3.549	May 2025	-		3.549	Continuing	Continuing	-
Subtotal			-	30.717		77.888		88.431		-		88.431	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
FFRDC	RO	Aerospace Corp : El Segundo, CA	-	2.690	Jan 2023	2.943	Jan 2024	3.591	Jan 2025	-		3.591	Continuing	Continuing	-
A&AS	Various	Various : Various	-	4.732	Jan 2023	5.334	Jan 2024	6.250	Jan 2025	-		6.250	Continuing	Continuing	-

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203110SF / <i>Satellite Control Network (SPACE)</i>	Project (Number/Name) 673276 / <i>Satellite Control Network</i>

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>SCN Enhancements and Deficiency Resolution</i>	
SCN Enhancements and Deficiency Resolution	
<i>Satellite Operations Transmit and Receive</i>	
Satellite Operations Transmits and Receive	
<i>Satellite C2 Augmentation Services</i>	
Satellite C2 Augmentation Services	
<i>Cyber-secure Mission Data Transport</i>	
Cyber-secure Mission Data Transport	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203110SF / <i>Satellite Control Network (SPACE)</i>	Project (Number/Name) 673276 / <i>Satellite Control Network</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>SCN Enhancements and Deficiency Resolution</i>				
SCN Enhancements and Deficiency Resolution	1	2023	4	2024
<i>Satellite Operations Transmit and Receive</i>				
Satellite Operations Transmits and Receive	1	2023	4	2029
<i>Satellite C2 Augmentation Services</i>				
Satellite C2 Augmentation Services	1	2023	4	2029
<i>Cyber-secure Mission Data Transport</i>				
Cyber-secure Mission Data Transport	3	2024	4	2029

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 1203154SF I Long Range Kill Chains
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	0.000	243.036	244.121	0.000	244.121	249.481	252.540	252.533	257.514	Continuing	Continuing
671112: <i>Moving Target Indicator</i>	-	0.000	0.450	0.839	0.000	0.839	5.969	8.750	8.518	8.686	Continuing	Continuing
671113: <i>Auxiliary Payloads</i>	-	0.000	242.586	243.282	0.000	243.282	243.512	243.790	244.015	248.828	Continuing	Continuing

A. Mission Description and Budget Item Justification

Space-based Ground Moving Target Indicator (GMTI) system is a new start in FY24 and is an integral part of the DAF's Operational Imperative 3: Achieving Moving Target Engagement at Scale in a Highly Contested Environment. Space-based GMTI system will provide actionable information on adversary surface targets to the warfighter through the Advanced Battle Management System (ABMS) as an integral part of Joint All-Domain Command and Control (JADC2) concept. The USSF is working with the Air Force and the Intelligence Community (IC) in a complementary way to design, develop, and deploy space-based GMTI systems.

The GMTI Program (1203154SF) consists of the Moving Target Indicator Project 671112 and the Auxiliary Payloads Project 671113.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary (\$ in Millions)	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025 Base</u>	<u>FY 2025 OCO</u>	<u>FY 2025 Total</u>
Previous President's Budget	0.000	243.036	243.693	0.000	243.693
Current President's Budget	0.000	243.036	244.121	0.000	244.121
Total Adjustments	0.000	0.000	0.428	0.000	0.428
• 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	0.428	0.000	0.428

Change Summary Explanation

FY 2025: \$0.428M increase for inflation.

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 7					R-1 Program Element (Number/Name) PE 1203154SF / Long Range Kill Chains				Project (Number/Name) 671112 / Moving Target Indicator			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
671112: <i>Moving Target Indicator</i>	-	0.000	0.450	0.839	0.000	0.839	5.969	8.750	8.518	8.686	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The space-based GMTI system will replace a portion of the aging E-8C JSTARS sensing capability, based upon the Space Warfighting Analysis Center's (SWAC's) analysis of alternatives assessment completed in September 2022. Proper funding is critical to ensure this system is in place to support the warfighter before all of the JSTARS aircraft retire. GMTI is not a one-for-one swap for the aging E-8 JSTARS that is about to retire, but rather an evolved weapon system that serves as the next generation moving target indicator for the warfighter. GMTI will be critical to tracking surface targets in Competition, Crisis, and Conflict environments. This will be accomplished from space, instead of from JSTARS aircraft which will not be capable of operating in a contested/non-permissive environment. Space-based GMTI will provide another way to harness data from the space domain and incorporate it into the secure cloud environment underpinning the ABMS to sense, make sense, and act faster than our adversaries. The Department of the Air Force will maximize use of mature commercial technologies in order to accelerate the acquisition timeline and meet the GMTI needs of the warfighter.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Moving Target Indicator	0.000	0.450	0.839
Description: Moving Target Indicator			
FY 2024 Plans: New start for FY24. In FY24, the Moving Target Indicator project will leverage relationship with NRO partner to develop and field GMTI system.			
N/A			
FY 2025 Plans: In FY25, the Moving Target Indicator project will continue to leverage relationship with NRO partner to develop and field GMTI system.			
FY 2024 to FY 2025 Increase/Decrease Statement: Increase is due to both inflation and full year of contract(s) to be awarded in FY24.			
Accomplishments/Planned Programs Subtotals	0.000	0.450	0.839

C. Other Program Funding Summary (\$ in Millions)

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203154SF / Long Range Kill Chains	Project (Number/Name) 671112 / Moving Target Indicator

C. Other Program Funding Summary (\$ in Millions)

Remarks

D. Acquisition Strategy

USSF, partnered with NRO will define roles and responsibilities within Title 10 and Title 50 constraints. USSF will be working with the other services and IC to understand the Joint tactical-level ISR and warfighting/targeting requirements and the best way to meet those requirements. This funding will help provide Management Services to the Program Office.

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203154SF / <i>Long Range Kill Chains</i>	Project (Number/Name) 671112 / <i>Moving Target Indicator</i>
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FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>Moving Target Indicator</i>	
Dev & Field MTI	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203154SF / <i>Long Range Kill Chains</i>	Project (Number/Name) 671112 / <i>Moving Target Indicator</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Moving Target Indicator</i>				
Dev & Field MTI	2	2024	4	2029

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 7					R-1 Program Element (Number/Name) PE 1203154SF / Long Range Kill Chains				Project (Number/Name) 671113 / Auxiliary Payloads			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
671113: <i>Auxiliary Payloads</i>	-	0.000	242.586	243.282	0.000	243.282	243.512	243.790	244.015	248.828	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The space-based GMTI system will replace a portion of the aging E-8C JSTARS sensing capability, based upon the Space Warfighting Analysis Center's (SWAC's) analysis of alternatives assessment completed in September 2022. Proper funding is critical to ensure this system is in place to support the warfighter before all of the JSTARS aircraft retire. GMTI is not a one-for-one swap for the aging E-8 JSTARS that is about to retire, but rather an evolved weapon system that serves as the next generation moving target indicator for the warfighter. GMTI will be critical to tracking surface targets in Competition, Crisis, and Conflict environments. This will be accomplished from space, instead of from JSTARS aircraft which will not be capable of operating in a contested/non-permissive environment. Space-based GMTI will provide another way to harness data from the space domain and incorporate it into the secure cloud environment underpinning the ABMS to sense, make sense, and act faster than our adversaries. The Department of the Air Force will maximize use of mature commercial technologies in order to accelerate the acquisition timeline and meet the GMTI needs of the warfighter.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Auxiliary Payloads	0.000	242.586	243.282
Description: Auxiliary Payloads			
FY 2024 Plans: New start for FY24. In FY24, the Auxiliary Payloads project will leverage relationship with NRO partner to develop and field GMTI system.			
N/A			
FY 2025 Plans: In FY25, the Auxiliary Payloads project will continue to leverage relationship with NRO partner to develop and field GMTI system.			
FY 2024 to FY 2025 Increase/Decrease Statement: The increase in FY25 is due to inflation.			
Accomplishments/Planned Programs Subtotals	0.000	242.586	243.282

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203154SF / <i>Long Range Kill Chains</i>	Project (Number/Name) 671113 / <i>Auxiliary Payloads</i>

D. Acquisition Strategy

USSF, partnered with NRO will define roles and responsibilities within Title 10 and Title 50 constraints. USSF will be working with the other services and IC to understand the Joint tactical-level ISR and warfighting/targeting requirements and the best way to meet those requirements. Additional details will be provided upon request at a different classification level.

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203154SF / <i>Long Range Kill Chains</i>	Project (Number/Name) 671113 / <i>Auxiliary Payloads</i>
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	FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Auxiliary Payload	
Dev & field Aux PL	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203154SF / <i>Long Range Kill Chains</i>	Project (Number/Name) 671113 / <i>Auxiliary Payloads</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Auxiliary Payload</i>				
Dev & field Aux PL	2	2024	4	2029

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 1203165SF I NAVSTAR Global Positioning System (Space and Control Segments)
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	1.062	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.062
67A025: GPS Enterprise Integrator	-	1.062	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.062
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

Detailed information on this effort remains classified and will be provided on a need-to-know basis. Effort ends in FY 2023.

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

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary (\$ in Millions)

	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025 Base</u>	<u>FY 2025 OCO</u>	<u>FY 2025 Total</u>
Previous President's Budget	1.062	0.000	0.000	0.000	0.000
Current President's Budget	1.062	0.000	0.000	0.000	0.000
Total Adjustments	0.000	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	0.000	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

C. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Classified Effort	1.062	0.000	0.000
Description: Implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but not limited to, program office support, studies, technical analysis, experimentation, prototyping, etc.			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203165SF / NAVSTAR <i>Global Positioning System (Space and Control Segments)</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
FY 2024 Plans: N/A			
FY 2025 Plans: N/A			
FY 2024 to FY 2025 Increase/Decrease Statement: N/A			
Accomplishments/Planned Programs Subtotals	1.062	0.000	0.000

D. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

E. Acquisition Strategy

N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203165SF / NAVSTAR Global Positioning System (Space and Control Segments)	Project (Number/Name) 67A025 / GPS Enterprise Integrator

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

NAVSTAR Global Positioning System (Space and Control Segments)	
Classified Effort	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203165SF / NAVSTAR Global Positioning System (Space and Control Segments)	Project (Number/Name) 67A025 / GPS Enterprise Integrator

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
NAVSTAR Global Positioning System (Space and Control Segments)				
Classified Effort	1	2023	4	2023

Note
Classified effort; details will be provided on a need-to-know basis.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203173SF / <i>Space and Missile Test and Evaluation Center</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	4.028	22.039	20.844	0.000	20.844	22.932	23.131	23.685	24.152	Continuing	Continuing
67A014: <i>R&D Space & Missile Operations</i>	-	4.028	22.039	20.844	0.000	20.844	22.932	23.131	23.685	24.152	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Research and Development Space and Missile Operations (RDSMO) program, executed by the Acquisition Delta - Innovation and Prototyping, Space Systems Command at Kirtland Air Force Base (KAFB), NM, conducts Space Vehicle and Ground technology transition, prototype development, Developmental Test and Evaluation (DT&E) and Initial Operational Test and Evaluation (IOT&E). RDSMO develops and evaluates ground systems for prototype experimental, demonstration, and operational satellites within the RDT&E Support Complex (RSC) at KAFB, NM and at Schriever Space Force Base (SSFB), CO. Additionally, this program augments the Space Force Satellite Control Network (SCN) with the Mobile Range Flight (MRF) while prototyping new antenna systems and networking technologies worldwide. The RDSMO program develops, acquires, delivers, integrates, tests, operates and sustains the Multi-Mission Satellite Operations Center (MMSOC) satellite command and control (C2) Ground System Enterprise (GSE) for existing experimental and prototype missions. RDSMO develops, acquires, delivers integrates, tests and operates new tactical space C2 architectures from ground stations (including government, commercial, and a local Kirtland station) through their networks to the RSC. RDSMO then ensures users receive the highest quality data at the required latency in support of USSF, Department of Defense (DoD), and other government mission partners. This program also leads the transfer of approved on-orbit missions to operational command organizations such as Space Operations Command. It performs prototype and technology evaluation for multiple USSF missions to include the Enterprise Ground Services, Space Domain Awareness missions, and other mission areas as required.

The objective of the RDSMO Program is to innovate, prototype, and evaluate USSF ground systems to support USSF, DoD, and other government mission partners while speeding transition of war-winning capabilities. The program is centered at the RSC in KAFB, but is developing, testing and evaluating architectures with distributed cloud based operations, integration in existing and future USSF data distribution networks as well as evaluating resiliency and availability to meet future warfighter needs. RDSMO develops and integrates new space technologies to maximize operator usability, such as refining software operator interfaces and developing and evaluating novel Tactics, Techniques and Procedures (TTP). The RDSMO program provides beneficial ground and space vehicle technology directly to the warfighting organizations, for continued experimentation or operations. RDSMO uses a combination of standard hardware and software to:

- (1) perform satellite C2 in support of launch and on-orbit requirements;
- (2) develop TTP to conduct satellite operations;
- (3) provide a satellite C2 incremental or revolutionary (as required) ground resource for RDT&E of new satellite and C2 systems and concepts;
- (4) deliver operational flexibility for new and legacy satellite missions designed to out-pace adversary on-orbit systems;.
- (5) maximize flexible satellite operations to support multi-mission prototype operations to move to cloud-based systems;
- (6) explore and implement innovative ground automation, C2, and data dissemination in concert with experimental, demonstration and prototype space missions;

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203173SF / <i>Space and Missile Test and Evaluation Center</i>
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- (7) ensure a stable and reliable C2 and ground baseline as necessary for experiment and prototype space missions;
- (8) provide an environment to mature technology for developmental satellites and payloads;
- (9) transition and provide best practices for satellites and ground systems to operational squadrons if necessary.

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

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	4.157	22.039	22.408	0.000	22.408
Current President's Budget	4.028	22.039	20.844	0.000	20.844
Total Adjustments	-0.129	0.000	-1.564	0.000	-1.564
• 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	-0.129	0.000			
• Other Adjustments	0.000	0.000	-1.564	0.000	-1.564

Change Summary Explanation

FY 2025 funding decreased compared to the previous President's Budget due to higher Space Force priorities.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
Title: MMSOC Development	4.028	4.640	3.297
Description: Evolution of the Ground Services Architecture (GSA) through the on-premises hardware-based Multi-Mission Satellite Operations Center (MMSOC). Development, integration, and test of common services for space vehicle prototype and operational capabilities, including shared orbital analysis and mission planning tools, data distribution and dissemination, cyber defense, on-premises cloud computing, multi-security level operations, and enhanced ground entry points for prototype-operations. This primarily includes development and evaluation of local hardware solutions as required for space experiment and prototype requirements including both security, resiliency and availability where other cloud-based solutions will not work.			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203173SF / <i>Space and Missile Test and Evaluation Center</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
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FY 2024 Plans:
 Continue to investigate then develop a separate enclave that provides data separation, encryption and logical segregation, with minimal hardware separation as required by the experiment and prototype space mission needs. Continue to improve the operation of existing and planned prototype missions that will inform new acquisitions and improve USSF's ground systems transition for the most cyber-secure posture possible.

Begin to develop cyber resiliency strategies and evaluate effects and trades between on-premises vs cloud-based architectures. Partner with AFRL and others to speed technology transition of ground system capabilities from experimental to prototype phases.

Continue to develop and deliver ground solutions and support for prototype, demonstration, and experimental missions, including but not limited to the Long Duration Propulsive Evolved Expendable Launch Vehicle Secondary Payload Adapter (LDPE)-1 and LDPE-2 missions.

Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities include, but are not limited to, program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.

FY 2025 Plans:
 Continue to evolve hardware, on-premises based MMSOC XPro architectures for full cybersecurity compliance (PKI, 2 Factor Authentication, out of band management) and ensure reliable and resilient development and evaluation to meet "on-premises" requirements. Continue to investigate then develop a separate enclave that provides data separation, encryption and logical segregation, with minimal hardware separation as required by the experiment and prototype space mission needs. Continue to improve the operation of existing and planned prototype missions that will inform new acquisitions and improve USSF's ground systems transition for the most cyber-secure posture possible.

Continue to develop cyber resiliency strategies and evaluate effects and trades between on-premises vs cloud-based architectures. Partner with AFRL and others to speed technology transition of ground system capabilities from experimental to prototype phases.

Continue to develop and deliver ground solutions and support for prototype, demonstration, and experimental missions.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203173SF / <i>Space and Missile Test and Evaluation Center</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
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Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.			
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FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to transition of missions from legacy hardware-based enclave to a cloud-enabled ground system.			
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Title: Cloud-Enabled Ground System Development	0.000	9.099	9.552
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Description: Evaluate, develop, integrate, test and operate cloud-based space C2 capability that will transform the RSC into a more modular solution for space prototype missions, by enabling the handling and distributing mission data at multiple security levels, resolving a current capability gap on payload mission data. Primary goals of this effort will be to measure cost-effectiveness, reliability, cyber resiliency, and mission-effectiveness for upcoming technology transitions. Coordinating with mission partners and AFRL to ensure technology transition evaluation is performed as efficiently as possible. Fully transition existing and future space experiment and prototype missions to an off-premises architecture while ensuring minimal risk to space mission support.			
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FY 2024 Plans: Begin to develop, field, and evaluate cloud-based space mission operations using commercially available architectures to increase system reliability, data distribution, and decrease system life cycle costs for future missions consistent with the GSA. Begin to prototype and demonstrate a modernized cloud-based off-premises GSA solution and follow-on EGS capabilities, to include critical technology maturation of new mission on-boarding solutions, the stand-up of integration and test environments, enabling of data distribution at multiple security levels, transition to a cloud service provider, and stand-up of shared EGS services into a combined GSA and EGS architecture. Develop, integrate and evaluate trades and implementations between hybrid (on-premises and cloud-based solutions) to determine the most cost and mission-effective optimization.			
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Continue integrating the prototype operations center with EGS development, including developing the EGS Risk Reduction & Integration Plan for each prototype mission.			
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Continue to develop and deliver ground solutions and support for prototype, demonstration, and experimental missions, including but not limited to the LDPE-3A mission and subsequent Rapid On-Orbit Space Technology Evaluation Ring (ROOSTER) and Tetra 3, 4, & 5 missions.			
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FY 2025 Plans:			
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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 1203173SF / <i>Space and Missile Test and Evaluation Center</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
Continue to develop, field, and evaluate cloud-based space mission operations using commercially available architectures (Nebula) to increase system reliability, data distribution, and decrease system life cycle costs for future missions consistent with the GSA.				
Continue to prototype and demonstrate a modernized cloud-based off-premises GSA solution and Rapid Resilient Command and Control (R2C2) capabilities, to include critical technology maturation of new mission on-boarding solutions, the stand-up of integration and test environments, enabling of data distribution at multiple security levels, transition to a cloud service provider, and stand-up of shared R2C2 architecture. Evaluate trades and implementations between hybrid (on-premises and cloud-based solutions) to determine the most cost- and mission-effective optimization.				
Continue integrating the prototype operations center with R2C2 development, including developing a Risk-Reduction & Integration Plan for each prototype mission.				
Continue to develop and deliver ground solutions and support for prototype, demonstration, and experimental missions, including but not limited to the ROOSTER and Tetra 3, 4, & 5 missions.				
FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased due to transitioning away from legacy hardware-based ground systems and expansion of cloud-based solutions and integration with experimental/prototype mission operations.				
Title: Prototype Baseline Support		0.000	8.300	7.995
Description: Develops expanded use of automated mission planning tools, data distribution and dissemination and cyber-defense.				
Purchase hardware and software as needed to maintain and advance experiment and prototype operations including: mission planning, ground equipment configuration, real-time satellite commanding, telemetry processing, mission data & cyber-defense.				
FY 2024 Plans: Continue to develop automated mission planning tools to decrease the requirement for additional manpower to fly the satellites, thereby decreasing the total cost to operate the anticipated 20+ experimental and prototype satellite missions.				
Use Federally-Funded Research and Development Contractor (FFRDC), Systems Engineering and Technical Assistance (SETA), and/or University Affiliated Research Center (UARC) support to develop and evaluate TTP across on- and off-premises systems.				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 1203173SF / <i>Space and Missile Test and Evaluation Center</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>Monitor, develop, and mitigate cyber risks. Ensure cyber accreditations to receive approval to operate (ATO), and coordinate cyber-defense capabilities.</p> <p>Develop and integrate ground antenna system capabilities for USSF mission needs. Update and include full networked integration of KAFB antenna assets, enhance needs for energy sustainability and portability of ground system support, and develop, integrate and evaluate cost-effective sustainment methodologies for hardware-based systems.</p> <p>Continue to develop and deliver ground solutions and support for prototype, demonstration, and experimental missions, including but not limited to: the Air Force Vanguard Navigation Technology Satellite-3 (NTS-3), and the two QZSS payloads hosted on Japanese satellites. As part of this, develop TTPs for next-generation USSF satellites.</p> <p>Provide for necessary infrastructure needs to perform system operations and continue evolution of system capabilities both for off- and on-premise architectures.</p> <p>FY 2025 Plans: Continue to develop automated mission planning tools to decrease the requirement for additional manpower to fly the satellites, thereby decreasing the total cost to operate the anticipated 20+ experimental and prototype satellite missions.</p> <p>Use FFRDC, SETA, and/or UARC support to develop and evaluate TTP procedures across on- and off-premises systems.</p> <p>Monitor, develop, and mitigate cyber risks. Ensure cyber accreditations to receive approval to operate (ATO), and coordinate cyber-defense capabilities.</p> <p>Develop and integrate ground antenna system capabilities for USSF mission needs. Integrate a cloud-based antenna as a service (AaaS) capability. Update and include full networked integration of KAFB antenna assets, enhance energy sustainability and portability of ground system support, and develop, integrate and evaluate cost-effective sustainment methodologies for hardware-based systems. Develop and integrate ground antenna system capabilities at the Mobile Range Flight (MRF).</p> <p>Continue to develop and deliver TTPs for next-generation USSF satellites.</p> <p>Provide for necessary infrastructure needs to perform system operations and continue evolution of system capabilities both for off- and on-premises architectures.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement:</p>				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203173SF / <i>Space and Missile Test and Evaluation Center</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
FY 2025 decreased due to the planned completion of ground solutions and support for NTS-3 and QZSS.			
Accomplishments/Planned Programs Subtotals	4.028	22.039	20.844

D. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2023	FY 2024	FY 2025	FY 2025	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
• SPAF 01 GNRLIT: <i>General Information Tech - Space</i>	2.046	0.000	0.000	-	0.000	0.000	0.000	0.000	-	0.000	2.046

Remarks

E. Acquisition Strategy
RDSMO will continue to use the competitively awarded Engineering, Development, Integration, and Sustainment (EDIS) contract (awarded Feb 2020) to support the development and evaluation of ground systems for prototype, experimental, demonstration, and operational satellites. RDSMO will continue to use the competitively awarded Prototype Operations (POPS)-I contract (awarded May 2022) for prototype operations support and concept development activities. RDSMO will use existing mission partner contracts to leverage cost savings or technological efficiencies, including R2C2 contracts, partnerships with AFRL (including UARC support through the Space & Nuclear Advanced Prototypes/Experiments/Tech (SNAPET) contract), and other mission partners. Acquisition strategies will be developed to determine the need for additional contracts to meet the full system requirements, and new contracts may be required as development plans evolve. Additionally, RDSMO uses an SSC Advisory & Assistance Support (A&AS) contract (SSC Acquisition and Finance Support (SAFS)-II and its follow-on SAFS-III), and an SSC SETA contract SSC Technical Support-III (STS-III), as well as FFRDC support through Aerospace.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203173SF / <i>Space and Missile Test and Evaluation Center</i>	Project (Number/Name) 67A014 / <i>R&D Space & Missile Operations</i>
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Ground Services R&D Engineering, Development, Integration, and Test	C/CPAF	SAIC : Albuquerque, NM	-	2.012	Nov 2022	9.316	Nov 2023	6.359	Nov 2024	-		6.359	Continuing	Continuing	-
EGS and Mission Partner Integration Support	Various	TBD : TBD	-	-		1.425	Feb 2024	2.734	Feb 2025	-		2.734	Continuing	Continuing	-
UARC - Space & Nuclear Advanced Prototypes/ Experiments/Tech (SNAPET) Contract (through AFRL)	SS/CPFF	Space Dynamics Laboratory : Logan, UT	-	-		3.380	Feb 2024	3.989	Feb 2025	-		3.989	Continuing	Continuing	-
SBIR/STTR	Allot	TBD : TBD	-	-		0.681	Oct 2023	0.691	Oct 2024	-		0.691	Continuing	Continuing	-
Subtotal			-	2.012		14.802		13.773		-		13.773	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Prototype Operations-I (POPS-I)	C/CPAF	a.i. solutions, Inc. : Kirtland AFB, NM	-	1.324	Oct 2022	1.007	May 2024	0.820	May 2025	-		0.820	Continuing	Continuing	-
Subtotal			-	1.324		1.007		0.820		-		0.820	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
A&AS - STS-III	C/FFP	MEI : Los Angeles, CA	-	0.692	Nov 2022	0.400	Nov 2023	0.400	Nov 2024	-		0.400	Continuing	Continuing	-
A&AS - SAFS-II/SAFS-III	C/FFP	Tecolote : Kirtland AFB, NM	-	-		1.327	Nov 2023	1.364	Nov 2024	-		1.364	Continuing	Continuing	-
FFRDC - Aerospace	RO	Aerospace : Los Angeles, CA	-	-		3.347	Oct 2023	3.330	Oct 2024	-		3.330	Continuing	Continuing	-
Other Support	TBD	TBD : TBD	-	-		1.156	Oct 2023	1.157	Nov 2024	-		1.157	Continuing	Continuing	-

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203173SF / <i>Space and Missile Test and Evaluation Center</i>	Project (Number/Name) 67A014 / <i>R&D Space & Missile Operations</i>

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

MMSOC Development	
Ground Services Architecture (GSA) Evolution (On-Premise Cloud)	
Off-Premises Cloud-Enabled Ground System Development	
Off-Premises Cloud-Enabled Ground System Development and Integration	
Analysis of On- vs. Off-Premises Cloud Enabled Systems	
Off-Premises Development	
Integration of Off-Premises Cloud Enabled Ground Systems	
Prototype R2C2 ACME software with prototype vehicle	
Prototype Baseline Support	
Monitor and coordinate cyber defense capabilities	
Develop and evaluate TTPs	
Develop and integrate ground antenna system capabilities at the Mobile Range Flight (MRF)	
Prototype AaaS through R2C2 Software Factory	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203173SF / <i>Space and Missile Test and Evaluation Center</i>	Project (Number/Name) 67A014 / <i>R&D Space & Missile Operations</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>MMSOC Development</i>				
Ground Services Architecture (GSA) Evolution (On-Premise Cloud)	1	2023	4	2027
<i>Off-Premises Cloud-Enabled Ground System Development</i>				
Off-Premises Cloud-Enabled Ground System Development and Integration	1	2024	4	2029
Analysis of On- vs. Off-Premises Cloud Enabled Systems	1	2024	4	2026
Off-Premises Development	1	2024	4	2026
Integration of Off-Premises Cloud Enabled Ground Systems	1	2024	4	2028
Prototype R2C2 ACME software with prototype vehicle	2	2024	4	2027
<i>Prototype Baseline Support</i>				
Monitor and coordinate cyber defense capabilities	1	2024	4	2029
Develop and evaluate TTPs	1	2024	4	2029
Develop and integrate ground antenna system capabilities at the Mobile Range Flight (MRF)	1	2024	4	2028
Prototype AaaS through R2C2 Software Factory	1	2024	4	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203174SF / <i>Space Innovation, Integration and Rapid Technology Development</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	48.166	41.483	48.900	0.000	48.900	40.330	41.166	42.651	43.492	Continuing	Continuing
674671: <i>Enterprise Training Services Development</i>	-	0.000	31.670	38.866	0.000	38.866	30.058	30.676	31.783	32.410	Continuing	Continuing
67A011: <i>Space Analysis and Application Development</i>	-	48.166	9.813	10.034	0.000	10.034	10.272	10.490	10.868	11.082	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Space Innovation, Integration, and Rapid Technology Development (SIIRTD) program element delivers enterprise capabilities and solutions to help field combat-ready forces and secure space domain superiority in an evolving threat environment.

Enterprise Training Services Development (ETSD) delivers operationally and tactically relevant and realistic enterprise space training capabilities via a system-of-systems architecture to generate, assess, and sustain readiness levels demanded by the current and emerging strategic threat environment in accordance with the USSF Operational Test and Training Infrastructure (OTTI) Strategic Requirements Document (SRD). This architecture includes multi-mission collaborative training systems and platforms; networks; modeling and simulation tools; and training services required to conduct High-End Advanced Test, Training and Tactics (HEAT3) development for the USSF and mission partners representative of combat with potential adversaries.

Space Analysis and Application Development (SA&AD) develops and modifies modeling and simulation tools that USSF/Space Operations Command uses for operational analysis and assessment. Provides operational assessments using analytic rigor to tackle senior leader questions associated with "tonight's" all-domain fight using Combatant Command OPORDS. Leads assessments on space operations, security cooperation activities, and the COMSPACEFOR component space plans while also performing business analytics to develop digital HQ data standards and tools. Development activities incorporate changes in fielded and projected space operational capabilities, as well as technical improvements, into the group's software tools to ensure their data and technology remain current. Operationalize the state of the art in digital tools, modeling, simulation and analysis. These efforts are laying the framework for the Space Force's digital future to include anomaly detection and AI automation and alerts on spacecraft and ops floors across the Service. SIIRTD projects counter known and emerging threats, enable USSF and joint warfighters to realize the full potential of existing and planned space capabilities.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver ETSD and SA&AD training system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 1206392SF and 1206398SF.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203174SF / <i>Space Innovation, Integration and Rapid Technology Development</i>
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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	45.203	41.483	48.815	0.000	48.815
Current President's Budget	48.166	41.483	48.900	0.000	48.900
Total Adjustments	2.963	0.000	0.085	0.000	0.085
• 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	2.963	0.000	0.085	0.000	0.085

Change Summary Explanation

FY 2025: Increase due to inflation rate adjustment.

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 7					R-1 Program Element (Number/Name) PE 1203174SF / <i>Space Innovation, Integration and Rapid Technology Development</i>				Project (Number/Name) 674671 / <i>Enterprise Training Services Development</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
674671: <i>Enterprise Training Services Development</i>	-	0.000	31.670	38.866	0.000	38.866	30.058	30.676	31.783	32.410	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Enterprise Training Services Development (ETSD) builds combat-ready forces by delivering a robust and enduring enterprise training architecture in alignment with the OTTI SRD. ETSD capabilities enable Guardians to train and develop tactics in an operationally relevant environment to achieve and sustain full-spectrum readiness.

Capabilities include:

- high-fidelity mission-specific simulators for readiness and operations training (Unit Training (UT)) and threat/scenario-driven Advanced Training (AT) and tactics development
- high-fidelity threat-representative models of adversary capabilities
- synthetic, physics-based digital environments capable of conducting multi-mission and multi-user full-force distributed training and exercises
- synthetic environment visualizations and friendly/adversary/integrated operational pictures
- networks and Information Technology (IT) infrastructure required to deliver the above capabilities and interoperate with other joint acquisition, test, training, exercise, and exercise infrastructures

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Enterprise Training Services Development	-	31.670	38.866
Description: Enterprise Training Services Development (ETSD) is fundamental to deliver enterprise-wide combat force readiness. The robust, enduring architecture-based capabilities ETSD enables Guardians to train and develop tactics in an operationally relevant environment to achieve and sustain full-spectrum readiness against real-world and emerging/potential threats.			
FY 2024 Plans: Continue to develop and deliver UT/AT systems and capabilities for Missile Warning (Delta 4, Upgraded Early Warning Radar); Space Domain Awareness (Delta 2, Space Fence and Eglin Radar); and Orbital Warfare (Delta 9, 1st Space Operations Squadron); required to assure operational readiness and integrate these missions for interoperable, virtual warfighting exercises. Continue transition from Distributed Mission Operations - Space (DMO-S) to Virtual Space Training and Exercise Environment (VSTEE). Continue efforts to develop and integrate UT/AT systems and capabilities and M&S tools into VSTEE; required for enterprise-wide, interoperable, threat-based training, exercises, and tactics development to 'train like you fight' in a CDO space domain. Modernize UT/AT system hardware; required for the Virtual Space Training Exercise Environment (VSTEE) integration and capability availability. Continue implementing training system resiliency and situational awareness; required to assure training and exercise continuity in a Contested, Degraded, and			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203174SF / <i>Space Innovation, Integration and Rapid Technology Development</i>	Project (Number/Name) 674671 / <i>Enterprise Training Services Development</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>Operationally-Limited (CDO) environment. Efforts may include, but are not limited to, program office support, studies, technical analyses, experimentation, prototyping, etc.</p> <p>FY 2025 Plans: Execute multiple risk reduction activities required by the OTTI Strategic Requirements Document to buy down in advance of an enterprise-wide synthetic environment contract(s) to support High-End Advanced Test, Training, and Tactics (HEAT3) development and readiness generation for the Space Force. Specific risk reduction activities will include: - Prototype cross-domain solution and multi-level security simulation capabilities up to Special Access Programs to allow Guardians at different security levels to train against current and emerging threats. - Integration of training capabilities and M&S tools from multiple vendors into the Virtual Space Training and Exercise Environment (VSTEE) synthetic environment to allow Guardians to use emerging capabilities to train collectively against validated threats. - Accelerate threat model and AI development to allow Guardians to train together against thinking, realistic and responsive threats. - Build space situational awareness simulation capabilities across the Space Force, enabling ability to simulate operations with coalition partners in contested space domain. Continue to develop and deliver high-fidelity mission simulations for mission sets to include Space Domain Awareness and Orbital Warfare mission areas in accordance with Space Operations Command and Space Training and Readiness Command training priorities. This effort will also conduct additional OTTI risk reduction efforts to identify potential materiel solutions to accelerate OTTI capabilities, including high-fidelity mission simulations, cloud computing and network infrastructure these activities will require. Additional activities may include, but are not limited to, program office support, studies, technical analyses, experimentation, prototyping, etc.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increase is due to an increase in requirements to develop mission and threat simulations for space warfighting training, while simultaneously integrating multiple digital environments, and transitioning both legacy and prototype training systems to OTTI architecture.</p>				
Accomplishments/Planned Programs Subtotals		-	31.670	38.866
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203174SF / <i>Space Innovation, Integration and Rapid Technology Development</i>	Project (Number/Name) 674671 / <i>Enterprise Training Services Development</i>

D. Acquisition Strategy
FY24 and 25 activities executed via existing contracts, both competitively awarded and sole sourced (as directed by Small Business Innovative Research Policy Directive, May 2023). These contracts allow for immediate execution of all FY24 and FY25 funds with minimal contracting actions required to ensure continuity of effort across the FYs.

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203174SF / <i>Space Innovation, Integration and Rapid Technology Development</i>	Project (Number/Name) 674671 / <i>Enterprise Training Services Development</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
SIIRTD				
Mission-Specific Simulators	1	2024	4	2029
Threat Models	1	2024	4	2029
Digital Environments and Visualization	1	2024	4	2029
Networks and Training Infrastructure	1	2025	4	2029

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 7					R-1 Program Element (Number/Name) PE 1203174SF / <i>Space Innovation, Integration and Rapid Technology Development</i>				Project (Number/Name) 67A011 / <i>Space Analysis and Application Development</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
67A011: <i>Space Analysis and Application Development</i>	-	48.166	9.813	10.034	0.000	10.034	10.272	10.490	10.868	11.082	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Located at Peterson SFB, Colorado, the Space Innovation, Integration and Rapid Technology Development (SIIRTD) program develops and modifies modeling and simulation tools that USSF/Space Operations Command's Space Analysis Center uses for operations research, military utility analyses, tradeoff studies, and other evaluations of space mission areas to guide planning, programming, requirements generation, analyses of alternatives, and other activities. Development activities incorporate changes in fielded and projected space operational capabilities, as well as technical improvements, into the group's software tools to ensure their data and technology remain current.

Programs and projects in the space warfighting enterprise are evaluating ways to increase innovation and resiliency to known and emerging threats. Space enterprise efforts aim to execute technology risk reduction efforts, integrate new capabilities or repurpose existing capabilities, implement enterprise decision-making tools/ experimentation/rapid prototyping and fielding via all appropriate acquisition authorities and contract mechanisms.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Model/Tool Development and Capability Upgrades	9.581	9.813	10.034
<p>Description: Develops, verifies, and validates models for space mission areas and modifies existing models to portray new capabilities that meet senior leader intent. Advancing Modeling & Simulation (M&S) tools to provide space linkages and impacts to the warfighter as constellations are degraded in a contested environment and incorporate space effects at the campaign, mission and engagement levels with the goal of enhancing decision support, visualization, exercise and wargaming. Rapidly meet downward-directed guidance implementing the system resiliency and situational awareness necessary to win in a contested space domain. Activities may include, but are not limited to, performance assessments of operational units, developing combat analysis and tools supporting operational C2, providing data science solutions supporting tactical acceleration and data driven decisions supporting staff functions. Accelerating space operations and enabling a more lethal force supporting OSD, Joint Staff, Headquarters Air Force, Headquarters United States Space Force, and the USSF Field Commands.</p> <p>FY 2024 Plans: Continue supporting the SpOC field command to develop assessment strategies to assist with deliberate and contingency planning analyzing force structure for the USSF. Also, the funds will support space capability development and space systems delivery as well as strengthen the commander's "fight tonight"</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203174SF / <i>Space Innovation, Integration and Rapid Technology Development</i>	Project (Number/Name) 67A011 / <i>Space Analysis and Application Development</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>strategy with quick-turn senior leader ops assessment. Provides senior leaders with strategic and operational level analysis - converting data into decision quality information. Specifically, funds will support:</p> <ul style="list-style-type: none"> • Support Commander (CC) management (mgt) Headquarters (HQ) and Space Forces Forward (SFFOR) (Operation Order (OPORD direction)) missions; force status to COMSPACEFOR and CDR USSPACECOM • Identifies Space Force "fight tonight" risk in multi-domain warfight using specific scenarios and campaign plans • Developing SpOC and delta metrics as inputs to ops assessments • Campaign modeling initiative response to VCSO "go do"; ensure DoD accurately representing space • Explore and develop AI/ML applications to meet space mission requirements (e.g. Conjunction assessment, satellite maneuver pattern of life) • Develop space analysis tools to improve enterprise accuracy/ efficiency • Reinforce SDA community decisions with comprehensive studies and analysis • Present digital operations to CSO <p>FY 2025 Plans: Continue supporting the SpOC field command to develop assessment strategies to assist with deliberate and contingency planning analyzing force structure for the USSF. Also, the funds will support space capability development and space systems delivery as well as strengthen the commander's "fight tonight" strategy with quick-turn senior leader ops assessment. Provide senior leaders with strategic and operational level analysis-converting data into decision quality information. Specifically, funds will support:</p> <ul style="list-style-type: none"> • Deploy COMSPACEFOR tool - Integrate into major theater exercise and operations to provide SpOC/CC and CCMDs with status of space forces near real time • Explore and develop AI/ML applications to meet space mission requirements (e.g. Conjunction assessment, satellite maneuver pattern of life, operator data-driven insights) • Identify areas for investment to allow future capabilities such as, AI/ML exploitation of USSF mission data • Develop and implement anomalous satellite maneuver classification and prediction algorithm • Operationalize the state of the art in digital tools, modeling, simulation and analysis <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increase due to inflation adjustment.</p>				
Title: Standard Space Trainer Development		38.585	0.000	0.000
Description: Develop, evolve, and enhance space training capabilities to meet USSF Operation Test & Training Infrastructure (OTTI) requirements, including: Unit-level Training (UT); threat-based Advanced Training (AT); and interoperable exercise services, including connectivity to Distributed Mission Operations - Space (DMO-S) training networks and Modeling and				

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203174SF / <i>Space Innovation, Integration and Rapid Technology Development</i>	Project (Number/Name) 67A011 / <i>Space Analysis and Application Development</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
Simulation (M&S) tools integration. Plan and execute efforts in accordance with USAF Operational Training Infrastructure (OTI) Flight Plan and STRATCOM Integrated Priority List (IPL) priorities.			
FY 2024 Plans: N/A			
FY 2025 Plans: N/A			
FY 2024 to FY 2025 Increase/Decrease Statement: N/A			
Accomplishments/Planned Programs Subtotals	48.166	9.813	10.034

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025 Base</u>	<u>FY 2025 OCO</u>	<u>FY 2025 Total</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>FY 2029</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• SPAF 01 GNRLIT: <i>General Information Tech - Space</i>	-	-	-	-	-	-	-	-	-		
• SPSF 01 GNRLIT: <i>General Information Tech - Space</i>	0.427	0.434	0.441	-	0.441	0.450	0.462	0.471	-	Continuing	Continuing

Remarks
Funding and content procures equipment for the SIIRTD USSF Virtual Analysis Capability system. Supports space and cyber modeling & analysis using a variety of Linux and Windows based hardware and software suites. Also procures Information Technology (IT) hardware and software infrastructure for the Distributed Communications Architecture for HQ ACC.

D. Acquisition Strategy
Any new project funded in this program will be awarded using competitive procedures to the maximum extent possible.

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203174SF / <i>Space Innovation, Integration and Rapid Technology Development</i>	Project (Number/Name) 67A011 / <i>Space Analysis and Application Development</i>

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

SIIRD	
Model Development/Modification, verification & validation	
Standard Space Trainer Development	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203174SF / <i>Space Innovation, Integration and Rapid Technology Development</i>	Project (Number/Name) 67A011 / <i>Space Analysis and Application Development</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
SIIRTD				
Model Development/Modification, verification & validation	1	2023	4	2029
Standard Space Trainer Development	1	2023	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203182SF / <i>Spacelift Range System (SPACE)</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	11.219	11.175	55.906	0.000	55.906	57.270	58.660	60.251	61.692	Continuing	Continuing
674137: <i>Launch and Test Range System (LTRS) Modernization</i>	-	11.219	11.175	55.906	0.000	55.906	57.270	58.660	60.251	61.692	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Spacelift Range System (SLRS), also known as the Launch and Test Range System (LTRS), provides public safety and assured access to space. LTRS operates at the Eastern Range (ER) at Patrick SFB/Cape Canaveral SFS, FL and the Western Range (WR) at Vandenberg SFB, CA. LTRS provides tracking, telemetry, communications, flight safety, and other capabilities to support launch of national security space (NSS), civil and commercial space payloads, Intercontinental and Sea Launched ballistic missile and missile defense evaluations, and aeronautical and guided weapon tests. LTRS ensures ability to meet the national launch requirement, safely supports the launch cadence of ER/WR launch requirement holders and provides assured access to space for the nation. The ER and WR are designated as Department of Defense Major Range and Test Facility Bases (MRTFB).

LTRS is comprised of 12 subsystems that together provide this capability to the ranges. The Range Safety, Command Destruct, and Positive Control subsystems provide the capability to destroy an errant rocket, if necessary to protect public safety. These subsystems rely on the Telemetry, Radar, and Optics subsystems to provide tracking data. The Weather and Surveillance subsystems allow range operators and customers to determine if conditions are safe for launch. The Communications, Data Handling, and Timing & Sequencing subsystems ensure critical data is expeditiously routed from remote sensors (e.g., radars, optics) to range operators and customers. Finally, the Planning and Scheduling subsystem ensures all assets are available when needed for a launch or test operation. The shift from the LTRS program into the Spaceports of the Future (SOTF) will be accomplished over the coming years through capability transformation.

The Space Force requires RDT&E funds to conduct LTRS Digital Transformation studies, prototype experimentation, and developmental test activities to meet evolving technological requirements. These activities will constitute the shift from Range systems alone, to integrated Spaceports while remaining operational. The Commander's SOTF vision supports the increased launch tempo and volume, while meeting technological demands of the Spaceport customer base. The transformation will entail data capability pathfinding, integrating existing systems to emerging technologies through prototype activities, and development of unique-fit solutions. Specifically, funds will provide engineering analyses for insertion of promising technology, provide opportunity to test Cloud infrastructure and software development strategies to drive state-of-the-art applications into LTRS development, validate pathfinder concepts to meet an accelerating launch capacity and cadence, improve system cyber survivability and resilience, and continue to evaluate promising technology beyond current industry standards. Digital Transformation drives automation and system autonomy into LTRS operations for seamless launch and return operations and accelerates capability to Range users through adoption of modern systems, platforms and processes.

In order to meet these evolving technological requirements and Spaceport of the Future guidance, LTRS will rebalance funding from a predominantly Procurement focused appropriation to a balanced appropriation mix of Procurement and RDT&E funding through FY 2025 and beyond. This realignment of appropriations ensures

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203182SF / <i>Spacelift Range System (SPACE)</i>
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requirements expend against the appropriation most suited for the type of development work required for mission fulfillment. No requirements planned for Procurement obligations will be sacrificed to achieve this shift in funding profile, but a large subset of these requirements to modernize Range Instrumentation and associated services will move to the software acquisition pathway effort as core capabilities.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver LTRS Critical Space Operations capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 1206392SF and 1206398SF.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	11.608	11.175	10.797	0.000	10.797
Current President's Budget	11.219	11.175	55.906	0.000	55.906
Total Adjustments	-0.389	0.000	45.109	0.000	45.109
• 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	-0.389	0.000			
• Other Adjustments	0.000	0.000	45.109	0.000	45.109

Change Summary Explanation

FY 2025: Increase due to realignment of funds to begin fully executing Delta-V and align funding to match execution strategy for requirements enabling Spaceport of the Future.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
Title: Launch and Test Range (LTRS) Software Modernization, called Delta-V	-	-	30.112
Description: Continuation of a permanent modification to the Launch and Test Range System (LTRS) ACAT III-equivalent program baseline, the Delta-V program will execute the USSFs spaceport & test range software and IT infrastructure modernization portfolio. The program will service software and infrastructure requirements for both the Eastern Range (Cape Canaveral SFS, FL) and the Western Range (Vandenberg SFB, CA). "Delta-V", is a reference to a concept in spacecraft flight dynamics symbolizing a change (Delta, symbolized by a Greek letter in engineering and aerodynamics) in speed and direction (Velocity, symbolized by "V") from the current state. As its name suggests, Delta-V aims to continuously improve the quality and			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203182SF / <i>Spacelift Range System (SPACE)</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
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<p>rate of software capability delivery to space launch and test range operations. The two primary thrusts of the program will be to (1) enable the modernization of existing range software & IT infrastructure and (2) to establish and operate a software factory to build/buy and operationally maintain and sustain spaceport and test range software systems.</p> <p>The program was funded initially in FY 2023 and FY 2024 within the LTRS Range Technology Integration Major Thrust area. Total funding in FY 2023 allocated to Delta-V is 1.774M and in FY 2024 planned funding to Delta-V is \$2.600M.</p> <p>Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2025 Plans: Delta-V will build developmental capabilities such as the Continuous Integration/Continuous Delivery (CI/CD) platform, SW development and test environments, Zero Trust pilot program, Spaceport agile software projects and prototypes and mature DevSecOps processes and leverage lessons learned virtualizing legacy LTRS hardware. Delta-V will utilize CI/CD platform and processes to provide engineering solutions, test, and deliver enhanced operational systems to meet National launch capacity and cadence requirements.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2024 funding for Delta-V planning phase activities are in the LTRS Range Technology Integration Major Thrust area. The FY 2025 increase will enable execution phase activities of Delta-V in its own major thrust.</p>			
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<p>Title: Enterprise Systems Engineering and Integration to Support Government-Controlled Baseline</p> <p>Description: SE&I manages the government-controlled system and subsystem level baseline requirements including analysis of future changes to the fielded baseline. SE&I provides "government as the integrator" engineering support to ensure multiple separate modernizations and the sustainment baseline are synchronized. SE&I will develop and recommend investment strategies to keep the Eastern and Western Ranges operating well beyond the FYDP.</p> <p>FY 2024 Plans: Continue to explore promising technology and concepts to add resiliency and agility to the LTRS fielded baseline to meet National launch capacity and cadence requirements envisioned by SOTF. Seek pathfinding and experimentation in Cloud infrastructure and software delivery pipeline concepts to prototype Range operations approaches, which will feed Digital Transformation of LTRS and accelerate capability to Range users through space access industry standard technology and sustain MRTFB capability. Implement system resiliency, survivability, and situational awareness necessary to operate in the contested space</p>	2.240	2.050	9.527
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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 1203182SF / <i>Spacelift Range System (SPACE)</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>domain and address ever-expanding cyber threats. Continuing activities including, but not limited to, program office support, studies, technical analyses, experimentation, prototyping, etc.</p> <p>FY 2025 Plans: Continue to explore promising technology and concepts to add resiliency and agility to the LTRS fielded baseline to meet National launch capacity and cadence requirements envisioned by SOTF. Seek pathfinding and experimentation in Cloud infrastructure and software delivery pipeline concepts to prototype Range operations approaches, which will feed Digital Transformation of LTRS and accelerate capability to Range users through space access industry standard technology and sustain MRTFB capability. Implement system resiliency, survivability, and situational awareness necessary to operate in the contested space domain and address ever-expanding cyber threats. Continuing activities including, but not limited to, program office support, studies, technical analyses, experimentation, prototyping, etc.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased from FY 2024 due to additional support required to support digital transformation efforts and to evenly distribute the cost proportionally between the RDT&E and Procurement appropriations. Increased funding will fully enable execution of the Delta-V Software Acquisition Pathway program.</p>				
<p>Title: LTRS Range Technology Integration</p> <p>Description: Provides Advisory and Assistance Services (A&AS) support of the operational baseline (all twelve subsystems) to include configuration management of all range assets, requirements analyses, and special studies. Provides support for Systems Program Office operations, Systems Engineering and Technical Assistance (SETA), and Federally Funded Research and Development Centers (FFRDC). Strategically executes experimentation, prototyping, risk reduction, and other efforts to develop new or repurpose capabilities.</p> <p>FY 2024 Plans: Continue efforts to analyze, engineer, and prototype SOTF envisioned agility and resiliency through a Digital Transformation strategy via adoption of modern systems, infrastructure, platforms, and processes; includes research associated with Cloud infrastructure and software factory concepts. Development support services will facilitate prototypes and data-driven applications to accelerate capabilities to range users such as agile Range situational awareness and LTRS equipment automation to facilitate rapid range reconfiguration and continued expansion of capability to conduct simultaneous launch operations. Develop and prove Dev/Sec/Ops capability as a viable approach for deploying LTRS system applications and software in a continuous integration/continuous delivery methodology. Implement system resiliency and situational awareness necessary to operate in a contested space and cyber domain. Activities include, but are not limited to, program office support, studies, technical analyses, experimentation, prototyping, etc.</p> <p>FY 2025 Plans:</p>		8.979	9.125	16.267

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203182SF / <i>Spacelift Range System (SPACE)</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
Adopt modern systems, infrastructure, platforms, and processes to transition to an increasingly Cloud-based infrastructure with Cloud-native data governance regimes to sustain future operational data needs. Continue efforts to analyze, engineer, and prototype SOTF envisioned agility and resiliency through a Digital Transformation strategy while upgrading rapid data delivery for decision-support in an increasingly contested operational environment. Transforming Range resiliency and launch customer responsiveness with data and predictive modeling for real-time decision support. Development teams and digital support services will facilitate prototypes and data-driven test applications to accelerate delivery of capabilities to range users. Efforts such as agile Range situational awareness and LTRS equipment automation to facilitate rapid range reconfiguration and continued expansion of capability to conduct simultaneous launch operations towards the SOTF objectives. Harness proven Dev/Sec/Ops approach for deploying LTRS system applications and transitioning legacy data transport for accelerated analysis and mission support. Implement system resiliency and situational awareness necessary to operate in a contested space and cyber domain, while improving operational efficacy through testing and prototyping throughout increased operational use. Activities include, but are not limited to, program office strategy advisement on advanced technology adoption, studies, technical analyses, experimentation, prototyping, etc.			
<i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> FY 2025 increase due to the increased need for spaceport capacity, responsiveness and agility to meet the operational demand signal and prevent them from becoming a constraint to space launch and test through common platform integration, data transport modernization and sensor edge data integration. Increases in FY 2025 will enable additional development activities to provide enterprise support for the Delta-V Software Acquisition Pathway program.			
Accomplishments/Planned Programs Subtotals	11.219	11.175	55.906

D. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
• SPSF 01 1203182SF: <i>Spacelift Range System (Space)</i>	69.275	114.505	63.798	-	63.798	62.448	64.027	65.190	66.251	Continuing	Continuing

Remarks

E. Acquisition Strategy
 The Launch and Test Range System (LTRS) program acquisition strategy is Incremental System Modernization and Digital Transformation to ensure continued enablement of the accelerating National launch cadence executing on the Eastern Range (ER) and Western Range (WR). This strategy addresses the US Space Force (USSF) Spaceport of the Future (SOTF) guidance, formerly known as Range of the Future (ROTF), envisioned by Range instrumentation architecture—one of multiple SOTF lines of effort. The LTRS program is focused on developing a scalable system capable of responding to the demands of National Security Space objectives and DoD test and evaluation needs as well as assuring the Nation's ability to access space. Innovative development and employment of Cloud infrastructure, software

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity
3620F: *Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development*

R-1 Program Element (Number/Name)
PE 1203182SF / *Spacelift Range System (SPACE)*

factory and software development services, and cyber security strategies to facilitate data-driven Spaceport activities, digital processing, and data distribution capability is targeted as the enabling strategy for the SOTF Architectural line of effort. Promising prototypes and technology will be accelerated into the LTRS architecture via investments aimed at inserting on-demand increased operational capacity and state-of-the-practice data formatting and transport to launch operations. Contracted engineering and integration services innovate promising technology into the system technical baseline and manage the LTRS specifications and technical requirements on behalf of the government. Additionally, engineering services act as integrator for completed LTRS modernization projects. Federally Funded Research and Development Center (FFRDC) provides critical mission technical and cyber security analysis capability to ensure LTRS assets meet operational needs.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203182SF / <i>Spacelift Range System (SPACE)</i>	Project (Number/Name) 674137 / <i>Launch and Test Range System (LTRS) Modernization</i>
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Launch and Test Range System (LTRS) Software Modernization, called Delta-V	C/Variou	Various : Various	-	-		-		30.112	Jan 2025	-		30.112	Continuing	Continuing	-
Enterprise Systems Engineering and Integration	C/FPIF	ENSCO INC : Falls Church, VA	-	2.240	Oct 2022	2.050	Oct 2023	9.527	Oct 2024	-		9.527	Continuing	Continuing	-
LTRS Range Technology Integration	C/Variou	Various : Various	-	6.701	May 2023	6.812	May 2024	11.551	May 2025	-		11.551	Continuing	Continuing	-
SBIR/STTR	TBD	TBD : TBD	-	-		0.039	May 2024	2.009	May 2025	-		2.009	Continuing	Continuing	-
Subtotal			-	8.941		8.901		53.199		-		53.199	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
FFRDC	RO	Aerospace : El Segundo, CA	-	0.659	Nov 2022	0.573	Nov 2023	0.591	Nov 2024	-		0.591	Continuing	Continuing	-
OTHER SUPPORT	PO	Various : El Segundo, CA	-	1.619	Nov 2022	1.701	Nov 2023	2.116	Nov 2024	-		2.116	Continuing	Continuing	-
Subtotal			-	2.278		2.274		2.707		-		2.707	Continuing	Continuing	N/A

	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals		-	11.219	11.175	55.906	-	-	55.906	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203182SF / <i>Spacelift Range System (SPACE)</i>	Project (Number/Name) 674137 / <i>Launch and Test Range System (LTRS) Modernization</i>

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

LTRS	
LTRS Software Modernization, Delta-V	
Range Technology Integration	
Enterprise SE&I	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203182SF / <i>Spacelift Range System (SPACE)</i>	Project (Number/Name) 674137 / <i>Launch and Test Range System (LTRS) Modernization</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
LTRS				
LTRS Software Modernization, Delta-V	1	2025	4	2029
Range Technology Integration	1	2023	4	2029
Enterprise SE&I	1	2023	4	2029

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203265SF / <i>GPS III Space Segment</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	16.878	1.467	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	18.345
67A019: <i>GPS III</i>	16.878	1.467	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	18.345
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

Program MDAP/MAIS Code: 292

A. Mission Description and Budget Item Justification

The Global Positioning System (GPS) is a space-based navigation system that fills validated Joint Service requirements for worldwide, accurate, common grid three dimensional positioning/navigation for military aircraft, ships, and ground personnel. The consistent accuracy, unaffected by location or weather and available in real time, significantly improves effectiveness of reconnaissance, weapons delivery, mine countermeasures and rapid deployment for all services. GPS must comply with Title 10 United States Code (USC) Sec. 2281, which requires that the Secretary of Defense ensures the continued sustainment and operation of GPS for military and civilian purposes, and 51 USC Sec. 50112, which requires that GPS complies with certain standards and facilitates international cooperation.

The system is composed of three programs: User Equipment (funded under Program Element (PE) 1203164F, 1203164SF), Space (funded under PE 1203165F, 1203265F, 1203265SF, 1203269F, and 1203269SF), and a Control Network (funded under PE 1206423F, 1206423SF and 1203165F). The satellites broadcast high accuracy data using precisely synchronized signals that are received and processed by user equipment installed in military platforms. The user equipment computes the platform position and velocity and provides steering vectors to target locations or navigation waypoints. The control segment provides daily updates to the navigation messages broadcast from the satellites to maintain system precision in three dimensions to 16 meters (spherical error probable) worldwide. Additionally, GPS supports the United States Nuclear Detonation (NUDET) Detection System (USNDS) mission and provides strategic and tactical support to the following Department of Defense missions: Joint Operations by providing capabilities for Positioning, Navigation, and Timing (PNT); Command, Control, Communications, and Intelligence; Special Operations; Military Operations in Urban Terrain; Defense-Wide Mission Support; Air Mobility; and Space Launch Orbital Support.

GPS III is the next generation of Space Vehicles (SV) supporting the GPS constellation and is funded in PE 1203265SF. GPS III SVs deliver significant enhancements over legacy satellites, including a new international civil (L1C) Galileo-compatible signal, and enhanced anti-jam power. GPS III SVs 07-10 are in the Production and Deployment Phase, with SV 07 launching in FY 2024.

The GPS III program RDT&E funded and supported GPS III SVs 01-02 and risk-reducing simulators through a systems engineering approach that matures and delivers SVs for launch. This included SVs 01-02 engineering studies and analyses, trade studies, system development, test and evaluation efforts, integrated logistics support products, on-orbit support, and mission operations support for civil and military applications that protect U.S. military and allied use of GPS. The program also included Contingency Operations as a bridge capability to fly GPS III SVs until the delivery of the Next Generation Operational Control System (OCX) program.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203265SF / <i>GPS III Space Segment</i>
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Mission Readiness Campaign activities include launch preparation, planning, mission readiness testing to validate space-ground-user interfaces, mission crew exercises and rehearsals, launch vehicle integration, and On-Orbit Checkout activities to validate performance prior to launch and post launch. Newly certified launch vehicles must be incorporated into the GPS III launch baseline. Integration requires the development of plans and procedures and procurement of special support equipment.

GPS supports the early deployment of Global Military-Code (M-Code) to meet a Congressional mandate limiting user equipment purchases to M-Code capable receivers starting in FY 2017. The funds will cover the M-Code Early Use (MCEU) program and support development costs associated with the GPS control segment software to provide core M-Code capabilities to the warfighter, as well as the ability to command and control, process, and monitor the M-Code signal. MCEU mitigates delays with GPS OCX, supports Military GPS User Equipment (MGUE) testing, and allows for early M-Code operations. M-Code provides greater security to protect navigation and timing in electronically contested environments.

- Impacts of the M-Code deployment include:
- Compliance with U.S. Space Command Commander's mandate to provide global monitoring necessary for early M-Code operational use and verification of navigation warfare effects.
 - Improved resiliency of the GPS capability.
 - Confirmation that PNT Enterprise modernization efforts are integrated and properly deployed.
 - Testing and verification of M-Code capability on MGUE/GPS III solution and early M-Code use tied to MGUE fielding.

The feasibility studies and preliminary engineering analyses that were funded by this budget item will determine whether an initiative to host GPS M-Code augmentation payloads on other satellite systems is practical and beneficial. The primary goal is to provide additional mission assurance through redundant systems not directly connected with the current U.S. GPS satellite constellation.

This program encompasses GPS III (SVs 01-10) and MCEU.

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

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 1203265SF I GPS III Space Segment
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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	1.526	0.000	0.000	0.000	0.000
Current President's Budget	1.467	0.000	0.000	0.000	0.000
Total Adjustments	-0.059	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	0.000	0.000			
• Other Adjustments	-0.059	0.000	0.000	0.000	0.000

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
Title: GPS III SVs 01-02	1.467	0.000	0.000
Description: Development, test, and evaluation of GPS III SVs 01-02 and associated simulators, on-orbit engineering, engineering studies and analyses, trade studies, system development, test and evaluation efforts, and integrated logistics support products.			
FY 2024 Plans: N/A			
FY 2025 Plans: N/A			
Accomplishments/Planned Programs Subtotals	1.467	0.000	0.000

D. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
• SPSF 01 GPSIII: GPS III Space Segment	103.340	121.770	68.072	-	68.072	29.665	2.808	0.000	0.000	0.000	325.655

Remarks

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203265SF / <i>GPS III Space Segment</i>	
E. Acquisition Strategy <p>The GPS III next generation space segment (space vehicles (SVs) 01-10) rapidly and affordably responds to warfighter capability requirements. The acquisition approach utilizes a disciplined systems engineering approach which focuses on mitigating cost and schedule risk through a lower-risk incremental delivery of mature technologies. This approach focuses on mission success and on-time delivery. The GPS III SVs will have GPS II Follow-on (IIF) capabilities plus up to a 3x-8x increase in anti-jam signal power, 3x improved accuracy, 3+ year increased design life, a new international civil (L1C) signal compatible with the European Galileo system, and a satellite bus capable of supporting future SV capability additions.</p> <p>On January 21, 2017, Program Executive Officer (PEO) Space approved the Acquisition Strategy for the Military-Code (M-Code) Early Use (MCEU) program. The MCEU acquisition strategy enables the GPS Enterprise to provide core M-Code capabilities to the warfighter prior to GPS OCX delivery. MCEU supports the scheduled operational testing of MGUE. MCEU updated the GPS control segment software, Architecture Evolution Plan (AEP), to allow for command and control, processing, and integrity monitoring of the M-Code signal. MCEU acquires this capability by using the existing GPS III prime contract vehicle to modify the operational AEP software. The Air Force approved reinstatement of a previously deferred Key Support Area (KSA) on February 10, 2016. The Monitor Station Technology Improvement Capability (MSTIC) receivers currently under development will get a software upgrade to process M-Code data. This 7.96M project to procure the M-Code MSTIC receivers was funded through both O&M and SPAF funds in FY 2016-FY 2018. Performance monitoring, integration, and test will be conducted by the MCEU program and sustained under the Global Positioning Operations Support and Sustainment Division contract with Lockheed Martin.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203265SF / GPS III Space Segment	Project (Number/Name) 67A019 / GPS III
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
GPS III Development	C/CPIF	Lockheed Martin : Denver, CO	3.199	1.131	Dec 2022	-		-		-		-	0.000	4.330	-
GPS III SV01-02 On Orbit Incentive Fee	C/CPIF	Lockheed Martin : Denver, CO	1.243	-		-		-		-		-	0.000	1.243	-
GPS III Technical Mission Analysis	RO	Aerospace : El Segundo, CA	1.426	0.000	Mar 2023	-		-		-		-	0.000	1.426	-
GPS III Enterprise SE&I	C/CPAF	SAIC : El Segundo, CA	1.434	0.303	Oct 2022	-		-		-		-	0.000	1.737	-
GPS III Launch Support	RO	45th SV Processing : Cape Canaveral, FL	1.475	-		-		-		-		-	0.000	1.475	-
MCEU Development	C/CPIF	Lockheed Martin : Denver, CO	3.334	-		-		-		-		-	0.000	3.334	-
Subtotal			12.111	1.434		-		-		-		-	0.000	13.545	N/A

Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
GPS III FFRDC	RO	Aerospace : El Segundo, CA	1.592	-		-		-		-		-	0.000	1.592	-
GPS III A&AS	Various	Various : Various	3.175	0.033	Dec 2022	-		-		-		-	0.000	3.208	-
Subtotal			4.767	0.033		-		-		-		-	0.000	4.800	N/A

			Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			16.878	1.467	-	-	-	-	0.000	18.345	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203265SF / <i>GPS III Space Segment</i>	Project (Number/Name) 67A019 / <i>GPS III</i>
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FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

GPS III	
GPS III SV01/02 On-Orbit Engineering Support/Performance Validation	[REDACTED]

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203265SF / <i>GPS III Space Segment</i>	Project (Number/Name) 67A019 / <i>GPS III</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
GPS III				
GPS III SV01/02 On-Orbit Engineering Support/Performance Validation	1	2023	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203330SF / <i>Space Superiority ISR</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	29.128	28.730	28.227	0.000	28.227	24.668	22.086	22.881	23.332	Continuing	Continuing
67A051: <i>Space Superiority - Advanced Intelligence Systems</i>	-	29.128	28.730	28.227	0.000	28.227	24.668	22.086	22.881	23.332	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Space Superiority Intelligence, Surveillance and Reconnaissance (ISR) (SSI) program provides ISR for key find, fix, track, target, engage, and assess requirements supporting Space Superiority activities meeting Combatant Command (CCMD) needs for Space Operations Command (SpOC). SSI funds developmental intelligence activities to support new space superiority capability acquisition and development. Funds associated developmental ISR Planning and direction, Collection, Processing and exploitation, Analysis and production, Dissemination and integration (PCPAD) capabilities providing Battlespace Awareness and Space Domain Awareness (SDA) in support of Space Superiority and Space Control. This includes funding for fixed and transportable intelligence collection; Processing, Exploitation and Dissemination (PED); analysis and production capabilities that are modular (plug-and-play); meet Risk Management Framework Accreditation requirements and can keep pace with technological advances and emerging threats. It provides intelligence support systems for SDA activities that provide the requisite current and predictive knowledge of space events and threat conditions and intelligence support to the Space Security and Defense Program (SSDP) by providing architectural survivability analysis of critical mission assets for mission assurance, as well as network analysis. It also supports specialized/tailored, phased threat system analysis and studies (A&S), test support, lab equipment, and Material Acquisition and Exploitation (MAE) for system development, vulnerability, susceptibility assessments to support tactics, techniques and procedures (TTP) development, and future threat technology studies necessary for mission area success, achievement of space superiority, and to preserve the US space advantage across all domains.

Space acquisition must respond with speed and agility to the proliferation of emerging space adversary threats and new technologies. In support of these nascent, cutting edge space acquisition capabilities, Space Superiority ISR provides exquisite, crucial cryptologic and ISR through transformational collection and production activities through the rapid development and fielding of fixed and transportable intelligence architectures capable of front-end collection and analysis of new technologies in near real time. Space Superiority and Space Control is only realized through Space Superiority ISR support on the front end of space acquisition, allowing increased innovation and resiliency in support of changing program/project priorities to respond and to operate in the contested space domain, as well as supporting lifecycle experimentation, prototyping, and risk reduction.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development	R-1 Program Element (Number/Name) PE 1203330SF / Space Superiority ISR
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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	29.128	28.730	28.777	0.000	28.777
Current President's Budget	29.128	28.730	28.227	0.000	28.227
Total Adjustments	0.000	0.000	-0.550	0.000	-0.550
• 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	-0.550	0.000	-0.550

Change Summary Explanation

FY 2025: The FY 2025 funding request was reduced by \$0.550 million to account for the availability of prior year execution balances.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
Title: Advanced Intelligence Systems for Space Superiority	29.128	28.730	28.227
Description: Develops transportable and fixed PCPAD capabilities.			
FY 2024 Plans: Funding completes the deliveries of the remaining large antennas to SSI Enterprise sites under the multi-year capability delivery task order. Continues development of mission management planning enhancements and robust collection automation capability. Focuses on PED of ISR Enterprise data via automation, artificial intelligence, high speed connectivity and digital processing through the multiple phases of the ISR mission. Delivers additional antenna refurbishments and upgrades to 73 ISR Squadron's OCONUS locations; includes delivery, site integration, Requirements Management Framework (RMF), Authority to Operate (ATO), and testing of systems. Provides ISR processing capability updates, and automated mission management to 72 ISR Squadron, Peterson SFB, CO in support of Continental United States (CONUS)-based deployable Tactical ISR Operations Cells (TISROCs)/Deployable ISR Support Cells (DISCs) to meet USSF Service-retained and CCMD ISR requirements. Implements a Radio Frequency (RF) search and survey tool enhancement. Expands Long Haul Communications bandwidth and connects new units. Continues funding for analytic exploitation, vulnerability and susceptibility tools enhancements. Supports Space ISR Cell and associated Space ISR Roadmap requirements, material solutions analysis and other functions for development and fielding SDA capabilities, including a Data Management System to archive and make mission data discoverable, an ISR exploitation tool suite, and cross-domain data dissemination to CCMDs, IC and National Agencies.			
FY 2025 Plans:			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203330SF / <i>Space Superiority ISR</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Will continue the development/delivery of fixed collection capabilities for 73 ISR Squadron. Begins complete transformation of Space ISR deployable capabilities through initiation of multi-year, collection capability refresh for 72 ISRS, Peterson SFB, CO in support of Continental United States (CONUS)-based deployable Tactical ISR Operations Cells (TISROCs)/Deployable ISR Support Cells (DISCs) to meet USSF Service-retained and CCMD ISR requirements. Completes development, installation, and Authority to Operate (ATO) of mission management planning enhancements and robust collection automation capability. Continues enhancement of fixed/mobile ISR Processing, Exploitation and Dissemination (PED) capabilities via latest hardware/software technology, automation, artificial intelligence, high speed connectivity and digital processing. Instantiates a Radio Frequency search and survey tool enhancement. Continues enhancements to data dissemination capabilities. Continues funding for updates to analytic exploitation, vulnerability and susceptibility tools. Second year of FY24 RDT&E funding, in FY25, also supports multi-INT Space ISR PED Cell (SIPC) fused intelligence for ISR operations in support of operations; development of operational techniques, tactics, and procedures (TTPs) development and associated Space ISR Roadmap requirements, material solutions analysis and other functions for development and fielding Space Domain Awareness (SDA) capabilities, including a Data Management System to archive and make mission data discoverable, a ISR exploitation tool suite, and cross-domain data dissemination to CCMDs, IC and National Agencies.</p> <p><i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> FY25 decreased due to inflation rate adjustments.</p>			
Accomplishments/Planned Programs Subtotals	29.128	28.730	28.227

D. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

E. Acquisition Strategy
All contracts funded in this program will be awarded using competitive procedures to the maximum extent possible.

Space Superiority and R&D Intelligence Development: Single Delivery, Cost-Plus-Fixed-Fee (CPFF), advisory and assistance contractor supporting development and implementation efforts, such as engineering architectural development and planning and Requirements Management Framework (RMF) certifications to operate. Prime contractor is HII.

Architecture upgrades to SDA, SSDP, and Space Superiority: Multiple Delivery, CPFF integration contract for acquiring, integration, installation and testing of ISR collection assets. Prime contractor is CACI/BITSYSTEMS Data Analysis.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203330SF / <i>Space Superiority ISR</i>	
Data Analysis, Production Development, Test Support for R&D: Multiple Delivery, CPFF production contract supporting vulnerabilities analysis of ISR collected material. Prime Contractor is Booz-Allen Hamilton		
ISR Cell for Data Management Archiving, Exploitation and Dissemination: TBD Multiple Delivery, CPFF integration contract providing Data Management System, Exploitation Tool Suites and Cross-Domain Data Dissemination Solution new capability development. Prime contractor is Various (Tyto, AT&T, PRKK, & MITRE) in FY 2024.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203330SF / <i>Space Superiority ISR</i>	Project (Number/Name) 67A051 / <i>Space Superiority - Advanced Intelligence Systems</i>
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Space Superiority and R&D Intelligence Development	C/CPFF	Various: TBD : TBD	-	1.500	Nov 2022	1.470	Nov 2023	1.770	Nov 2024	-		1.770	Continuing	Continuing	-
Architecture Upgrades to SDA, SSDP, and Space Superiority	C/CPFF	Various: TBD : TBD	-	18.359	Dec 2022	17.306	Dec 2023	20.803	Dec 2024	-		20.803	Continuing	Continuing	-
Data Analysis, Product Development & Test Support for R&D	C/CPFF	Various: TBD : TBD	-	4.601	Nov 2022	6.298	Nov 2023	5.422	Nov 2024	-		5.422	Continuing	Continuing	-
Space ISR PED Cell (SIPC) for Data Management Archiving, Exploitation and Dissemination	C/CPFF	Various: TBD : TBD	-	4.444	Jan 2023	3.432	Jan 2024	0.000		-		0.000	Continuing	Continuing	-
Subtotal			-	28.904		28.506		27.995		-		27.995	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Mission Support	C/Various	TBD : TBD	-	0.224	Oct 2022	0.224	Oct 2023	0.232	Oct 2024	-		0.232	Continuing	Continuing	-
Subtotal			-	0.224		0.224		0.232		-		0.232	Continuing	Continuing	N/A

			Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	29.128	28.730	28.227	-	28.227	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203330SF / <i>Space Superiority ISR</i>	Project (Number/Name) 67A051 / <i>Space Superiority - Advanced Intelligence Systems</i>

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Space Superiority ISR	
Space Superiority and R&D Intelligence Development	
Architecture Upgrades to SDA, SSDP, and Space Superiority	
Data Analysis, Production Development and Test Support for R&D	
Space ISR PED Cell (SIPC) for Data Management Archiving, Exploitation and Dissemination	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203330SF / <i>Space Superiority ISR</i>	Project (Number/Name) 67A051 / <i>Space Superiority - Advanced Intelligence Systems</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Space Superiority ISR</i>				
Space Superiority and R&D Intelligence Development	1	2023	4	2029
Architecture Upgrades to SDA, SSDP, and Space Superiority	1	2023	4	2029
Data Analysis, Production Development and Test Support for R&D	1	2023	4	2029
Space ISR PED Cell (SIPC) for Data Management Archiving, Exploitation and Dissemination	2	2023	4	2025

Note

Note that SIPC is not slated to receive FY25 RDT&E funds; Second year FY24 RDT&E funds will be used in FY25.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203620SF / <i>National Space Defense Center</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	2.659	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.659
670004: <i>OTHER STRATCOM ACTIVITIES</i>	-	2.659	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.659
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program develops and integrates Battle Management and Command and Control (BMC2) applications for the Joint Task Force - Space Defense (JTF-SD). JTF-SD is one of two subordinate commands to USSPACECOM and has the responsibility to protect and defend space assets from both terrestrial and space-based threats. The JTF-SD executes its mission through its operations center, the National Space Defense Center (NSDC) which was previously referred to as the Joint Interagency Combined Space Operations Center. NSDC efforts include integrating hardware and software prototypes to support various networks developed by mission partners and integrating applications developed by the Space C2 program to ensure relevant and accurate situational awareness to mission partners. NSDC also conducts early prototyping efforts to inform JTF-SD's ability to generate informed BMC2 and space superiority requirements for the acquisition community. The JTF-SD (and NSDC) allows the national security space community to effectively respond to space threat events and will have the capability to develop, test, and integrate new space system tactics, techniques and procedures (TTPs) in support of both DoD and Intelligence Community operations.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	2.659	0.000	0.000	0.000	0.000
Current President's Budget	2.659	0.000	0.000	0.000	0.000
Total Adjustments	0.000	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	0.000	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203620SF / <i>National Space Defense Center</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
Title: Application Development Description: Develop and field Space Battle Management Command and Control capabilities. FY 2024 Plans: N/A FY 2025 Plans: N/A	2.659	0.000	0.000
Accomplishments/Planned Programs Subtotals	2.659	0.000	0.000

D. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

E. Acquisition Strategy

NSDC provides funds to Department of the Air Force, DoD, and other partner organizations to execute on their contracts in support of NSDC requirements. Additionally, NSDC funding secures contract support to develop and document the technical baseline and support major test and transition activities during each fiscal year.

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203620SF / <i>National Space Defense C</i> <i>enter</i>	Project (Number/Name) 670004 / <i>OTHER STRATCOM ACTIVITIES</i>

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

NSDC INFRASTRUCTURE	
SUSTAINMENT/SUPPORT	██████████
BMC2 APPLICATION DEVELOPMENT AND INTEGRATION	
APPLICATION DEVELOPMENT	██████████

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203620SF / <i>National Space Defense Center</i>	Project (Number/Name) 670004 / <i>OTHER STRATCOM ACTIVITIES</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>NSDC INFRASTRUCTURE</i>				
SUSTAINMENT/SUPPORT	1	2023	4	2023
<i>BMC2 APPLICATION DEVELOPMENT AND INTEGRATION</i>				
APPLICATION DEVELOPMENT	1	2023	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203873SF / <i>Ballistic Missile Defense Radars</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	23.194	20.752	12.024	0.000	12.024	0.000	0.000	0.000	0.000	0.000	55.970
674820: <i>Sensor Development</i>	-	23.194	20.752	12.024	0.000	12.024	0.000	0.000	0.000	0.000	0.000	55.970
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

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

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

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203873SF / <i>Ballistic Missile Defense Radars</i>
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This program element may include necessary civilian pay expenses required to manage, execute, and deliver Ballistic Missile Defense Radars weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 1206392SF and 1206398SF.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	21.615	20.752	9.065	0.000	9.065
Current President's Budget	23.194	20.752	12.024	0.000	12.024
Total Adjustments	1.579	0.000	2.959	0.000	2.959
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	2.160	0.000			
• SBIR/STTR Transfer	-0.581	0.000			
• Other	0.000	0.000	2.959	0.000	2.959

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 674820: *Sensor Development*

Congressional Add: *PARCS Radar Digitization Upgrade Study*

Congressional Add Subtotals for Project: 674820

Congressional Add Totals for all Projects

	FY 2023	FY 2024
	3.000	-
	3.000	-
	3.000	-

Change Summary Explanation

FY 2023: 2.160M Below Threshold Reprogramming to fund ADPE Requirements.

FY 2025: 4.598M transfer from Space Force Procurement funding (SPCMOD) for BMD radars to Space Force RDT&E BMD radars for CD upgrades needed to meet evolving space threats.

FY 2025: -1.663M decrease for higher Space Force priorities.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203873SF / <i>Ballistic Missile Defense Radars</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Description: The Automated Data Processing Equipment (ADPE) Rehost (ADPE-R) Phase II Signal Processor, Radar Controller and Receiver modernization. Mission Computer replacement will also be accomplished as soon as resources allow. The approach will modernize these systems with an innovative hardware and software-based open architecture solution supported by switching solutions and modernized development environments.</p> <p>FY 2024 Plans: Continue effort to upgrade the Signal Processor, Radar Controller, Receiver-Exciter (SPARC/REX) and Mission Computer. The programs will continue the development of software and hardware for the upgrade of the SPARC/REX and mission computer. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p>FY 2025 Plans: The FY 2025 PB restructures the ADPE-R program to continue development of the Signal Processor, Radar Controller, Receiver-Exciter (SPARC/REX) and support integration and testing for upgrading Mission Processing to address emerging threats, up to the point where it could be operationally accepted pending future decisions. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to ADPE rehost upgrade development ending prior to conducting formal site Operational Acceptance.</p>			
Accomplishments/Planned Programs Subtotals	20.194	20.752	12.024

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

D. Other Program Funding Summary (\$ in Millions)
N/A

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force Date: March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203873SF / <i>Ballistic Missile Defense Radars</i>
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D. Other Program Funding Summary (\$ in Millions)

Remarks

E. Acquisition Strategy

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

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

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force												Date: March 2024			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
3620F / 7				PE 1203873SF / Ballistic Missile Defense Radars				674820 / Sensor Development							
Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
ADPE Phase II, Mission Computer Replacement	SS/CPAF	Various : Colorado Springs, CO	-	7.742	Feb 2023	7.713	Oct 2023	4.150	Oct 2024	-		4.150	Continuing	Continuing	-
Signal Processor, Radar Controller, Receiver-Exciter Replacement	SS/CPAF	Various : Colorado Springs, CO	-	8.918	Feb 2023	10.419	Oct 2023	5.544	Oct 2024	-		5.544	Continuing	Continuing	-
PARCS Radar Digitization	SS/CPFF	Georgia Tech : Atlanta, GA	-	3.000	Jul 2023	-		-		-		-	0.000	3.000	-
SBIR/STTR	TBD	TBD : TBD	-	0.581	Oct 2022	0.479	Oct 2023	0.500	Oct 2024	-		0.500	Continuing	Continuing	-
Subtotal			-	20.241		18.611		10.194		-		10.194	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
ADPE Integration	Various	Riverside Res Institute : Colorado Springs, CO	-	0.700	Dec 2022	0.250	Dec 2023	0.302	Dec 2024	-		0.302	Continuing	Continuing	-
Subtotal			-	0.700		0.250		0.302		-		0.302	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	Various	Space Readiness Delta : Colorado Springs, CO	-	0.410	Mar 2023	0.327	Jan 2024	0.050	Jan 2025	-		0.050	Continuing	Continuing	-
Subtotal			-	0.410		0.327		0.050		-		0.050	Continuing	Continuing	N/A

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

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>ADPE Rehost Phase II, Part II SPARC/REX Replacement</i>	
Phase II, Part II Hardware/Software Development	
Phase II, Part II Systems Integration & Test	
<i>ADPE Rehost Phase II, Part II Mission Computer Replacement</i>	
Phase II, Part II Requirements Development & Design	
Phase II, Part II Hardware/Software Development	
Phase II, Part II Systems Integration & Test	
<i>PARCS Radar Digitization Upgrade Study</i>	
Digitization Upgrade Study	

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

Schedule Details

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203906SF / NCMC - TW/AA System
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	7.034	25.545	25.656	0.000	25.656	26.777	25.812	26.317	26.836	0.000	163.977
67A051: <i>Space Superiority - Advanced Intelligence Systems</i>	-	7.034	25.545	25.656	0.000	25.656	26.777	25.812	26.317	26.836	0.000	163.977
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This program element supports development activities for the North American Aerospace Defense Command (NORAD) Cheyenne Mountain Complex (NCMC) - Integrated Tactical Warning Attack Assessment (ITW/AA) system that provides timely, unambiguous, and continuous warning and attack assessment of air, missile and space threats to North America, and geographical theaters. This system integrates and correlates missile launch and air surveillance information from certified sources to assess the nature of an enemy launch/attack and issue warnings to the President of the United States, Canadian National Leadership, United States Secretary of Defense, National Military Command Center and war-fighting Combatant Commanders. NCMC-ITW/AA and Legacy Space Command and Control (C2) systems provide NORAD/US Northern Command (USNORTHCOM), US Strategic Command (USSTRATCOM), and US Space Command (USSPACECOM) command structures with the information management, decision aids, and connectivity required to monitor, assess, plan, and execute assigned strategic, space operations, and missile defense missions. It provides Nuclear C2 (NC2) and detonation detection.

The Combatant Commanders Integrated Command and Control System (CCIC2S) is a unique, integrated NC2 and Air and Space C2 "system of systems," providing data communication between external sensors and end users, mission processing for air and missile warning mission, and space operations functions. The system supports national strategic objectives with ITW/AA and provides missile, space, and air warning, cueing, and engagement information to strategic and theater combatant commanders. The system consists of terrestrial and space-based sensor outputs, NC2 and Air and Space C2 nodes, and communications and dissemination links, connecting the US and Canadian defense information networks.

ITW/AA C2 integration of Command and Control, Battle Management, and Communications (C2BMC) feeds is a continuation of previous efforts to address additional non-traditional sources to enhance the overall ITW/AA situational picture for the Combatant Command (CCOM). Utilizing the data from Global Data Integration (GDI) and C2BMC will provide additional situation data for the commander to address missile warning threats to the homeland and to decrease the decision time from minutes to seconds in a high threat environment that includes emerging threats from our advisories.

Missile Warning/Missile Track (MW/MT) Enhancement includes mission critical data from other non-traditional high-fidelity sources to address current and future emerging threats that are non-traditional ballistic missile threats. In order to address the new threat to the homeland, it is necessary to expand the available sources to update the ITW/AA situational picture for the CCOM and provide the necessary data for sound decisions for the Nuclear C3 (NC3) community.

The ITW/AA System of Systems Integration provides critical systems engineering support for ITW/AA interface verification, system deployment, change control management, monitoring and testing. It also supports risk reduction activities for evolving ITW/AA capabilities. This effort includes the development of an ITW/AA

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203906SF / NCMC - TW/AA System
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Assessment Management System (AMS) for planning configuration control and interoperability. It also includes development of an Emerging Threat Lab (ETL) using modern technology, agile processes, and automation to consolidate ITW/AA-related intelligence on current missile threats, integrate strategic and theater missile warning data, consolidate algorithms to identify and characterize threats. It also supports the Chief Scientist Office (CSO) in building algorithms and models which provide the capability for warfighters to determine timely and unambiguous missile warning for the National Command Authorities. This effort also includes Project Tombstone to improve the quality of test assessments and exercises, providing for a greater understanding of how our systems will respond in today's wartime environment. These System of Systems Integration efforts combine to ensure the attack assessments covering air, missile, and space threats continue to be accurate, timely, unambiguous and continuous, providing key decision makers the information and time they need to make decisions in case of attacks against the homeland.

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

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	7.249	25.545	25.611	0.000	25.611
Current President's Budget	7.034	25.545	25.656	0.000	25.656
Total Adjustments	-0.215	0.000	0.045	0.000	0.045
• 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	-0.215	0.000	0.045	0.000	0.045

Change Summary Explanation

FY2023: Decrease due to actuals adjustments.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
Title: ITW/AA C2 Integration of C2BMC Feeds	7.034	0.000	0.000
Description: Obtain and assess non-ITW/AA (Global Data Integration) and non-traditional data sources (C2BMC and theater) for integration into CCIC2S and Processing and Display System Migration (PDSM) to display a more complete event picture. Improve source data accuracy for missile warning mission and translate for integration into CCIC2S that will enhance mission displays and			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
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improve impact prediction. Create multiple display options for the operator and reduce ambiguity between missile defense and missile warning displays. Provide program office support and other related support activities, including but not limited to technical analysis, prototyping, user evaluations, and independent certification testing.			
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FY 2024 Plans:

N/A

FY 2025 Plans:

N/A

FY 2024 to FY 2025 Increase/Decrease Statement:

N/A

Title: ITW/AA System of Systems Integration	0.000	12.000	12.000
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Description: The ITW/AA System of Systems Integration coordinates and facilitates between multiple ITW/AA System Program Offices within the USSF and USAF to ensure these systems are integrated properly and the overarching ITW/AA Weapon System is providing timely, unambiguous, accurate, and continuous warning, assessment, and characterization information on atmospheric, ballistic missile, and space attacks to the President and Secretary of Defense of the United States, Allies, Joint Staff, combatant commands, and other users through all levels of conflict.

Ensure the ITW/AA requirements receive the necessary level of ITW/AA change control management related to interface analyses, integration issues, and collaboration with key stakeholders for continued mission data integrity and accuracy.

FY 2024 Plans:

Coordination across ITW/AA community to ramp up configuration change control, architecture management, and future initiative integration requiring additional effort to facilitate standardized review, assessment, coordination, control, planning, and baseline management of interface requirements to meet new United States Space Command Instruction 3422.01.

Initiate Project Tombstone to further develop agile scenario development, specializing in creating and maintaining test/training scenarios for MW, Missile Defense (MD), Space Domain Awareness (SDA) sensors and supporting systems/infrastructure. Tombstone effort maintains the existing scenarios with the most up-to-date information, building new developmental and operational test scenarios and supporting updates to scenario building tools and test analysis tools to further increase warfighter effectiveness in MD/MW/SDA domains.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 1203906SF / NCMC - TW/AA System		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>Testing and integration of additional data feeds into the ETL, analysis of these feeds to develop models/algorithms to increase effectiveness of multiple MW threat estimates and attack assessments.</p> <p>Assessment Management System development and initial fielding across USSF/USAF MW, MD, and AW systems. Effort requires modernization of antiquated health system requirements alignment across multiple organizations.</p> <p>Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p>FY 2025 Plans: Coordinate across ITW/AA community to ramp up configuration change control, architecture management, and future initiative integration requiring additional effort to facilitate standardized review, assessment, coordination, control, planning, and baseline management of interface requirements to meet new United States Space Command Instruction 3422.01.</p> <p>Continue Project Tombstone to further develop agile scenario development, specializing in creating and maintaining test/training scenarios for MW, MD, Space Domain Awareness (SDA) sensors and supporting systems/infrastructure. Tombstone maintains the existing scenarios with the most up-to-date information, building new developmental and operational test scenarios and supporting updates to scenario building tools and test analysis tools to further increase warfighter effectiveness in MD/MW/SDA domains.</p> <p>Test and integrate additional data feeds into the ETL, analyze these feeds to develop models/algorithms to increase effectiveness of multiple MW threat estimates and attack assessments.</p> <p>Continue Assessment Management System development and initial fielding across USSF/USAF MW, MD, and Air Warning (AW) systems. Effort requires modernization of antiquated health system requirements alignment across multiple organizations.</p> <p>Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: N/A</p>				
Title: MW/MT Enhancement		0.000	13.545	13.656

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203906SF / NCMC - TW/AA System
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Description: Integrate new data source to include Ballistic Missile Defense Communication Node (BCN) and Ground-Based Midcourse Defense (GMD) Communications Network (GCN) of the Missile Defense Agency (MDA) C2BMC integration element of the Ballistic Missile Defense System (BMDS). Enhance existing displays to incorporate new sensor with existing data, modernize database content with additional multi-domain meta-data to improve threat assessment and attack characterizations required to address new sensor data. Improves source data accuracy for missile warning mission and translate for integration into CCIC2S that will enhance mission displays and improve impact prediction. Creates multiple display options for the operator and reduces ambiguity between missile defense and missile warning displays.</p> <p>FY 2024 Plans: Funds the analysis, solution, and software coding of integration, processing, and display of high-fidelity data from non-ITW/AA and non-traditional sensor sources, resolving ambiguity and improving prediction accuracy, thus increasing the time critical National Command Authorities nuclear responses decision space. Addresses emergent space based missile threats and other capability gaps identified in the Global Threat Characterization Assessment recommendations. Enhances missile defense and missile warning information supporting a common operating picture.</p> <p>Harmonizes the displays between strategic Missile Warning, and Missile Defense. Integrates non-traditional source data to provide a seamless event-tracking and common operating picture.</p> <p>Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p>FY 2025 Plans: Continue the analysis, solution, and software coding of integration, processing, and display of high-fidelity data from non-ITW/AA and non-traditional sensor sources, resolving ambiguity and improving prediction accuracy, thus increasing the time critical National Command Authorities nuclear responses decision space.</p> <p>Continue addressing emergent space based missile threats and other capability gaps identified in the Global Threat Characterization Assessment recommendations.</p> <p>Continue enhancing missile defense and missile warning information supporting a common operating picture.</p> <p>Continue harmonizing the displays between strategic Missile Warning and Missile Defense.</p> <p>Continue integrating non-traditional source data to provide a seamless event-tracking and common operating picture.</p>			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities. FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased due to purchasing test equipment to inject new data sources for verification of upgrades.			
Accomplishments/Planned Programs Subtotals	7.034	25.545	25.656

D. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

E. Acquisition Strategy
ITW/AA C2 Integration of C2BMC Feeds initial effort was competitively awarded from an existing software services Indefinite Delivery/Indefinite Quantity (IDIQ) contract in Q4 FY 2021. This effort provided incremental deliveries to the ITW/AA sustainment provider for incorporation into the operational system. The use of experimentation, prototyping, risk reduction, and other efforts to develop new or re-purpose existing capabilities was accomplished through multi-source acquisitions.

MW/MT Enhancement effort will be a competitive single task order award in 2nd Quarter FY 2024 with options available to be awarded in 2nd Quarter FY 2025 for next phases of integration and testing.

USSF is developing acquisition strategy for the ITW/AA System of Systems Integration, but will maximize open competition as much as possible.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203906SF / NCMC - TW/AA System	Project (Number/Name) 67A051 / Space Superiority - Advanced Intelligence Systems
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development of ITW/AA C2 Integration of C2BMC Feeds	C/CPIF	LEIDOS : Colorado Springs, CO	-	6.646	Jan 2023	-		-		-		-	0.000	6.646	-
Product Development of Missile Warning/Missile Track Enhancement	C/TBD	TBD : TBD	-	-		9.651	Mar 2024	9.850	Oct 2024	-		9.850	Continuing	Continuing	-
Product Development of ITW/AA System of Systems Integration	C/TBD	TBD : TBD	-	-		8.520	Jan 2024	8.520	Oct 2024	-		8.520	Continuing	Continuing	-
Product Development of Emerging Threat Lab	C/TBD	TBD : TBD	-	-		1.500	Jan 2024	1.500	Oct 2024	-		1.500	Continuing	Continuing	-
SBIR/STTR	Allot	TBD : TBD	-	-		0.890	Oct 2023	0.896	Oct 2024	-		0.896	Continuing	Continuing	-
Subtotal			-	6.646		20.561		20.766		-		20.766	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
A&AS	C/CPIF	Various : Colorado Springs, CO	-	0.388	Jan 2023	4.742	Jan 2024	4.742	Jan 2025	-		4.742	Continuing	Continuing	-
Other Support	TBD	TBD : TBD	-	-		0.242	Jan 2024	0.148	Jan 2025	-		0.148	Continuing	Continuing	-
Subtotal			-	0.388		4.984		4.890		-		4.890	Continuing	Continuing	N/A

Project Cost Totals	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
	-	7.034	25.545	25.656	-	25.656	Continuing	Continuing	N/A

Remarks

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203906SF / NCMC - TW/AA System	Project (Number/Name) 67A051 / Space Superiority - Advanced Intelligence Systems

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>C2 Integration of C2BMC Feeds</i>				
C2 Integration Prime Contract	1	2023	4	2023
- Ingest GDI data into CCIC2S in TDF and CMAFS w/ user evaluation	1	2023	4	2023
- C2BMC Connectivity	1	2023	4	2023
- C2BMC Use and Display Data	1	2023	4	2023
<i>MW/MT Enhancement</i>				
MW/MT Enhancement Prime Contract	2	2024	4	2029
- Integrate first non-traditional data source into CCIC2S	4	2024	4	2025
- Integrate second non-traditional data source into CCIC2S	4	2025	4	2026
<i>ITW/AA System of Systems Integration</i>				
ITW/AA System of Systems Integration	2	2024	4	2029

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203913SF / <i>NUDET Detection System (SPACE)</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	60.429	93.391	83.426	0.000	83.426	76.968	78.552	81.388	82.993	0.000	557.147
672808: <i>Nuc Detonation Det Sys (sensors)</i>	-	60.429	93.391	83.426	0.000	83.426	76.968	78.552	81.388	82.993	0.000	557.147
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

The United States Nuclear Detonation (NUDET) Detection System (USNDS) provides a near real-time worldwide, highly survivable/endurable capability to detect, locate, and report any nuclear detonations in the earth's atmosphere or in near space. USNDS supports NUDET detection requirements across five mission areas: Integrated Tactical Warning and Attack Assessment (ITW/AA), Nuclear Force Management (NFM), Space Control, Treaty Monitoring, and a classified mission.

The USNDS program is jointly sponsored and funded by the Department of Defense (DoD), through the Space Force, and the Department of Energy (DOE), through the National Nuclear Security Administration (NNSA) and its Nuclear Detonation Detection (NA-22) office, respectively. NNSA/NA-22 supplies USNDS space sensors as Government Furnished Equipment to the Space Force's USNDS Program Office, which is responsible for all acquisition and Systems Engineering, Integration and Test activities on Space Vehicles (SVs), to include Global Positioning System (GPS) and additional hosts, and their supporting ground control segments. The AF directly funds the development of the USNDS ground segment (described below).

DoD funds their contribution to the USNDS program in Program Element 1203913SF, Research, Development, Test and Evaluation, Space Force (RDT&E, SF), Procurement, Space Force, and Operations and Maintenance.

USNDS consists of space sensors and complex ground segments. The space segment sensors, funded by DOE, consists of three nuclear detection sensor payloads: the Radiation Detection Capability (RADEC) payload for Defense Support Program (DSP) satellites, the Global Burst Detection (GBD) payload for Medium Earth Orbit platforms (GPS satellites), and the Space Atmospheric Burst Reporting System (SABRS) payload for Geosynchronous Earth Orbit (GEO) platforms (classified GEO host), and Space Test Platform 3. Together, these sensors and associated communications capability provided by the host satellites comprise the global NUDET space segment detection capability for the USNDS. Space sensors communicate NUDET indications to the fixed ground segment, the RADEC Data Processor, and the Integrated Correlation and Display System (ICADS), the five deployable mobile ground segment survivable Ground Nuclear Detonation Detection System Terminals (GNTs), and the survivable/endurable Universal Ground NDS Terminals (UGNTs), when operationally accepted. The ground segment provides ground receiving analysis and reporting capabilities to national authorities, commands, and forward users as well as Department of State for the Treaty Monitoring and Verification mission. The ground control segment is being modernized and continuously improved through an incremental, evolutionary acquisition approach.

The upgrades to the GNTs are the survivable/endurable UGNT which are funded with RDT&E in this program. The UGNT provides NUDET Detection Reports to end users through survivable/endurable USNDS communications via MilStar/Future Communication Systems (FCS)/Advanced Extremely High Frequency (AEHF) circuits. The GNT supports ITW/AA and NFM missions. The UGNT program modifies the baseline of the GNT subsystem and deploys as an integral part of the Space Based

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203913SF / <i>NUDET Detection System (SPACE)</i>
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Infrared System Survivable (SBIRS) / Endurable Evolution (S2E2) Mobile Ground System (MGS) (SMGS) units also in support of ITW/AA and NFM. The UGNT, when integrated with the SMGS, will perform NUDET event processing with fused NDS data from GPS and DSP. SMGS capability refers to the result of the S2E2 upgrade program for the MGS mission processing capability, including the integration of UGNT. The intended end state of UGNT integration is delivery of enhanced NUDET detection capabilities which meet survivable/endurable attack assessment requirements directed by the President, Secretary of Defense, Joint Staff, USSPACECOM, and USSTRATCOM, delivering long-term, cost effective, multi-role, multi-mission space effects to warfighters across the range of military operations.

ICADS 7 upgrades the ICADS 6 baseline necessary to process future GPS IIF satellites GBD USNDS messages, address technology obsolescence, and meet updated cybersecurity requirements for system resiliency.

This budget line includes systems engineering, research and development, on-orbit and field testing and end-to-end verification of USNDS space sensors, ground analysis and reporting systems in support of the five USNDS mission areas. Sensor integration for GPS III and GPS III Follow-on (IIF) are funded in their respective programs.

This program may include necessary civilian pay expenses required to manage, execute, and deliver NUDET Detection System (SPACE) weapon system capability. The use of such program funds is in addition to the civilian pay expenses budgeted in programs 1206392SF and 1206398SF.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	60.429	93.391	86.481	0.000	86.481
Current President's Budget	60.429	93.391	83.426	0.000	83.426
Total Adjustments	0.000	0.000	-3.055	0.000	-3.055
• 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	-3.055	0.000	-3.055

Change Summary Explanation

FY 2025: -0.022M; Withheld for higher priorities

FY 2025: The FY 2025 funding request was reduced by \$3.2 million to account for the availability of prior year execution balances.

FY 2025: +.124M; AF inflation rate

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203913SF / <i>NUDET Detection System (SPACE)</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Title: Integration with SBIRS S2E2 Mobile Ground Terminals (SMGTs)</p> <p>Description: Support the Integration and test activities between UGNTs and the SMGTs, which together provide NUDET Detection Reports and missile warning data to end users through survivable/endurable USNDS communications via MilStar/FCS/AEHF circuits. The UGNTs deploy as an integral part of the SMGS units also in support of ITW/AA and NFM. Support program scope analyzation for USNDS receiver and NUDET Decryption Unit (NDU) components. Additional support costs includes such activities as; receiver system engineering support, conceptual hardware and software design, check-out/support, testing, and system engineering.</p> <p>FY 2024 Plans: N/A</p> <p>FY 2025 Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: N/A</p>	3.400	0.000	0.000
<p>Title: ICADS 7</p> <p>Description: ICADS 7 consists of satellite ground data processing systems that accommodate the new NDS payload on GPS III F SVs and is an upgrade to the current ICADS 6 system. ICADS 7 includes new software, hardware and cybersecurity capabilities and NDS Analysis Package Ground Station (NAPGS) ground systems. The effort includes, but not limited to, the upgrade of two new ICADS 7 test beds, the replacement of the NDU, Enhanced Receiver Subsystems (ERS), and Automated Data Processors (ADP). A non-recurring Engineering effort is required to design the replacements for the NDUs, ERSs and ADPs currently on USNDS tests beds and fielded systems. The ICADS upgrade includes data processing changes to support the new USNDS optical sensor, known as Spectral Imaging Geolocation Hyper-Temporal Sensor (SIGHTS), that will be hosted on the GPS III F SVs.</p> <p>FY 2024 Plans: Continue to ramp up ICADS 7 preparation for Milestone B decision and Engineering & Manufacturing Development (EMD) phase leading up to Critical Design Review (CDR). Continue system development, including NDU, ERS, and software and hardware to support the USNDS payloads on GPS III F SVs. Continue systems engineering and test planning for GPS III F Mission Readiness Campaign, GPS III F Early Integration to include signal verification/data processing, on-orbit USNDS sensor integration, and Functional Configuration Audit/Physical Configuration Audit. Support next generation USNDS receiver development in collaboration with National Security Agency for crypto enclosure framework/algorithms. Continue upgrade of ICADS testbeds, ground modifications to USNDS sensor payload command plans for GPS III F, and NAPGS integration and testing. Rapidly</p>	57.029	93.391	83.426

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203913SF / <i>NUDET Detection System (SPACE)</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2025 Plans: Continue ICADS 7 development during EMD phase, including completion of CDR. Focus on development of new cryptographic devices NDU and Receiver, preparing for certification by respective NSA and GPS organizations. Program will increase efforts on software development for main database and processing subsystem, algorithm integration for optical, X-Ray and EMP sensors across multiple prime contractor developers and completion of testbed development. Deliver hardware to support the USNDS payloads on GPS IIIIF SVs, continued systems engineering and test planning for GPS IIIIF Mission Readiness Campaign, GPS IIIIF Early Integration to include signal verification/data processing, on-orbit USNDS sensor integration, and Functional Configuration Audit/Physical Configuration Audit. Ensure commonality across ICADS testbeds and planned ICADS 7 operational systems, ground modifications to USNDS sensor payload command plans for GPS IIIIF. Development, integration and testing of Sandia Data Analysis and Display System and NAPGS subsystems. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Funding decreases due to anticipated surge in CDR support ramping down after mid FY25.</p>			
Accomplishments/Planned Programs Subtotals	60.429	93.391	83.426

D. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2025</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>FY 2029</u>	<u>Cost To</u>	<u>Total Cost</u>
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	
• SPSF 01 01 Space Force	7.062	0.000	0.000	-	0.000	0.000	-	-	-	0.000	7.062
NUDETS: <i>Nudet Detection Space</i>											

Remarks

E. Acquisition Strategy
The USNDS Acquisition Strategy is to develop, integrate, field and sustain USNDS satellite sensors and USNDS ground data processing and distribution hardware and software as well as mission operational and technical program support to sustain the USNDS capability on GPS, DSP, Alternate Host, and SBIRS; funding is sent by Military Interdepartmental Purchase Request (MIPR) from DoD and DOE to Sandia, Los Alamos National Laboratories and other agencies on existing DOE/NNSA contracts. The ICADS 7 Acquisition Strategy was approved in September 2021 and the sole source prime contract awarded in June 2022. USNDS ICS funding for

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity
3620F: *Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development*

R-1 Program Element (Number/Name)
PE 1203913SF / *NUDET Detection System (SPACE)*

Ground Technology Program System of Systems will continue until UGNT is delivered at the end of FY 2023. USNDS requirements are defined in the Operational Requirements Document dated January 21, 2004.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203913SF / NUDET Detection System (SPACE)	Project (Number/Name) 672808 / Nuc Detonation Det Sys (sensors)
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
USNDS ICADS, GNT/UGNT, and Integration Support	MIPR	Sandia National Laboratory : Albuquerque, NM	-	3.400	Nov 2022	-		-		-		-	Continuing	Continuing	-
USNDS Technical Mission Analysis	RO	Aerospace : El Segundo, CA	-	0.142	Nov 2022	1.085	Nov 2023	1.043	Nov 2024	-		1.043	Continuing	Continuing	-
USNDS Enterprise SE&I	Various	TASC : El Segundo, CA	-	1.133	Nov 2022	4.322	Nov 2023	2.555	Nov 2024	-		2.555	Continuing	Continuing	-
Classified Development	TBD	Classified : Classified	-	-		-		-		-		-	Continuing	Continuing	-
ICADS 7	MIPR	Sandia National Laboratory : Albuquerque, NM	-	47.379	Nov 2022	75.970	Nov 2023	69.503	Nov 2024	-		69.503	Continuing	Continuing	-
Subtotal			-	52.054		81.377		73.101		-		73.101	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
USNDS On-orbit Sensor Testing	MIPR	Various : LANL, SNL, NM	-	3.706	Nov 2022	4.464	Nov 2023	4.023	Nov 2024	-		4.023	Continuing	Continuing	-
Subtotal			-	3.706		4.464		4.023		-		4.023	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
USNDS FFRDC	RO	Aerospace, MITRE : El Segundo, CA	-	2.329	Nov 2022	3.735	Nov 2023	3.368	Nov 2024	-		3.368	Continuing	Continuing	-
USNDS A&AS	Various	Various : Various	-	2.291	Nov 2022	3.735	Nov 2023	2.854	Nov 2024	-		2.854	Continuing	Continuing	-
USNDS Other Support	Various	Various : Various	-	0.049	Nov 2022	0.080	Nov 2023	0.080	Nov 2024	-		0.080	Continuing	Continuing	-
Subtotal			-	4.669		7.550		6.302		-		6.302	Continuing	Continuing	N/A

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203913SF / <i>NUDET Detection System (SPACE)</i>	Project (Number/Name) 672808 / <i>Nuc Detonation Det Sys (sensors)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
UGNT				
Integration between UGNTs and the S2E2 SMGTs	1	2023	4	2023
ICADS 7				
ICADS 7 Development	1	2023	4	2029
System Requirements Review (SRR)	1	2023	1	2023
Preliminary Design Review (PDR)	4	2023	4	2023
Milestone B	2	2024	2	2024
Critical Design Review (CDR)	2	2025	2	2025
Test Readiness Review (TRR)	2	2027	3	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203940SF / <i>Space Situation Awareness Operations</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	102.019	264.966	120.160	0.000	120.160	108.071	80.586	82.652	84.799	Continuing	Continuing
673940: <i>Space Data Fusion</i>	-	58.027	73.665	81.964	0.000	81.964	69.276	41.888	43.075	44.440	Continuing	Continuing
673941: <i>Unified Data Library (UDL)</i>	-	40.848	187.370	35.075	0.000	35.075	35.573	35.410	36.170	36.885	Continuing	Continuing
67A018: <i>SF Weather Services Research</i>	-	3.144	3.931	3.121	0.000	3.121	3.222	3.288	3.407	3.474	0.000	23.587

A. Mission Description and Budget Item Justification

Space Domain Awareness (SDA) is one of five core competencies of the Space Force and is the effective identification, characterization, and understanding of any factor, passive or active, associated with the space domain that could affect space operations and thereby impact the security, safety, economy, or environment of our nation. As the foundation for space control, SDA encompasses surveillance of all space objects and activities; detailed surveillance of specific space assets; monitoring space environmental conditions; monitoring cooperative space assets; gathering indications and warning on adversary space operations; and conducting integrated command, control, communications, processing, analysis, dissemination, and archiving activities.

This program fields, upgrades, operationalizes, operates, and maintains Space Force sensors and information/data integration capabilities within the SDA network while companion program element 1206425SF, Space Situational Awareness Systems, develops new network sensors and associated information integration capabilities across the network. Activities funded in this program (1203940SF) focus on surveillance of objects in earth orbit and beyond to aid tasks including satellite tracking; space object identification; tracking and cataloging; satellite attack warning; notification of satellite flyovers to U.S. forces; space treaty monitoring; and technical intelligence gathering. As a whole, this program upgrades, modifies, modernizes, operationalizes, fields, operates, and maintains sensors and information integration capabilities for an integrated, end-to-end SDA architecture that provides critical national security space solutions on tactical operational timelines.

The Space Data Fusion (SDF) project (673940) develops and/or upgrades SDA data/data exploitation capabilities, to include Global Sensor Watch (GSW), TAPOUT, and pre-planned product improvement efforts to operational SDA capability. GSW, in partnership with Australia's Department of Defense, provides an integrated, end-to-end, SDA tip & cue capability that implements a resilient architecture providing overlapping, assured, and viable surveillance options for executing event response, SDA data processing at multiple classification levels, and automated, worldwide, cross-sensor tipping & cueing. TAPOUT is a tactical SDA system which consists of a Hardware Layer, a Data Layer, and an Application layer to enable predictive threat warning in support of 18 SDS DET 1 mission.

The SDF project (673940) is supported by, and supports, the Joint Task Force Space Defense (JTF-SD) Commercial Operations (JCO) cell. The JCO's mission is to provide persistent and rapid SDA coverage to maximize decision making space and reduce reaction time in support of Protect & Defend missions. SDF commercial data buys beyond protect and defend missions support existing capabilities through improvements to architecture and system efficiency, cybersecurity, migration to cloud computing, building on artificial intelligence and machine learning (AI/ML) initiatives, and expanding agile software development, delivery, and integration practices.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1203940SF / <i>Space Situation Awareness Operations</i>
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The Unified Data Library project (673941) supports integration, exploitation, and delivery of data sources for command and control and battle management of space forces. UDL will continue to develop the library by on-boarding new data sets, directly connecting to SDA sensors, expanding data services, federating between enterprise data lakes, expanding defensive cyber operations capabilities, adding non-metric data to the SDA marketplace, continuing to expand local area network capability to share Space Surveillance Network (SSN) data in a cyber-secure manner, purchase commercial data and services to support USSPACECOM operations, allow optimized data flow for use of existing SDA capability and provide access to new commercial SDA innovations that will enable the broader SDA mission.

The SF Weather Services Research project (67A018) funds the operational development necessary to acquire, sustain, and modernize Air Force Weather Service (AFWS) capabilities in support of the 2022 National Defense Strategy. AFWS provides timely, accurate, resilient, and relevant environmental information to enable global battlespace situational awareness for Air Force (AF), Army, Special Operations Forces (SOF), Space Force (USSF), combatant commands, the Intelligence Community (IC), and other government agencies. AFWS provides climate impacts and assessments, as well as space and terrestrial weather sensing, forecasting, and weather analytic capabilities, at home station and deployed, in order to deliver critical environmental intelligence in support of decision makers to gain the asymmetric advantage during the full spectrum of air and space combat operations.

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 elements 1206392SF and 1206398SF.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	90.678	264.966	145.957	0.000	145.957
Current President's Budget	102.019	264.966	120.160	0.000	120.160
Total Adjustments	11.341	0.000	-25.797	0.000	-25.797
• 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	14.500	0.000			
• SBIR/STTR Transfer	-3.159	0.000			
• Other Adjustments	0.000	0.000	-25.797	0.000	-25.797

Change Summary Explanation

FY 2023: +14.500M Above Threshold Reprogramming for EDA and -3.159M for SBIR/STTR

FY 2025: -25.797 for higher U.S. Space Force priorities.

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203940SF / <i>Space Situation Awareness Operations</i>	Project (Number/Name) 673940 / <i>Space Data Fusion</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
<i>673940: Space Data Fusion</i>	-	58.027	73.665	81.964	0.000	81.964	69.276	41.888	43.075	44.440	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Space Data Fusion project (673940) develops and/or upgrades SDA data/data exploitation capabilities, to include Global Sensor Watch (GSW), TAPOUT, and provides pre-planned product improvement efforts to operational SDA capability.

GSW provides an integrated, end-to-end, SDA tip & cue capability that implements a resilient architecture providing overlapping, assured, and viable surveillance options for executing event response, SDA data processing at multiple classification levels, and automated, worldwide, cross-sensor tipping & cueing. Efforts directly enable support for Space Command & Control (C2) by developing & deploying advanced software algorithms to identify, acquire, characterize, and maintain custody of both space objects of interest and new foreign launches; developing & deploying advanced data analytics, machine learning, & artificial intelligence capabilities for rapid indication & warning; enhancing space environmental monitoring solutions; integrating and optimizing access to United States Government (USG), coalition, commercial, academic, intelligence community (IC) & Missile Defense Agency sensors to better support the broader space enterprise; supporting USSPACECOM operations and training exercises; leading trials, testing and training campaigns to test & optimize capabilities in support of the broader space kill chain; enhancing sensor performance to close the solar exclusion gap by leveraging modern technology and commercial & IC sensors for greater space domain coverage; and improving legacy communication paths through efforts such as upgrading legacy sensor communications and developing a redundant, terrestrial and space-based mesh communication network to enable a more complex space enterprise capability.

The mission of the current Joint Task Force Space Defense (JTF-SD) Commercial Operations (JCO) as of Aug 2022 is to provide persistent and rapid SDA coverage to maximize decision making space and reduce reaction time in support of Protect & Defend missions. The JCO augments JTF-SD tracking data, real-time visual magnitude, and real-time passive radio frequency (RF) using commercial capabilities. This funding will be used to support to a variety of other commercial mission sets beyond the protect and defend capabilities.

The Commercial Data Buys Beyond Protect and Defend Major Thrust Area will support existing capabilities through improvements to architecture and system efficiency, cybersecurity, migration to cloud computing, building on artificial intelligence and machine learning (AI/ML) initiatives, and expanding agile software development, delivery, and integration practices. As data ingress and egress grow, incorporate additional associated cloud-hosting, data service development, security, system administration, data on boarding, data as a service platform retention, processing, and normalization beyond protect and defend.

Provide support to JCO missions beyond the initial Protect & Defend capabilities. Review, adjudicate, and integrate initial capabilities with multiple commercial providers. These capabilities are planned to include: Geosynchronous Equatorial Orbit (GEO) spaceflight safety; Electromagnetic interference (EMI) detection and geolocation support for Positioning, Navigation and Timing (PNT); as well as space-based SDA augmentation from commercial providers. The expanding capabilities will build system resiliency and situational awareness. Activities may include, but are not limited to: studies, technical analysis, risk reduction experiments and prototyping,

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203940SF / <i>Space Situation Awareness Operations</i>	Project (Number/Name) 673940 / <i>Space Data Fusion</i>
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integration and test of C2, resiliency measures and mission partner interfaces, and office support etc. Towards the close of FY 2024, the desired end state is the expectation of three new capabilities in deployment.

TAPOUT is a tactical SDA system which consists of a Hardware Layer, a Data Layer, and an Application layer. The planned Hardware Layer is the result of 2 years of prototyping, analysis, and collaboration with industry. Sixteen globally dispersed sites have been identified to field daytime/nighttime capable ground based sensors which will be remotely commanded and controlled through the Data and Application layers. The Data Layer consists of multi-source data feeds which are aggregated at a classified level where predictive threat warning occurs. The Application Layer consists of a series of Threat Warning and C2 applications at multiple classification levels which enable monitoring, and tactical command and control of the network.

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

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
<p>Title: Global Sensor Watch (GSW)</p> <p>Description: GSW provides an integrated SDA architecture to deliver a resilient, high capacity, sensitive, timely, and comprehensive global ground and space-based network of sensors that cover the geocentric and cislunar orbital regimes. GSW is a resilient, automated cross-sensor tip and cue capability that provides overlapping, assured, and viable surveillance options for executing event response, and SDA data processing at multiple classification levels. In order to ensure the successful implementation of a resilient, overlapping, assured, and viable architecture, GSW includes the necessary sensor communication upgrades to ensure data transport/throughput, compatibility, and effects-based tactical tasking/response functionality. To do this, GSW enables highly available, non-stovepiped sensor planning, tasking, response, and data collection, as well as processed information/products/results to be stored, shared, and integrated for warfighting and analysis.</p> <p>GSW will continue coordination international work with Japanese Ministry of Defense (JMOD) on the development of classified C2 and SDA data sharing between a Japanese Space Operations Center (SpOC) and the U.S. Combined Space Operations Center (CSpOC). This will align Japanese sensors and United States Government (USG) and non-USG assets to provide critical national security space solutions on tactical operational timelines and continue to pursue security cooperations with other international partners such as Canada and the United Kingdom.</p> <p>FY 2024 Plans: Continue GSW sensor communication upgrades (SCU) for the remaining sites of existing systems, including radar sites at Eglin Air Force Base, Florida, Upgraded Early Warning Radars (UEWR), Millstone Radar Site Massachusetts, and Reagan Test Site (RTS) assets, to facilitate GSW tip and cue operations. Complete mesh network prototype demonstration for essential communications and resilient data transport capability. Continuation of RTS work on radome and sensor array development</p>	58.027	55.765	72.964

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203940SF / <i>Space Situation Awareness Operations</i>	Project (Number/Name) 673940 / <i>Space Data Fusion</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>on Ground Based Radar-Kwajalein work. Continuation of planning and upgrades to other SDA sensors, such as DARC Site 1, COBRA DANE, GEODSS, and Ascension Site C (depending on Ascension status). Integrate MDA to augment SSN connectivity.</p> <p>Continue GSW software development for incorporating non-traditional data sources and efforts to modernize legacy sensor message formats and protocols for greater accuracy. Continue integration of GSW tip and cue software at existing radar sites. Continue automation of manual SDA processes.</p> <p>Support USSPACECOM operations and test activities to vet new SDA capability deliveries and concepts of operations for optimizing legacy SDA sensors operations. Establish a SDA tip and cue sensor test asset.</p> <p>Complete Mission-driven Autonomous Collaborative Heterogeneous Intelligent Network Architecture (MACHINA) integration with the Air Force Research Lab (AFRL) Tako telescope network. Complete MACHINA integration with the secret-level Dynamic Optical Telescope System (DOTS) in Maui, and other sensors.</p> <p>Complete initial ops fielding for dynamic tasking input compatibility with mission partner Concept C mission system. Complete fielding of launch custody and high-rate-revisit capabilities at Millstone, Haystack Auxiliary Radar (X-band) (Haystack), and ARPA Long Range Tracking and Instrumentation Radar (VHF & UHF band) (ALTAIR) radars.</p> <p>Continue developing classified C2 and SDA sharing with the Japanese Space Operations Center (JSpOC) and expand Security Cooperation activities with other International mission partners, such as Canada and the United Kingdom.</p> <p>TAPOUT will complete 1) operations with existing sensors, 2) procurement and fielding of TAPOUT sensors, especially long lead items that require early purchase orders to meet the FOC timeline, 3) improvement of external network interfaces, 4) enhancement of existing TAPOUT Threat Warning capabilities and tactical messaging, and 5) provided training.</p> <p>Additionally, FY 2024 funding will allow the program to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to: studies, technical analysis, risk reduction experiments and prototyping, integration and test of command and control (C2), resiliency measures and mission partner Interfaces via network and network modernization, space test/combat range events, and office support etc.</p> <p>FY 2025 Plans: Continue GSW sensor communication upgrades (SCU) and MDA integration for the remaining assets and capabilities, in support of the USSPACECOM funded Project Lighthouse (LH1 & LH2) including:</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203940SF / <i>Space Situation Awareness Operations</i>	Project (Number/Name) 673940 / <i>Space Data Fusion</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>-Integrate radar sites at Eglin Air Force Base, Florida; Upgraded Early Warning Radars (UEWR), Millstone Radar Site Massachusetts, and Reagan Test Site assets (Space Fence, Millimeter Wave (MMW) Radar, ARPA Lincoln C-Band Observables Radar (ALCOR), Haystack Ultrawideband Satellite Imaging Radar (HUSIR), and The Haystack Auxiliary (HAX) Radar with other characterization and operational intelligence capabilities.</p> <p>-Continue Ground Based Radar-Kwajalein radome work and sensor array development.</p> <p>-Continue efforts towards DARC Site 1; COBRA DANE; GEODSS; Ascension Site C and REDLAN, as sites are available.</p> <p>-Award contract for Ascension SDA replacement radar (previously Ascension Site C) to fill USSPACECOM LEO detection and tracking capability gap in South Atlantic; continue site preparation and begin execution of hardware and software technical refresh and capability upgrades.</p> <p>-Vet new SDA capability deliveries and concepts of operations for optimizing legacy SDA sensor operations via other USSPACECOM operations and test activities.</p> <p>Continue GSW integration and fielding of:</p> <p>-Expand to additional SSN sites, mesh network for essential SCU communications and resilient data transport capability.</p> <p>-Upgrades to end-to-end SSN sensor communications at additional sites which facilitate tip and cue sensor operations.</p> <p>-Modernize legacy sensor message formats and protocols for greater accuracy via non-traditional data sources.</p> <p>-Continue Tip-and-cue software and launch custody and high-rate revisit capabilities at Millimeter Wave (MMW) Radar, ARPA Lincoln C-Band Observables Radar (ALCOR), Haystack Ultrawideband Satellite Imaging Radar (HUSIR), Haystack Auxiliary (HAX) and ALTAIR radars.</p> <p>-Automate SDA process such as MACHINA integration with the secret-level GEODSS system in Maui and other sensors.</p> <p>-Continue developing and integration of classified C2 and SDA sharing with the Japanese Space Operations Center (JSpOC) and expand Security Cooperation activities with other International mission partners, such as Canada and the United Kingdom.</p> <p>Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increase due to addition of Project Lighthouse funding.</p>				
Title: Commercial Data Buys Beyond Protect and Defend		0.000	17.900	9.000
Description: The mission of the current Joint Task Force Space Defense (JTF-SD) Commercial Operations (JCO) as of Aug 2022 is to provide persistent and rapid Space Domain Awareness (SDA) coverage to maximize decision making space and reduce reaction time in support of Protect & Defend missions. The JCO augments JTF-SD tracking data, real-time visual magnitude,				

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203940SF / <i>Space Situation Awareness Operations</i>	Project (Number/Name) 673940 / <i>Space Data Fusion</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>and real-time passive radio frequency (RF) using commercial capabilities. This funding will be used to support a variety of other commercial mission sets beyond the protect and defend capabilities.</p> <p>FY 2024 Plans: Provide support to JCO missions beyond the initial Protect & Defend capabilities. Review, adjudicate, and integrate initial capabilities with multiple commercial providers. These capabilities are planned to include: Geosynchronous Equatorial Orbit (GEO) spaceflight safety; Electromagnetic interference (EMI) detection and geolocation support for Positioning, Navigation and Timing (PNT); as well as space-based SDA augmentation from commercial providers. The expanding capabilities will build system resiliency and situational awareness.</p> <p>Support existing capabilities through improvements to architecture and system efficiency, cybersecurity, migration to cloud computing, building on artificial intelligence and machine learning (AI/ML) initiatives, and expanding agile software development, delivery, and integration practices. As data ingress and egress grow, incorporate additional associated cloud-hosting, data service development, security, system administration, data on boarding, data as a service platform retention, processing, and normalization beyond protect and defend, with the goal of deploying three new capabilities by the end of FY 2024.</p> <p>Activities may include, but are not limited to studies, technical analysis, risk reduction experiments and prototyping, integration and test of C2, resiliency measures and mission partner interfaces, and office support etc.</p> <p>FY 2025 Plans: Combine Joint Commercial Operations 24/7 GEO Protect and Defend mission (Which include multiple partner nations across three geographic sectors named Americas, Meridian, Pacific) with additional capabilities which achieved successful prototyping during FY24 events. The potential prototypes include LEO SDA support using both ground-centric and space-to-space collection; electromagnetic frequency SDA and interference detection and geolocation support across the spectrum (e.g., PNT); on-orbit GEO SDA augmentation from commercial providers; persistent revisit of the GEO belt for military space flight safety in coordination with the DOC; cyber SDA support; space-to-ground imagery collection in tactical support of unified combatant commands as directed by the recent Tac ISR/SRT initiative; and RF TT&C SDA monitoring and link support augmentation.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Funding decreased due to higher Space Force priorities.</p>				
Title: Space Data Fusion/Unified Data Library (UDL)		0.000	0.000	0.000
Description: Space Data Fusion develops Unified Data Library (UDL) capabilities to support integration, exploitation, and delivery of data sources for command and control and battle management of space forces. UDL will continue to develop the library by onboarding new data sets, expand data services, expand defensive cyber operations capabilities, add non-metric data to the SDA				

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203940SF / <i>Space Situation Awareness Operations</i>	Project (Number/Name) 673940 / <i>Space Data Fusion</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
marketplace, continue to expand local area network capability to share Space Surveillance Network (SSN) data in a cyber-secure manner, and purchase commercial data and services to support USSPACECOM operations, allow optimized data flow for use of existing SDA capability, and provide access to new commercial SDA innovations that will enable the broader SDA mission.			
FY 2024 Plans: N/A			
FY 2025 Plans: N/A			
FY 2024 to FY 2025 Increase/Decrease Statement: N/A			
Accomplishments/Planned Programs Subtotals	58.027	73.665	81.964

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025 Base</u>	<u>FY 2025 OCO</u>	<u>FY 2025 Total</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>FY 2029</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• SPAF 01 SPCMOD: <i>Space Mods</i>	8.331	2.079	-	-	-	-	-	-	-	0.000	10.410

Remarks

D. Acquisition Strategy

The acquisition strategies for GSW include a mix of modifications to existing Air Force or Space Force contracts and directing funds to other Air Force, Space Force, or DoD organizations for contract support.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203940SF / <i>Space Situation Awareness Operations</i>	Project (Number/Name) 673940 / <i>Space Data Fusion</i>
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
GSW Integration (Dev, Sensor, C2)	Various	MIT/LL : Lexington, MA	-	-		18.678	Nov 2023	16.416	Nov 2024	-		16.416	Continuing	Continuing	-
GSW Sensor Comm Upgrades	Various	Various : Various	-	22.865	Mar 2023	26.453	Nov 2023	47.376	Nov 2024	-		47.376	Continuing	Continuing	-
GSW Exploitation	Various	MIT/LL : Lexington, MA	-	16.150	Mar 2023	-		-		-		-	0.000	16.150	-
GSW Dynamic Tasking	Various	Various : Various	-	9.850	Dec 2022	-		-		-		-	0.000	9.850	-
GSW SW Development 3	Various	Sandia National Labs : Albuquerque, NM	-	1.337	Nov 2022	-		-		-		-	0.000	1.337	-
GSW Commercial Data Buys Beyond Protect and Defend	Various	Various : Colorado Springs, CO	-	-		15.740	Oct 2023	8.091	Oct 2024	-		8.091	Continuing	Continuing	-
TAPOUT	MIPR	AFRL : Various	-	2.425	Oct 2022	2.436	Nov 2023	-		-		-	0.000	4.861	-
SBIR/STTR	Allot	Not specified. : TBD	-	-		2.578	Oct 2023	2.951	Oct 2024	-		2.951	Continuing	Continuing	-
Subtotal			-	52.627		65.885		74.834		-		74.834	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
A&AS	Various	Various : Colorado Springs, CO	-	2.650	Dec 2022	4.700	Nov 2023	4.600	Nov 2024	-		4.600	Continuing	Continuing	-
FFRDC	RO	Various : Colorado Springs, CO	-	2.000	Nov 2022	2.700	Nov 2023	2.300	Nov 2024	-		2.300	Continuing	Continuing	-
Other Support	Various	Various : Colorado Springs, CO	-	0.750	Dec 2022	0.380	Nov 2023	0.230	Nov 2024	-		0.230	Continuing	Continuing	-
Subtotal			-	5.400		7.780		7.130		-		7.130	Continuing	Continuing	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203940SF / <i>Space Situation Awareness Operations</i>	Project (Number/Name) 673940 / <i>Space Data Fusion</i>

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Global Sensor Watch (GSW)	
GSW Operationalization	
GSW Sensor Comm Upgrades - LH1 Site Operational	
GSW Sensor Comm Upgrades - LH2 Site Operational	
GSW Prototypes/Integration	
GSW Support for Command and Control (mesh network development-SDA Net)	
TAPOUT Experimental Operations and Development	
TAPOUT Experimental Evaluation Period	
TAPOUT IOC	
TAPOUT FOC	
Commercial Data Buys Beyond Protect and Defend	
Americas-Only Developmental Support	
Meridian Expansion Support	
Pacific Expansion Support	
Global Development Support for Command and Control	
New Capability Experimentation and Integration	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203940SF / <i>Space Situation Awareness Operations</i>	Project (Number/Name) 673940 / <i>Space Data Fusion</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Global Sensor Watch (GSW)</i>				
GSW Operationalization	1	2023	4	2029
GSW Sensor Comm Upgrades - LH1 Site Operational	1	2023	3	2023
GSW Sensor Comm Upgrades - LH2 Site Operational	1	2023	2	2024
GSW Prototypes/Integration	1	2023	1	2025
GSW Support for Command and Control (mesh network development-SDA Net)	1	2023	4	2025
TAPOUT Experimental Operations and Development	1	2023	4	2024
TAPOUT Experimental Evaluation Period	1	2024	4	2024
TAPOUT IOC	3	2024	3	2024
TAPOUT FOC	1	2025	1	2025
<i>Commercial Data Buys Beyond Protect and Defend</i>				
Americas-Only Developmental Support	1	2024	4	2028
Meridian Expansion Support	1	2024	4	2028
Pacific Expansion Support	1	2024	4	2028
Global Development Support for Command and Control	1	2024	4	2028
New Capability Experimentation and Integration	1	2024	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 7					R-1 Program Element (Number/Name) PE 1203940SF / <i>Space Situation Awareness Operations</i>				Project (Number/Name) 673941 / <i>Unified Data Library (UDL)</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
673941: <i>Unified Data Library (UDL)</i>	-	40.848	187.370	35.075	0.000	35.075	35.573	35.410	36.170	36.885	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Unified Data Library project (673941) supports integration, exploitation, and delivery of Space Domain Awareness (SDA) data sources for Command and Control (C2) and battle management of space forces. It focuses on enabling data sharing, establishing the data architecture required to aggregate multi-sensor data for broader use at different classification levels, transforming any-source data into normalized, usable information via data exploitation tools, followed by data hand off to Battle Management Command and Control mission systems to support actual space operations. UDL efforts include purchasing commercial SDA data and services in support of US Space Command (USSPACECOM) operations. The UDL will directly connect to dedicated USSF collateral, contributing and non-traditional sensors and systems with modernized interfaces and transport options to broadly expose data. The UDL will be the single source for accessing and managing all data in support of the USSF, providing a central location to find and access data, enabling superior analytics.

Enterprise Data Architecture (EDA) is an emergent Unified Data Library (UDL) requirement prototype pursuing an authority to operate on both unclassified and classified domains. EDA will strategically execute experimentation, prototyping, and risk reduction to build an enterprise data architecture providing relevant data and a repository architecture to be managed and federated at the enterprise level with an agile data strategy. Architecture will incorporate DAF CDAO enterprise services to ensure a common infrastructure will enable integration between Space Domain Awareness and other mission area artificial intelligence decision-support tools synthesizing field data to assess and report near real-time force readiness status.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Unified Data Library (UDL)	26.348	55.970	35.075
Description: UDL capabilities support integration, exploitation, and delivery of data sources for command and control and battle management of space forces. UDL will continue to develop the library by on-boarding new data sets, directly connecting to SDA sensors, expanding data services, federating between enterprise data lakes, expanding defensive cyber operations capabilities, adding non-metric data to the SDA marketplace, continuing to expand local area network capability to share Space Surveillance Network (SSN) data in a cyber-secure manner, purchasing commercial data and services to support USSPACECOM operations, allowing optimized data flow for use of existing SDA capability, and providing access to new commercial SDA innovations that will enable the broader SDA mission. The UDL enables analysis across the global space enterprise, as well as for Space Force related exercise support, cross-domain solution services and integration of the legacy communications architecture with the UDL.			
FY 2024 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203940SF / <i>Space Situation Awareness Operations</i>	Project (Number/Name) 673941 / <i>Unified Data Library (UDL)</i>

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
<p>Continue to expand UDL infrastructure to maintain digital superiority, support an increased number of customers and operations across multiple security environments. Expand the enterprise support structure to allow the UDL to be "franchised" and proliferated at different classification levels, yet supported by a common source of system administration for all UDL instances located at any classification level through Special Access Programs (SAP). Implement federation with five other existing Department of the Air Force (DAF) enterprise data lakes to expose data for the purposes of advanced data analytics. Incorporate commercial SDA related data and information to increase data samples and improve overall SDA picture for government customers. Expand cybersecurity efforts to include persistent red team analysis of broader UDL architecture and ensure zero trust.</p> <p>Directly connect the UDL to 20+ additional Space Surveillance Network (SSN) and non-traditional SDA sensors with modernized interfaces and transport options. Streamline SDA related data flows as transport options are implemented to meet SDA objectives. Expand bi-directional data sharing capabilities between C2 Centers and SDA systems, implement bi-directional data sharing with coalition and allied partners, and implement edge computing platform strategies to enhance the situational awareness necessary to operate in a congested space domain. As data ingress and egress grow, a portion of the funds will cover associated cloud-hosting costs, data service development, security, system administration, data on boarding, data as a service platform retention, processing, and normalization. Analyze space warfighting data across the global space enterprise, as well as for Space Force related exercise support, cross-domain solution services and integration of the legacy communications architecture with the UDL. Additionally, FY 2024 funding will enable the program to implement system redundancy and resiliency to meet availability objectives in support of analysis and planning requirements. Activities may include, but are not limited to studies, technical analysis, risk reduction experiments, prototyping, integration and test of C2, evaluation of resiliency measures and mission partner interfaces, space test/combat range events, and expanded program support.</p> <p>FY 2025 Plans:</p> <p>Continue to expand UDL infrastructure to maintain digital superiority, support an increased number of providers and consumers and operations across multiple security environments. Expand the enterprise support structure to allow the UDL to be "franchised" and proliferated at different classification levels yet be supported by a common source of system administration for all UDL instances located at any security level, up to and included Special Access Programs (SAP). Continue to incorporate commercial SDA related data and information to increase data samples and improve the overall SDA "picture" for government customers. Continue to expand cybersecurity efforts to include persistent red team analysis of broader UDL architecture and ensure zero trust. Renew UDL's Authority to Operate (ATO).</p> <p>Continue the direct connect to additional SSN and non-traditional SDA sensors with modernized interfaces and transport options replacing connections to legacy processing systems and networks to improve latency. Continue to streamline SDA related data flows as transport options are implemented to meet SDA objectives. Continue to expand bi-directional data sharing capabilities between C2 Centers and SDA systems, implement bi-directional data sharing with coalition and allied partners, and implement edge computing platform strategies to enhance the situational awareness necessary to operate in a congested space domain. As</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203940SF / <i>Space Situation Awareness Operations</i>	Project (Number/Name) 673941 / <i>Unified Data Library (UDL)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>data ingress and egress grows, a portion of the funds will cover cloud-hosting costs, data service development, security, system administration, data on boarding, data as a service platform retention, processing, and normalization, cross domain solutions and integration of the legacy communications architecture with the UDL through translation services. Support the analysis of space warfighting data across the global space enterprise to include Space Force related exercises.</p> <p>Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to fewer planned new data connections and reduced cloud hosting costs.</p>				
<p>Title: Expansion of sensor communications upgrades and data integration</p> <p>Description: Expand planned sensor communications upgrades and the integration of non-traditional and commercial data. Deliver data on tactically relevant timelines from sensor to UDL and C2.</p> <p>FY 2024 Plans: Due to the classified nature of this project, specific details are available at a higher classification level.</p> <p>FY 2025 Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to FY 2025 funding being correctly moved to the Space Data Fusion project (673940). An error in the FY 2024 budget document incorrectly placed the FY 2024 funding into the UDL project instead of the Space Data Fusion project. Once FY 2024 funds are appropriated, the USSF will move to and execute these funds in the Space Data Fusion project.</p>		0.000	131.400	0.000
<p>Title: Enterprise Data Architecture</p> <p>Description: Funds are required to support an emergent requirement for Unified Data Library to finalize an Enterprise Data Architecture (EDA) prototype with authority to operate on both unclassified and classified domains. The EDA will enable integration between Space Domain Awareness and other mission area artificial intelligence decision-support tools synthesizing field data to assess and report near real-time force readiness status.</p> <p>FY 2024 Plans: N/A</p> <p>FY 2025 Plans:</p>		14.500	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203940SF / <i>Space Situation Awareness Operations</i>	Project (Number/Name) 673941 / <i>Unified Data Library (UDL)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
N/A			
Accomplishments/Planned Programs Subtotals	40.848	187.370	35.075

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

In FY23 EDA received \$14.5M in Above Threshold Reprogramming (ATR) funding in October of 2023 in support of SDA which will normalize, standardize and condition data to implement attribute-based access control (ABAC) to enable enterprise data federation and AI/ML. It will implement an automated CAP/SAP data management platform providing a foundational zero trust architecture deployable to on-demand or disconnected off-premise, on-premise and edge computing environments; consistently apply these capabilities and governance to all classifications and inform higher-level data enterprise.

In FY 2025 the UDL program plans to execute a follow-on contract for the next generation of the UDL platform in support of emerging mission requirements. The USSF expects to be executing this strategy within the Software Acquisition Pathway. The program also plans to continue leveraging the Space Enterprise Consortium (SpEC) Other Transaction Authority (OTA) and other contract vehicles to continue strengthening the USSF data and digital infrastructure.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203940SF / <i>Space Situation Awareness Operations</i>	Project (Number/Name) 673941 / <i>Unified Data Library (UDL)</i>
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
UDL Data Science Working Group	C/CPFF	L3Harris : Colorado Springs, CO	-	-		0.600	Jan 2024	-		-		-	0.000	0.600	-
UDL Commercial Data	Various	Various : Various	-	3.000	Jan 2023	3.000	Jan 2024	-		-		-	0.000	6.000	-
UDL Development/Data Onboarding	Various	Various : Various	-	8.048	Dec 2022	27.027	Dec 2023	17.188	Dec 2024	-		17.188	Continuing	Continuing	-
UDL Cloud Hosting	Various	Various : Various	-	6.048	Mar 2023	15.690	Mar 2024	5.872	Mar 2025	-		5.872	Continuing	Continuing	-
EDA Cloud Hosting	Various	Various : Various	-	1.430	Jan 2024	-		-		-		-	0.000	1.430	-
EDA Infrastructure	Various	Various : Various	-	12.515	Jan 2024	-		-		-		-	0.000	12.515	-
UDL Technical Mission Analysis	RO	Aerospace : El Segundo, CA	-	2.643	Nov 2022	1.122	Nov 2023	1.852	Nov 2024	-		1.852	Continuing	Continuing	-
Expansion of sensor comm upgrades and data integration	TBD	TBD : TBD	-	-		131.400	Mar 2024	-		-		-	0.000	131.400	-
SBIR/STTR	Allot	TBD : TBD	-	-		1.950	Oct 2023	1.228	Oct 2024	-		1.228	Continuing	Continuing	-
Subtotal			-	33.684		180.789		26.140		-		26.140	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test & Evaluation	Various	Various : Colorado Springs, CO	-	-		-		1.097	Nov 2024	-		1.097	Continuing	Continuing	-
Subtotal			-	-		-		1.097		-		1.097	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
A&AS	Various	Various : Colorado Springs, CO	-	3.961	Dec 2022	3.931	Dec 2023	5.059	Apr 2025	-		5.059	Continuing	Continuing	-

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203940SF / <i>Space Situation Awareness Operations</i>	Project (Number/Name) 673941 / <i>Unified Data Library (UDL)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Unified Data Library (UDL)</i>				
UDL Data Science Working Group	2	2024	4	2024
UDL Cloud Hosting	1	2023	4	2029
UDL Axe	1	2024	4	2029
UDL Platform/Space Onboarding Component	1	2023	4	2029
UDL Cloud Component Development	1	2024	4	2029
Cross Functional UDL Integration	1	2024	4	2029
UDL Component Integration	2	2025	4	2029
UDL Cross Domain Solution Support	1	2024	4	2029
UDL AI/ML Support	2	2023	4	2029
UDL Test and Integration	2	2024	4	2029
EDA	2	2024	4	2024
<i>UDL Commercial Data</i>				
Commercial Data	1	2023	4	2025

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force										Date: March 2024		
Appropriation/Budget Activity 3620F / 7					R-1 Program Element (Number/Name) PE 1203940SF / <i>Space Situation Awareness Operations</i>				Project (Number/Name) 67A018 / <i>SF Weather Services Research</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
67A018: <i>SF Weather Services Research</i>	-	3.144	3.931	3.121	0.000	3.121	3.222	3.288	3.407	3.474	0.000	23.587
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This budget activity funds the operational development necessary to acquire, sustain, and modernize SF Weather Services Research capabilities in support of the 2022 National Defense Strategy's (NDS) three lines of effort: build a more lethal force, strengthen alliances and attract new partners, and change the way we do business.

To improve readiness for a more lethal force, SF Weather Services Research provides timely, accurate, resilient, and relevant environmental information to enable global battlespace situational awareness for Air Force (AF), Army, Special Operations Forces (SOF), Space Force (USSF), combatant commands, the Intelligence Community (IC), and other government agencies. SF Weather Services Research provides climate impacts and assessments, as well as space and terrestrial weather sensing, forecasting, and weather analytic capabilities, at home station and deployed, in order to deliver critical environmental intelligence in support of warfighters to gain the asymmetric advantage during the full spectrum of air and space combat operations. SF Weather Services Research decreases the risk to mission and risk to force by increasing the lethality, effectiveness, and survivability of Department of Defense (DoD) weapon systems.

To strengthen alliances and partnerships, SF Weather Services Research development efforts integrate DoD, government agency, commercial, and international partner environmental data with AFWS information system equipment for processing, storing, exploiting, and disseminating multi-domain weather information for analysis, forecasting, mission integration, and greater interoperability.

To ensure greater performance and affordability for the Department of the AF, SF Weather Services Research sensors and information systems are being modernized through improvements to architecture and system efficiency, cybersecurity, joint all-domain command and control (JADC2) and sensing grid integration, migration to cloud computing, artificial intelligence and machine learning (AI/ML) initiatives, and expanding agile software development, delivery, and integration practices. The AF Weather Enterprise digital transformation and cloud migration effort modernizes key capabilities providing the military advantage to accurately predict environmental impacts optimizing mission planning, targeting, weaponeering, mission execution, battle damage assessment, and space systems operations.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: Space Weather Analysis and Forecast System (SWAFS)	3.144	3.931	3.121
Description: The SWAFS legacy baseline is currently being redesigned and upgraded under the Space Domain Awareness Environmental Toolkit for Defense (SET4D) effort to satisfy Space Domain Awareness goals for a modern cloud hosted infrastructure that is cyber resilient and integrated with the Unified Data Library. The Energetic Charged Particle Hazard Assessment System (ECP HAS) is one of several models and applications within the SET4D environment designed to			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203940SF / <i>Space Situation Awareness Operations</i>	Project (Number/Name) 67A018 / <i>SF Weather Services Research</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>inform satellite operators of hazards and the impacts of those hazards to their spacecraft that will provide warfighters with the environmental awareness to safely sustain their respective orbits and missions.</p> <p>FY 2024 Plans: Development activities include integration of software into the Space Environment Toolkit for Defense (SET4D) baseline that includes decomposing, developing, testing, and validating software applications that support the prediction/forecasting processors for global geomagnetic, auroral and solar activities that impact satellite, communication, radar, high flyer, and intelligence operations. The contractor will perform integration and cloud migration efforts of prototype tools of a Technology Readiness level (TRL) 6 or higher from the Air Force Research Lab (AFRL), Atmospheric Environmental Research Corporation (AER), Boston College (BC), and John Hopkins University/Applied Physics Lab (JHU/APL) for integration into the SET4D baseline that give DOD customer's customized tools for performing space environment characterization for the different layers of the atmosphere. AFRL's Radio Frequency Ionospheric Scintillation Analysis tool (RISA v1 and v2) requires integration into the SET4D baseline and will produce a Global four-dimensional Specification Product, a communications link Outage Map Product, and a ground-to-sky outage SkyMap Product. Boston College developed Constellation Observing System for Meteorology, Ionosphere and Climate 2 (COSMIC2). Additional AFRL tools such as Solar Indices Forecasting Tool (SIFT), Air Force Data Assimilative Photospheric Flux Transport (ADAPT), Solar Radio Burst (SRB) forecast, Radiation Exposure (RADEX), and the International Reference Ionosphere (IRI) 2016 model that provides an empirical electron density specification or forecast (by forecasting drivers) will require integration into SET4D baseline. JHU/APL software modernization of the OVATION-Prime (aurora radar model) and the global ionospheric assimilation model (IDA4D) that replaces the Global Assimilation of Ionospheric Measurements (GAIM) will require integration into the SET4D baseline. The contractor will develop SET4D metrics that track performance of all the SET4D applications and perform raw data qualitative analysis to ensure the applications can discern good data from bad data in the final products. The contractor will perform integration of the Wideband Model (WBMOD) software in support of scintillation climatology characterization for Electromagnetic Induction (EMI) attribution of the DOD's ground and space assets for improved space situational awareness. Lastly, the contractor will address any carry-over of Continuous Improvement/Continuous Development (CI/CD) activities for space environment characterization algorithm improvements.</p> <p>FY 2025 Plans: Continue software upgrades into the Space Weather Analysis and Forecast System (SWAFS) version 2.x baseline that supports the deployment of the Satellite Anomaly Assess tool, which includes Solar Indices Forecasting Tool (SIFT) and ECP-HAS forecast model integration analysis tool. As well as the Environmental Effects to DoD communications tool, Ionospheric Data Assimilation - four dimensional (IDA-4D) model. This work includes decomposing, developing, testing, and validating software applications for prediction/forecasting processors for global environmental effects to DoD satellites and communications spectrum. Model environmental effects to DoD satellites and develop an operator user tool and on-board additional data sets required to effectively execute the user application. Develop and deploy updates to the operator user tool and environmental models that support DoD</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203940SF / <i>Space Situation Awareness Operations</i>	Project (Number/Name) 67A018 / <i>SF Weather Services Research</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Long-Haul communications systems and environmental impacts to radar operations specifically supported by IDA-4D. Incorporate prototyping efforts provided from the Space Force Weather Services Research. RDT&E, BA 04, PE 0604002S, Project 645353 for transition into the SWAFS future code baseline utilizing the Continuous Improvement/Continuous Development (CI/CD) process to rapidly integrate environmental impact codes. Additional AFRL tools such as Solar Indices Forecasting Tool (SIFT), Air Force Data Assimilative Photospheric Flux Transport (ADAPT), Solar Radio Burst (SRB) forecast, and Radiation Exposure (RADEX), will require integration into SET4D baseline. Lastly beginning efforts to apply operational metrics to environmental assessment tools to provide a near real time assessment that will be incorporated into the CI/CD process.</p> <p>Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to progress incorporating space weather model updates.</p>			
Accomplishments/Planned Programs Subtotals	3.144	3.931	3.121

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
• SPAF 01 SPCMOD: <i>Space Mods</i>	5.155	3.221	3.088	-	3.088	3.182	3.267	3.336	3.403	0.000	24.652
• 0604002SF: <i>Space Force Weather Services Research</i>	0.816	0.849	0.867	-	0.867	0.888	0.906	0.938	0.957	0.000	6.221

Remarks

D. Acquisition Strategy
SF Weather Services Research uses CI/CD approach to rapidly deliver capabilities using multiple contracts to support a family of systems through development, fielding and sustainment.

Cost Plus contracts are utilized for software development and sustainment and Fixed Firm Price contracts for Commercial-off-the-shelf (COTS) systems and Contract Logistics Support (CLS) efforts that were pre-competed via General Services Administration (GSA).

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203940SF / <i>Space Situation Awareness Operations</i>	Project (Number/Name) 67A018 / <i>SF Weather Services Research</i>

	FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Weather Service																												
International Reference Ionosphere (IRI)					██████████																							
Radiation Exposure (RADEX)					████████████████████																							
RISA & COSMIC					██████████																							
Solar Radio Burst (RISA & COSMIC) Forecast					████████████████																							
Air Force Data Assimilative Photospheric Flux Transport (ADAPT)					██████████																							
Solar Indices Forecasting Ionospheric Scintillation (SIFT) Analysis					████████████████████																							
ECP-HAS Forecast Model Integration									██																			
JHU-APL IDA-4D Model Integration									██████████																			
Metrics development & integration for all models, data and apps									██																			
High Frequency Communication forecasts									██																			

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1203940SF / <i>Space Situation Awareness Operations</i>	Project (Number/Name) 67A018 / <i>SF Weather Services Research</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Weather Service</i>				
International Reference Ionosphere (IRI)	1	2024	4	2024
Radiation Exposure (RADEX)	1	2024	4	2025
RISA & COSMIC	1	2024	4	2024
Solar Radio Burst (RISA & COSMIC) Forecast	1	2024	2	2025
Air Force Data Assimilative Photospheric Flux Transport (ADAPT)	1	2024	4	2024
Solar Indices Forecasting Ionospheric Scintillation (SIFT) Analysis	1	2024	4	2025
ECP-HAS Forecast Model Integration	2	2025	2	2029
JHU-APL IDA-4D Model Integration	2	2025	2	2026
Metrics development & integration for all models, data and apps	3	2024	4	2028
High Frequency Communication forecasts	1	2025	4	2029

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1206423SF / <i>Global Positioning System III - Operational Control Segment</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	740.105	267.791	317.309	217.224	0.000	217.224	22.875	6.628	6.867	7.003	0.000	1,585.802
67A021: OCX	740.105	185.812	200.452	153.909	0.000	153.909	0.000	0.000	0.000	0.000	0.000	1,280.278
67A023: OCX Block 3F	0.000	81.979	116.857	63.315	0.000	63.315	22.875	6.628	6.867	7.003	0.000	305.524

A. Mission Description and Budget Item Justification

The Global Positioning System (GPS) is a space based Positioning, Navigation and Timing (PNT) distribution system which operates through all weather. GPS supports both civil and military users in air, space, sea and land operations. GPS is a satellite-based radio navigation system that serves military and civil users worldwide. GPS users process satellite signals to determine accurate position, velocity and time. GPS must comply with Title 10 United States Code (USC) Sec 2281 which requires that the Secretary of Defense (SECDEF) ensures the continued sustainment and operation of GPS for military and civilian purposes, and 51 USC Sec 50112, which requires that GPS complies with certain standards and facilitates international cooperation. GPS also includes the Nuclear Detonation (NUDET) Detection System (NDS). The Government is responsible for the integration of the GPS Segments such that they provide worldwide GPS capability to support the warfighter and over four billion national security, civil, Allied, and commercial GPS users.

Program Element (PE) 1206423SF funds Research, Development, Test and Evaluation (RDT&E) for the Next Generation Operational Control System (OCX), which includes OCX Blocks 0, 1, and 2, and the upgrade to OCX called OCX Block 3F (OCX 3F), which incorporates Regional Military Protection (RMP) and command and control functionality for GPS III Follow-on (GPS IIIF) satellites. GPS Enterprise Integrator (EI) activities are systems engineering and integration activities conducted across the space, user, and ground segments. This activity formerly resided in the OCX PE and was switched to the GPS III Follow-on (GPS IIIF) PE in FY 2023.

OCX acquisition was established to 1) provide command and control of legacy and GPS III satellites, 2) incorporate situational awareness to support Navigation Warfare (NAVWAR) and signal monitoring, 3) enable mission capability upgrades to support a warfighter effects-based approach to operations, and 4) integrate Department of Defense (DoD) information assurance and cybersecurity controls and capabilities. OCX 3F will upgrade OCX to provide RMP, a high-powered military signal which strengthens U.S. and allied forces' GPS resiliency in contested on tested environments to mitigate future jamming threats. OCX 3F also provides the ability to rapidly reconfigure GPS IIIF satellites to create time-critical warfighter effects.

OCX and OCX 3F funds support efforts such as engineering studies and analyses, architectural engineering studies, trade studies, technology needs forecasting, modernization initiatives, systems engineering, system development, resolving obsolescence issues, test and evaluation efforts, pre-operational support activities, and interim contractor support. These activities support upgrades and product improvements for military and civil applications necessary to enable efforts to protect the United States Military and Allies' use of GPS. Additionally, funds ensure OCX and OCX Block 3F efforts meet Joint Requirements Oversight Council (JROC) approved required capabilities.

OCX Block 1 and 2 primary development concludes at system acceptance executed via DoD Form DD 250 (planned for late 4th Quarter FY 2024). Pre-Operational Support (pre-ops acceptance) and Interim Contractor Support (ICS) (post-ops acceptance) is the final contract phase that completes development, achieves the

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1206423SF / <i>Global Positioning System III - Operational Control Segment</i>
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program's final Acquisition Program Baseline (APB) milestone Ready to Transition to Operations (RTO), supports Operational Acceptance (OA), and transitions OCX to long-term sustainment. Specifically, ICS provides contractor support services to sustain and provide capability insertions, maintain system performance requirements, and participate in government led events such as maintenance, integrated supply support, security, and launch activities. RDT&E funded government activities include Development Test and Evaluation (DT&E), GPS Constellation Transfer (CTX), Operational Test and Evaluation (OT&E), and OA. Upon completion of those activities, OCX will prepare for, and transition to O&M funded Contractor Logistics Support (CLS). In FY 2023, the contractor conducted ICS proposal activities in preparation for contract modification for the final contract phase planned in FY 2024.

OCX 3F, which achieved Milestone B May 2022, is required to launch and operationally command and control GPS IIF space vehicles. OCX 3F will upgrade OCX with new capabilities to synchronize with GPS IIF Space Segment and Military GPS User Equipment (MGUE) Increment 2 capabilities. This includes master control station development, GPS system simulator modification, launch and mission planning development, training simulators, integrated logistics support products, test resources, systems engineering required to meet the Government's obligations to the international, military and civil communities, and system requirements verification. OCX 3F will maintain backward compatibility to support the legacy constellation develop solutions necessary to command, control and monitor GPS IIF, to include integration of RMP high power regional M-code signals, rapid warfighter effects and support to GPS auxiliary payloads.

This PE may include necessary civilian pay expenses required to manage, execute, and deliver OCX and OCX 3F weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in PEs 1206392SF and 1206398SF.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	277.052	317.309	82.385	0.000	82.385
Current President's Budget	267.791	317.309	217.224	0.000	217.224
Total Adjustments	-9.261	0.000	134.839	0.000	134.839
• 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	-9.261	0.000			
• Other Adjustments	0.000	0.000	134.839	0.000	134.839

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force Date: March 2024

Appropriation/Budget Activity
3620F: Research, Development, Test & Evaluation, Space Force I BA 7:
Operational Systems Development

R-1 Program Element (Number/Name)
PE 1206423SF I Global Positioning System III - Operational Control Segment

Change Summary Explanation

FY 2025: +\$134.425M to fix ICS must pay support to global monitoring stations, OCX SW (Software) updates, cyber patches, augmented crew ops, and OT&E (Operational Test & Evaluation) effort. Supports GPS constellation & maintains space/user segment alignment. Achieves OA and supports transition to Contractor Logistic Support (CLS).

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1206423SF / <i>Global Positioning System III - Operational Control Segment</i>	Project (Number/Name) 67A021 / OCX
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
67A021: OCX	740.105	185.812	200.452	153.909	0.000	153.909	0.000	0.000	0.000	0.000	0.000	1,280.278
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Prior Years Funding \$4,366.725M was executed in PE 1206423F.

A. Mission Description and Budget Item Justification

The Global Positioning System (GPS) is a space based Position, Navigation and Timing (PNT) distribution system which operates through all weather. This project funds the research and development for the Next Generation Operational Control System (OCX). This includes, but is not limited to: advanced concept development, systems engineering and analysis, modernized control segment and mission planning development, modernization/deployment of 17 monitor stations, training simulators, integrated logistics support products, and test resources.

OCX acquisition was established to: 1) provide command and control of legacy and GPS III satellites; 2) incorporate situational awareness to support Navigation Warfare (NAVWAR) and signal monitoring; 3) enable mission capability upgrades to support a warfighter effects-based approach to operations; and 4) integrate DoD information assurance and cybersecurity controls and capabilities. OCX funds will support efforts such as engineering studies and analyses, architectural engineering studies, trade studies, technology needs forecasting, technology development, systems engineering, system development, test and evaluation efforts, pre-operational support activities, and interim contractor support, in support of upgrades and product improvements for military and civil applications necessary to support efforts to protect the United States military and Allies' use of GPS. Additionally, funds will ensure efforts to meet Joint Requirements Oversight Council (JROC) approved required capabilities.

OCX Block 0 is the Launch and Checkout System (LCS) intended to conduct Launch and Early Orbit (LEO) operations and the on-orbit checkout of all GPS III satellites. The 2nd Space Operations Squadron (2SOPS) can also call upon OCX Block 0 capabilities at any time to support GPS III anomaly resolution activities. OCX Block 0 is a subset of OCX Block 1.

OCX Block 1 fields the operational capability to control all legacy satellites, the legacy civil signal (L1C/A), the legacy military signals (L1P(Y), L2P(Y)) as well as the GPS III satellites and the modernized civil signal (L2C) and the aviation safety-of-flight signal (L5). In addition, Block 1 will field the basic operational capability to control the modernized military signals (L1M and L2M M-Code), and the globally compatible signal (L1C). It also fully meets information assurance/cyber defense requirements.

OCX Block 2 fields the advanced operational capability to control the advanced features of the modernized military signals (L1M and L2M M-Code). Blocks 1 & 2 are being delivered concurrently as a result of the Oct 2016 Nunn-McCurdy review.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: OCX Development	170.012	185.391	144.717

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1206423SF / <i>Global Positioning System III - Operational Control Segment</i>	Project (Number/Name) 67A021 / OCX

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Description: Development of OCX system to launch GPS III, operate a mixed GPS II and GPS III constellation, and provide for a robust Information Assurance system.</p> <p>FY 2024 Plans: Continue contractor support of the OCX Block 0 baseline that is supporting the launch checkout, and anomaly support for GPS III satellites. For Blocks 1/2, address and resolve technical challenges that have delayed completion of formal qualification and system acceptance testing and DD250 into 4th Quarter FY 2024; also study and implement updates and operational procedures to meet the intent of multiple Positioning Signal Integrity and Continuity Assurance (PSICA) related requirements. In support of those activities, continue software fixes, version updates, software patches, and support the global monitor stations. Prepare closeout activities post-DD250 for applicable contract line items. Begin activities to achieve Blocks 1/2 OA. Planned activities include: Development Testing (Integrated System Test 3-1 (IST 3-1)), contractor performed crew operations, supporting additional crew, training, performing transition rehearsals that validate the procedures to transition the GPS satellite constellation to OCX, transferring the GPS Constellation from the legacy Operational Control System (OCS) to OCX, troubleshooting issues and/or rectifying deficiency reports levied by the operational community in connection with Operational Test and Evaluation (OT&E), and conducting OT&E that culminates with Operational Acceptance (OA). Award and begin Pre-Operational Support (pre-ops acceptance) and Interim Contractor Support (ICS) activities for OCX Block 0 and Blocks 1/2. Pre-Operational support activities occur with the program office's system acceptance via DD250 but prior to the warfighter's OA. The contractor will provide extensive critical support to certify OCX as ready for Operational Testing (OT): training, demonstrations, readiness campaigns, and enterprise level tests among ground, space, and users. Continue to rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to: program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p>FY 2025 Plans: Focus on completing Pre-Ops Support/ICS contract line items (i.e., on-going ICS for OCX Blocks 0 and Blocks 1/2). Continue supporting the launch checkout and anomaly resolution of GPS III satellites. Continue to perform maintenance activities for Blocks 1 and 2, provide contractor staff to support government activities, and conduct pre-planned system updates to align ground capabilities with GPS enterprise changes involving the space and user segments. Complete activities to achieve Blocks 1/2 OA such as Factory Engineering, Development Testing (Integrated System Test 3-1 (IST 3-1)), contractor performed crew operations, supporting additional crew, training, performing transition rehearsals that validate the procedures to transition the GPS satellite constellation to OCX, transferring the GPS Constellation from the legacy Operational Control System (OCS) to OCX, troubleshooting issues and/or rectifying deficiency reports levied by the operational community in connection with Operational Test and Evaluation (OT&E), and conducting OT&E that culminates with OA. Upon OA and transition to ICS, the contractor will continue maintenance and pre-planned system updates providing contractor crew operators, support to crew training, and support for other GPS constellation activities. Rapidly respond to implement system resiliency and situational awareness necessary to</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1206423SF / <i>Global Positioning System III - Operational Control Segment</i>	Project (Number/Name) 67A021 / OCX

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.			
FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to ramp-down of OCX development activity and system delivery to support pre-operations.			
Title: Technical Support	15.800	15.061	9.192
Description: Development of the Standardized Space Trainer (SST) to provide GPS III operator training. Development of Enterprise Mission Planning Systems. Facilities upgrades for Control Stations and associated equipment and servers. Systems Engineering (SE) including Technical Mission Analysis (TMA), Modernization SE and Technical Support, and Test and Evaluation (T&E).			
FY 2024 Plans: Continue data collection and tuning of the monitoring stations equipment as needed. Continue witnessing contractor testing in support of system acceptance. Perform SE and technical support and analysis for planning government led development testing, and operational acceptance testing. Provide contract technical support and assistance as required. Continue support towards OCX Block 1 and 2 Ready to Transition to Operation milestone.			
FY 2025 Plans: Complete data collection and tuning of the monitoring stations equipment as needed. Complete Systems Engineering and technical support and analysis for Government led testing, and operational demonstrations, exercises, and training. Assist with plans for transition to sustainment, provide contract technical support, and assist with closeout activities as required.			
FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to ramp down of technical support effort after system delivery.			
Accomplishments/Planned Programs Subtotals	185.812	200.452	153.909

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u> <u>Base</u>	<u>FY 2025</u> <u>OCO</u>	<u>FY 2025</u> <u>Total</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>FY 2029</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• RDTE 07 1203265F: <i>GPS III Space Segment</i>	1.467	0.000	0.000	-	0.000	0.000	0.000	0.000	-	0.000	1.467
• RDTE 05 1203269SF: <i>GPS III Follow-on</i>	232.783	247.278	181.057	-	181.057	124.075	93.555	61.027	35.989	142.362	1,118.126

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force									Date: March 2024		
Appropriation/Budget Activity 3620F / 7				R-1 Program Element (Number/Name) PE 1206423SF / <i>Global Positioning System III - Operational Control Segment</i>				Project (Number/Name) 67A021 / OCX			

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2023	FY 2024	FY 2025	FY 2025	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	Cost To	
			Base	OCO	Total					Complete	Total Cost
• SPSF 01 GPSIII: <i>GPS III Space Segment</i>	103.340	121.770	68.205	-	68.205	29.723	2.812	0.000	0.000	0.000	325.850
• SPSF 01 GPS03C: <i>GPSIII Follow On</i>	616.962	119.700	647.165	-	647.165	710.019	744.030	759.736	775.039	1,358.809	5,731.460

Remarks

D. Acquisition Strategy

The Space Force is pursuing a "Block" approach for OCX in order to respond to warfighter capability requirements. Enterprise studies will ensure GPS Enterprise synchronization across space and ground segments.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1206423SF / <i>Global Positioning System III - Operational Control Segment</i>	Project (Number/Name) 67A021 / OCX
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
GPS OCX Phase B OCX Block 1 & 2 Development	C/CPAF	Raytheon : Aurora, CO	522.315	153.997	Oct 2022	154.751	Oct 2023	-		-		-	0.000	831.063	4,062.303
GPS OCX Pre Operational and Interim Contractor Support	SS/CPIF	Raytheon : Aurora, CO	0.000	2.973	Sep 2023	14.505	May 2024	132.691	Oct 2024	-		132.691	0.000	150.169	-
GPS OCX SBIR/STTR	Various	Various : Various	0.000	-		7.216	Mar 2024	5.541	Mar 2025	-		5.541	0.000	12.757	-
GPS OCX Block 3F Development	Various	Various : Various	131.019	-		-		-		-		-	0.000	131.019	-
GPS OCX Technical Mission Analysis	Various	Various : Various	21.148	6.319	Nov 2022	3.540	Nov 2023	2.718	Nov 2024	-		2.718	0.000	33.725	-
GPS OCX Enterprise SE&I	C/CPAF	TASC : El Segundo, CA	14.031	1.093	Nov 2022	0.536	Nov 2023	0.523	Nov 2024	-		0.523	0.000	16.183	-
GPS OCX Modernization/ SE & Tech Support	Various	Various : Various	6.364	9.481	Nov 2022	10.522	Nov 2023	6.474	Nov 2024	-		6.474	0.000	32.841	-
GPS OCX Standardized Space Trainer (SST)	C/CPAF	Sonalyst, Inc. : Waterford, CT	6.316	-		-		-		-		-	0.000	6.316	-
GPS OCX Enterprise Mission Planning	MIPR	Various : Various	11.700	-		-		-		-		-	0.000	11.700	-
Subtotal			712.893	173.863		191.070		147.947		-		147.947	0.000	1,225.773	N/A

Test and Evaluation (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
GPS OCX T&E	C/Various	Various : Various	4.355	0.000	Nov 2022	1.000	Nov 2023	-		-		-	0.000	5.355	-
Subtotal			4.355	0.000		1.000		-		-		-	0.000	5.355	N/A

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1206423SF / <i>Global Positioning System III - Operational Control Segment</i>	Project (Number/Name) 67A021 / OCX

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
OCX				
Block 0 / 1 / 2 Pre-operational Support and Interim Contractor Support	4	2023	4	2025
DD250	4	2024	4	2024
Contract Closeout	3	2024	4	2025
System Acceptance Test (SAT)	3	2024	3	2024
OCX Block 1 Ready to Transition to Operations (RTO)	3	2025	3	2025
Operational Acceptance (OA)	1	2026	1	2026

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1206423SF / <i>Global Positioning System III - Operational Control Segment</i>	Project (Number/Name) 67A023 / <i>OCX Block 3F</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
67A023: <i>OCX Block 3F</i>	0.000	81.979	116.857	63.315	0.000	63.315	22.875	6.628	6.867	7.003	0.000	305.524
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

OCX Block 3 Follow-on (OCX 3F) will modify OCX Command and Control (C2) for new Global Positioning System (GPS) III Follow-On (GPS IIIF) satellites and Military GPS User Equipment (MGUE) system capabilities, including Regional Military Protection (RMP) high-powered military signal to strengthen U.S. and allied forces' GPS resiliency in contested environments to mitigate future threats, and the ability to rapidly reconfigure GPS IIIF satellites to create time-critical warfighter effects. OCX 3F will maintain backward compatibility with the existing OCX capabilities to support the legacy GPS constellation as well as GPS IIIF. OCX 3F includes critical functions necessary to launch, command, control, and monitor GPS IIIF spacecraft, collect and integrate RMP high-power regional Military Code (M-Code) signals for rapid warfighter effects, and support GPS IIIF auxiliary payloads, including Search and Rescue (SAR) and Nuclear Detonation (NUDET) Detection System (NDS).

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: OCX Block 3F	81.979	116.857	63.315
<p>Description: OCX Block 3F upgrades OCX Block 1 & 2 with new capabilities in support of GPS IIIF and incorporate RMP to handle future threats. OCX 3F will maintain backward compatibility to support the legacy constellation develop solutions necessary to command, control and monitor GPS IIIF, to include advance collection and integration of RMP high power regional M-code signals, rapid warfighter effects and support to GPS auxiliary payloads.</p> <p>FY 2024 Plans: Deliver initial OCX 3F Launch and Checkout System (LCS) software to support enterprise integration risk reduction events with GPS IIIF space vehicles. Initiate refresh of LCS hardware to support Enterprise events. Continue system development, integration and test, and training capabilities to support GPS IIIF launch, checkout, and on-orbit operations. Continue software coding and development of C2 capabilities for RMP and RWE. Finalize accreditation of and complete upgrades to the OCX 3F GPS System Simulator and work on development of the Global Positioning, Navigation, and Timing (PNT) critical capability. Support GPS Systems Integration (SI) Demonstrations to mitigate risks for key interfaces and functionality between the GPS space, ground and user equipment segments. Continue cybersecurity resiliency development and test and support Tabletop exercises to identify and mitigate cybersecurity threats. Incorporate Enterprise Mission Planning Systems capability into OCX 3F baseline. The Enterprise Mission Planning Systems enable Over the Air Rekey capability and other navigation warfare effects taskings. Develop OCX 3F upgrades for SST to support OCX 3F C2 operator training. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to: program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p>FY 2025 Plans:</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1206423SF / <i>Global Positioning System III - Operational Control Segment</i>	Project (Number/Name) 67A023 / <i>OCX Block 3F</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Complete software development for C2 capabilities for Global PNT, Regional Military Protection (RMP) checkout and RWE initial operations. Continue integration activities that support the validation of requirements with use of the OCX 3F GPS System Simulator. Initiate and complete functional and physical control audits for final delivery of OCX 3F baseline. Prepare and begin coordination for System Integration Testing (SIT) of OCX 3F into the Operationally Accepted (OA) OCX baseline. Continue to support early GPS Enterprise integration testing in support of Mission Readiness Campaign (MRC) for GPS III F SV-11. Continue to incorporate Enterprise Mission Planning Systems capability into OCX 3F baseline. The Enterprise Mission Planning Systems enable Over the Air Rekey capability and other navigation warfare effects taskings. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased due to software development activities ramp down for integration and testing efforts.</p>			
Accomplishments/Planned Programs Subtotals	81.979	116.857	63.315

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
• SPSF 01 GPSIII: <i>GPS III Space Segment</i>	103.340	121.770	68.205	-	68.205	29.723	2.812	0.000	0.000	0.000	325.850
• SPSF 01 GPS03C: <i>GPS III Follow On</i>	616.962	119.700	647.165	-	647.165	710.019	744.030	759.736	775.039	1,358.809	5,731.460
• RDTE 07 1203265F: <i>GPS III Space Segment</i>	1.467	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.467
• RDTE 05 1203269SF: <i>GPS III Follow-On (GPS III F)</i>	232.783	247.278	181.057	-	181.057	124.075	93.555	61.027	35.989	142.362	1,118.126

Remarks

D. Acquisition Strategy

OCX Block 3F is a separate, tailored Acquisition Category (ACAT) II program. It is part of the overall GPS Enterprise Modernization effort. The OCX 3F development contract was awarded sole source to Raytheon Intelligence and Space in 3rd Quarter FY 2021. The OCX 3F program uses an agile software development approach to upgrade the OCX system to support the first GPS III F satellite launch, while also maintaining backwards compatibility for C2 of the existing GPS satellite constellation.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1206423SF / <i>Global Positioning System III - Operational Control Segment</i>	Project (Number/Name) 67A023 / <i>OCX Block 3F</i>
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
OCX 3F Development	C/CPAF	Raytheon : Aurora, CO	0.000	66.659	Oct 2022	86.906	Oct 2023	43.379	Oct 2024	-		43.379	Continuing	Continuing	-
OCX 3F SBIR/STTR	Various	Various : Various	0.000	-		4.090	Mar 2024	2.279	Mar 2025	-		2.279	Continuing	Continuing	-
OCX 3F Technical Mission Analysis	Various	Various : Various	0.000	3.859	Nov 2022	4.589	Nov 2023	3.142	Nov 2024	-		3.142	Continuing	Continuing	-
OCX 3F Enterprise SE&I	C/CPAF	TASC : El Segundo, CA	0.000	0.622	Nov 2022	2.890	Nov 2023	1.268	Nov 2024	-		1.268	Continuing	Continuing	-
OCX 3F Enterprise Mission Planning	MIPR	Various : Various	0.000	2.700	Jan 2023	7.000	Jan 2024	2.000	Jan 2025	-		2.000	Continuing	Continuing	-
OCX 3F Modernization/SE & Tech Support	Various	Various : Various	0.000	-		1.214	Nov 2023	3.322	Nov 2024	-		3.322	Continuing	Continuing	-
OCX 3F Standardized Space Trainer (SST)	C/CPAF	Sonalyt, Inc : Waterford, CT	0.000	-		3.471	Feb 2024	3.193	Nov 2024	-		3.193	Continuing	Continuing	-
Subtotal			0.000	73.840		110.160		58.583		-		58.583	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
OCX 3F FFRDC	RO	Aerospace : El Segundo, CA	0.000	0.775	Oct 2022	1.041	Oct 2023	1.059	Oct 2024	-		1.059	Continuing	Continuing	-
OCX 3F A&AS	Various	Various : Various	0.000	7.246	Nov 2022	5.356	Nov 2023	3.373	Nov 2024	-		3.373	Continuing	Continuing	-
OCX 3F Other Support	Various	Various : Various	0.000	0.118	Oct 2022	0.300	Oct 2023	0.300	Oct 2024	-		0.300	Continuing	Continuing	-
Subtotal			0.000	8.139		6.697		4.732		-		4.732	Continuing	Continuing	N/A

	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals		0.000	81.979	116.857	63.315	-	63.315	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1206423SF / <i>Global Positioning System III - Operational Control Segment</i>	Project (Number/Name) 67A023 / <i>OCX Block 3F</i>

	FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
OCX Block 3F																												
OCX 3F GPS System Simulator																												
OCX 3F Core Software Development																												
OCX 3F Support GPS IIF Integration Exercises																												
OCX 3F Satellite Integration Launch Readiness																												
OCX 3F Satellite Integration Ops Test																												
OCX 3F Deploy to Master Control Station (MCS) Operations																												
OCX 3F Contract Closeout																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1206423SF / <i>Global Positioning System III - Operational Control Segment</i>	Project (Number/Name) 67A023 / <i>OCX Block 3F</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
OCX Block 3F				
OCX 3F GPS System Simulator	1	2023	3	2024
OCX 3F Core Software Development	1	2023	2	2025
OCX 3F Support GPS IIIF Integration Exercises	2	2023	4	2025
OCX 3F Satellite Integration Launch Readiness	1	2026	4	2028
OCX 3F Satellite Integration Ops Test	1	2026	4	2028
OCX 3F Deploy to Master Control Station (MCS) Operations	2	2026	2	2026
OCX 3F Contract Closeout	4	2028	2	2029

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1206770SF / <i>Enterprise Ground Services</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	130.148	155.825	111.284	0.000	111.284	107.652	109.711	114.754	117.613	Continuing	Continuing
673140: <i>Enterprise Ground Services EGS</i>	-	130.148	155.825	111.284	0.000	111.284	107.652	109.711	114.754	117.613	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In February 2023, the Assistant Secretary of the Air Force for Space Acquisition and Integration directed the formation of a Combined Program Office (CPO) by merging Enterprise Ground Services (EGS) from Space Systems Command (SSC) and Ground Command, Control, and Communications (GC3) from the Space Rapid Capabilities Office (Space RCO). The newly formed CPO is called the Rapid Resilient Command and Control (R2C2) CPO, using Space RCO acquisition authorities under the Space RCO Program Executive Officer to execute funding in the EGS and GC3 program elements to develop an extensible, scalable, modular ground segment solution capable of supporting dynamic space operations missions of the United States Space Force. Combined EGS and GC3 funding will be used wholly and directly to support CPO operations. R2C2 will continue development and integration of the satellite operations ground segment solution (SatOps) to support the dynamic space operations mission set, including, but not limited to, capabilities and services needed to perform command and control (C2) functions.

The appropriate Congressional Committees were briefed on the associated program changes and acquisition strategy beginning in FY 2023.

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

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1206770SF / <i>Enterprise Ground Services</i>
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B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	123.251	155.825	137.645	0.000	137.645
Current President's Budget	130.148	155.825	111.284	0.000	111.284
Total Adjustments	6.897	0.000	-26.361	0.000	-26.361
• 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	11.150	0.000			
• SBIR/STTR Transfer	-4.253	0.000			
• Other Adjustments	0.000	0.000	-26.361	0.000	-26.361
 Change Summary Explanation					
FY 2023: +11.150M above threshold reprogramming and -4.253M for SBIR/STTR.					
FY 2025: Decrease is due to realignment of funds to higher priority requirements.					

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
Title: Rapid Resilient Command and Control (R2C2) Development	66.814	100.521	72.041
Description: Develop and integrate common SatOps C2 services in cloud environments. Refine standards and interfaces, develop and implement cybersecurity and cryptography requirements, develop training, address Zero Trust, mature antenna network services and connectivity, and integrate capabilities into the enterprise. Support mission partner demonstrations, integration, and test of mission-unique software.			
FY 2024 Plans: Continued development, integration, and deployment of enterprise SatOps C2 services, such as flight dynamics and associated standards and interfaces for Research and Development Space and Missile Operations (RDSMO) and dynamic space operations mission partners. Continued deployment of cybersecurity, cryptography, and security architectures to support dynamic space operations capabilities. Continued integration and testing with mission-partner developed unique software to meet end-to-end C2 requirements. Continued growth of infrastructure and network connectivity to support mission partners. Continued maturing of cloud architectures and Distributed Software Integration Labs (dSIL) in support of dynamic space operations. Continued development of antenna networking services to enable mission planning and scheduling for commercial and government antennas. Continued integration of developed capabilities with the dynamic space operations enterprise. Expansion of R2C2			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1206770SF / <i>Enterprise Ground Services</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Development to a growing number of mission partners integrating and operating with R2C2, including RDSMO and dynamic space operations mission partners. Continued risk reduction demos for R2C2 capabilities.</p> <p>Compared to the FY24PB amount of \$78.268M for this effort, the current FY24 funding reflects a \$22.253M increase for continuing and expanded efforts as noted above.</p> <p>FY 2025 Plans: Continue development, integration, and deployment of enterprise SatOps C2 services, such as flight dynamics and associated standards and interfaces for RDSMO and dynamic space operations mission partners. Continue deployment of cybersecurity, cryptography, and security architectures to support dynamic space operations capabilities. Continue integration and testing with mission-partner developed unique software to meet end-to-end C2 requirements. Continue growing infrastructure and network connectivity to support mission partners. Continue maturing a commercial cloud architecture in support of dynamic space operations. Continue development of antenna networking services to enable mission planning and scheduling for commercial and government antennas. Continue integration of developed capabilities with the dynamic space operations enterprise. Continue risk reduction demos as test assets become available and deliver R2C2 Article 1.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 Development funding decreased due to realigning funds to other Space Force priorities.</p>			
<p>Title: R2C2 Pre-Operations (Pre-Ops) Support</p> <p>Description: Maintain hardware and software baselines, update software licenses, integrate cybersecurity, and provide help-desk operations with associated training.</p> <p>FY 2024 Plans: Continued scaling pre-ops support activities and facilities for increasing number of mission partners using R2C2 capabilities. Continued maintaining hardware and software baselines for R2C2 capabilities, hosted on cloud environments, maintained software licenses, and continued 24x7 help desk operations, associated training, and cybersecurity support. R2C2. Continued improving service center capabilities to support mission partners developing, integrating, testing, and operating with R2C2. Accomplished infrastructure technical refresh, patching, and cybersecurity updates. Expanded Pre-Ops support to a growing number of mission partners integrating and operating with R2C2, including RDSMO and dynamic space operations mission partners. Continued support of antenna networking services.</p> <p>Compared to the FY24PB amount of \$31.477M for this effort, the current FY24 funding reflects a \$23.827M increase for continuing and expanded efforts as noted above.</p> <p>FY 2025 Plans:</p>	10.417	55.304	39.243

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1206770SF / <i>Enterprise Ground Services</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Continue pre-ops support activities and facilities for dynamic space operations mission partners using R2C2 SatOps ground segment services to include maintaining software baselines, expanding commercial cloud environments, supporting private cloud environments, updating software licenses, facilitating user engagements, and continuing 24x7 help desk operations, associated training, and cybersecurity support. Continue service center capabilities to support mission partners developing, integrating, testing, and operating R2C2 SatOps services. Accomplish necessary infrastructure technical refresh, patching, and cybersecurity updates. Continue support of antenna networking services.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 Pre-Ops funding decreased due to realigning funds to other Space Force priorities.</p>			
<p>Title: R2C2 Deployment</p> <p>Description: Rapidly deploy the SatOps ground segment solution to support dynamic space operations mission set.</p> <p>FY 2024 Plans: N/A. FY 2024 funds realigned to other efforts to support pivot to dynamic space operations mission set.</p> <p>FY 2025 Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: N/A. FY 2024 and FY 2025 R2C2 Deployment funding realigned to Development and Pre-Ops efforts to support pivot to dynamic space operations mission set, in accordance with revised acquisition strategy.</p>	52.917	0.000	0.000
Accomplishments/Planned Programs Subtotals	130.148	155.825	111.284

D. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

E. Acquisition Strategy
The R2C2 Combined Program Office (CPO) has an approved acquisition strategy to award contracts under a small business, multiple award Indefinite Delivery / Indefinite Quantity in FY 2024 to operationalize the SatOps ground segment solution and provide pre-ops support for dynamic space operations mission partners. The Service Acquisition Executive approved this revised strategy after the Department submitted FY 2024 budget documentation. FY 2023 funding is revised to reflect an approved above threshold reprogramming supporting this new strategy, and FY 2024 funding is revised to reflect the updated acquisition strategy.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1206770SF / Enterprise Ground Services	Project (Number/Name) 673140 / Enterprise Ground Services EGS
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
R2C2 Development	Various	Various : Various	-	52.017	Nov 2022	78.497	Nov 2023	55.976	Nov 2024	-		55.976	Continuing	Continuing	-
R2C2 Pre-Ops Support	Various	Various : Various	-	10.417	Dec 2022	49.886	Dec 2023	35.505	Dec 2024	-		35.505	Continuing	Continuing	-
R2C2 Deployment	Various	Various : Various	-	46.781	Nov 2022	0.000	Oct 2023	0.000		-		0.000	0.000	46.781	-
R2C2 Technical Mission Analysis	RO	Aerospace Corp : El Segundo, CA	-	4.175	Oct 2022	0.000	Jan 2024	0.000	Jan 2025	-		0.000	Continuing	Continuing	-
Enterprise Systems Engineering and Integration (SE&I)	Various	MITRE : Bedford, MA	-	5.615	Oct 2022	14.038	Oct 2023	10.001	Oct 2024	-		10.001	Continuing	Continuing	-
SBIR/STTR	Allot	TBD : TBD	-	-		5.454	Oct 2023	3.887	Oct 2024	-		3.887	Continuing	Continuing	-
Subtotal			-	119.005		147.875		105.369		-		105.369	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
FFRDC	RO	Aerospace Corp : El Segundo, CA	-	3.828	Oct 2022	0.872	Oct 2023	0.872		-		0.872	0.000	5.572	-
A&AS Support	Various	Various : Various	-	6.604	Dec 2022	6.748	Dec 2023	4.808	Dec 2024	-		4.808	Continuing	Continuing	-
Other Support	Various	Various : Various	-	0.711	Dec 2022	0.330	Dec 2023	0.235	Dec 2024	-		0.235	Continuing	Continuing	-
Subtotal			-	11.143		7.950		5.915		-		5.915	Continuing	Continuing	N/A

			Prior Years	FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total		Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	130.148		155.825		111.284		-		111.284	Continuing	Continuing	N/A	

- Remarks**
- FY 2025 Product Development and Management Services requirements may vary during year of execution due to integration and cybersecurity necessary to complete delivery of SatOps ground segment services for dynamic space operations mission partners.
 - EGS Pre-Ops Support transitioned to R2C2 Pre-Ops Support in FY 2023 in accordance with revised acquisition strategy.

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1206770SF / <i>Enterprise Ground Services</i>	Project (Number/Name) 673140 / <i>Enterprise Ground Services EGS</i>

	FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
R2C2 Development																												
Distributed Software Integration Lab (dSIL)																												
Catalyst Campus																												
Continuous SatOps Development & Integration																												
R2C2 Demo 1																												
R2C2 Demo 2																												
R2C2 Article 1 Delivery																												
Cloud Environments																												
R2C2 Pre-Ops Support																												
R2C2 Pre-Ops Support																												
R2C2 Deployment																												
R2C2 Deployment																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1206770SF / <i>Enterprise Ground Services</i>	Project (Number/Name) 673140 / <i>Enterprise Ground Services EGS</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
R2C2 Development				
Distributed Software Integration Lab (dSIL)	1	2023	4	2024
Catalyst Campus	1	2023	3	2023
Continuous SatOps Development & Integration	1	2023	4	2029
R2C2 Demo 1	1	2024	2	2024
R2C2 Demo 2	3	2024	3	2024
R2C2 Article 1 Delivery	2	2025	2	2025
Cloud Environments	1	2023	4	2029
R2C2 Pre-Ops Support				
R2C2 Pre-Ops Support	1	2023	4	2029
R2C2 Deployment				
R2C2 Deployment	1	2023	4	2023

Note

R2C2 milestones include initial delivery and maturation of tactical SatOps ground segment solutions for the dynamic space operations mission set. R2C2 Pre-Ops support milestones include phased initial integration of dynamic space operations mission partners. Pre-ops support is on-going.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1208053SF / <i>Joint Tactical Ground System</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	0.000	14.568	6.937	0.000	6.937	6.941	7.020	7.098	7.238	0.000	49.802
676760: <i>Joint Tactical Ground Station</i>	-	0.000	14.568	6.937	0.000	6.937	6.941	7.020	7.098	7.238	0.000	49.802
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

The Joint Tactical Ground Station (JTAGS) is a post-production, Acquisition Category (ACAT) III program. JTAGS provides missile warning message data for the Air and Missile Defense (AMD) architecture and improves performance for Integrated Air and Missile Defense Fire Control Systems/Composite Army Air and Missile Defense Brigades. JTAGS disseminates near real time warning, alerting, and cueing information on ballistic missile launches and other tactical events of interest throughout the theater using existing communication networks, providing critical support to Combatant Commanders in their Areas of Responsibility (AOR). JTAGS consist of two sheltered operation rooms, one equipment room, and three antennas. Four outside contiguous United States (OCONUS) deployed JTAGS units, which are deployed in three theaters (United States Pacific Command (PACOM), United States Central Command (CENTCOM), United States European Command (EUCOM)), constitute DoD's in-theater system providing space-based missile warning. The fifth contiguous United States (CONUS) system is used as an institutional trainer but is available as a deployable asset. JTAGS is designated as the in-theater element of the United States Strategic Command's Theater Event System (TES), supporting all Theater Missile Defense pillars, affording the shortest sensor-to-shooter connectivity. On 14 January 2016, the Army Acquisition Executive designated the JTAGS Pre-Planned Product Improvement (JTAGS P3I) program as a separate ACAT III modification program.

The JTAGS Program Element (PE) supports development and testing of the JTAGS Block II Preplanned Product Improvements (P3I) program based on the JTAGS Operational Requirements Document (ORD), additive Joint Requirements Oversight Council - Memorandum (JROC-M) requirements, and the formal JTAGS Block II Capability Development Document (CDD) thresholds. P3I upgraded JTAGS to a Block II configuration for operation with the next generation of Space Based Infrared System (SBIRS) satellites, and improved warning tactical parameters and timeliness. The JTAGS Block II P3I program based on the 2009 JTAGS ORD is on contract as a two-phase development effort. JTAGS Block II Phase 2 activities seek to develop and test capabilities identified in 2009 JTAGS Operational Requirements Document (ORD). Joint Requirements Oversight Council (JROC) Memos 197-12, 113-13, and 042-19 and PL 111-383(Ike Skelton National Defense Authorization Act for FY 2011) support the requirements to develop and field JTAGS Block II capabilities as soon as possible.

JTAGS Block II P3I Phase 1 is complete. The final developmental efforts of JTAGS Block II P3I Phase 2 to achieve 2009 ORD requirements completed in FY 2022. Follow-on Test and Evaluation (FOTE) completed in FY 2022 with Materiel Release efforts to be conducted in FY 2023. JTAGS Block II Phase 2 Spiral 3 fielding is planned for FY 2024 and FY 2025. The JTAGS Block II CDD addresses evolving User-driven needs such as emerging threats and interface efforts that were not known at the time the JTAGS ORD was validated. Developmental efforts to achieve JTAGS Block II CDD threshold requirements continue through FY28.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1208053SF / <i>Joint Tactical Ground System</i>
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FY 2025 requests funds to continue development for cyber compliance, defense against emerging threats, Assured Positioning, Navigation and Timing (APNT) and M-code GPS compliance, addresses obsolescence mitigation with Commercial Off The Shelf (COTS) hardware/software upgrades, and research and develop prototypes for various system modifications for Red Hat Linux, the next generation Joint Tactical Terminals.

The Joint Tactical Ground Station (JTAGS) transitioned to US Space Force (USSF) in FY 2024.

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

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	0.000	14.568	6.925	0.000	6.925
Current President's Budget	0.000	14.568	6.937	0.000	6.937
Total Adjustments	0.000	0.000	0.012	0.000	0.012
• 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	0.012	0.000	0.012

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
Title: Development and Test of Block II CDD requirements	0.000	14.276	6.850
Description: JTAGS Block II program continues to focus on development/integration of evolving cyber hardening advances, defense against emerging threats, and JTAGS Capability Development Document (CDD) threshold requirements. JROC-Memos 197-12, 113-13, and 042-19 and PL 111-383 (Ike Skelton National Defense Authorization Act for FY2011) require fielding of these capabilities as soon as possible.			
FY 2024 Plans: Continue development, testing and fielding of software and hardware (Spiral 3) upgrades to comply with the Joint Staff (J-6) granted Net-Ready Key Performance Parameter (NR KPP) certification in support of the Joint Tactical Ground Station (JTAGS)			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1208053SF / <i>Joint Tactical Ground System</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Pre-Planned Product Improvement (P3I) Block II Capability Development Document (CDD) requirements to deter near-peer competitors' threats.</p> <p>FY 2025 Plans: Complete development, testing and fielding of software and hardware (Spiral 3) upgrades to comply with the Joint Staff (J-6) granted Net-Ready Key Performance Parameter (NR KPP) certification in support of the Joint Tactical Ground Station (JTAGS) Pre-Planned Product Improvement (P3I) Block II Capability Development Document (CDD) requirements to deter near-peer competitors' threats. Complete development and deployment of cyber security tools to be achieve compliance with Risk Management Framework (RMF) requirements. Continue to address obsolescence mitigation with Commercial Off the Shelf (COTS) hardware/software upgrades, and research and develop prototypes for various system modifications for Red Hat Linux, the next generation Joint Tactical Terminals and capability integration across missile warning architecture.</p> <p>Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Reduction due to Block II Phase II Spiral III development nearing completion.</p>			
<p>Title: JTAGS Test and Evaluation Support</p> <p>Description: Test and evaluation support for the JTAGS program.</p> <p>FY 2024 Plans: Funding provides for Technical Manual Delta Validation and Verification Certification of the JTAGS Block II system.</p> <p>FY 2025 Plans: Funding provides for Technical Manual Delta Validation and Verification Certification of the JTAGS Block II system.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased due to continuing test and evaluation activities and inflation.</p>	0.000	0.292	0.087
Accomplishments/Planned Programs Subtotals	0.000	14.568	6.937

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 1208053SF / <i>Joint Tactical Ground System</i>
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D. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u> <u>Base</u>	<u>FY 2025</u> <u>OCO</u>	<u>FY 2025</u> <u>Total</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>FY 2029</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• SPSF 01 JTAGS0: <i>Joint Tactical Ground Station</i>	0.349	0.576	-	-	-	-	-	-	-	0.000	0.925

Remarks

The Joint Tactical Ground Station (JTAGS) transitioned to US Space Force in FY2024.

E. Acquisition Strategy

This program element develops critical software intensive improvements, while continuing to make maximum use of Non-Developmental Items (NDI)/Commercial Off-The-Shelf (COTS) components and Government Furnished Equipment (GFE). After design and integration, the system will be subject to thorough developmental and validation/verification testing to verify performance, operational effectiveness and suitability. The JTAGS Block II Pre-planned Product Improvement (P3I) program was initiated based on a 2009 JTAGS Operational Requirements Document (ORD) and upgrades JTAGS to a Block II configuration for operation with the next generation of Space Based Infrared System (SBIRS) satellites, improving warning tactical parameters and timeliness. The JTAGS Block II P3I contract was a full and open competition, but only the incumbent JTAGS contractor submitted a proposal, resulting in a sole-source contract on 26 Aug 2012. The contract's development options are Cost Plus Incentive Fee; its production options are Firm Fixed Price, and its Sustainment options are Cost Plus Fixed Fee. The JTAGS Block II contract's period of performance is from 1 October 2012 through 30 September 2021 with a contract extension to March 2022. As threats continue to evolve and change as well as new satellite sensors become available, the JTAGS Users in conjunction with the Army Capabilities Manager have developed a JTAGS Block II Capability Development Document (CDD), requiring JTAGS to address new/changing threats that were not addressed in the 2009 JTAGS ORD. The acquisition of the continued JTAGS Block II efforts based on the JTAGS Block II CDD was performed under a sole source follow-on contract awarded May 2022 to the current JTAGS contractor.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1208053SF / Joint Tactical Ground System	Project (Number/Name) 676760 / Joint Tactical Ground Station
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Development and Test Block II CDD requirements	SS/ Various	Northrup-Grumman : Colorado springs, CO	-	0.000	Nov 2023	7.829	Nov 2023	2.067	Jan 2025	-		2.067	Continuing	Continuing	-
System Engineering Support	C/CPFF	Intrepid : Huntsville, AL	-	0.000	Jan 2023	1.949	Jan 2024	0.000	Jan 2025	-		0.000	0.000	1.949	-
Subtotal			-	0.000		9.778		2.067		-		2.067	Continuing	Continuing	N/A

Remarks
Continues development of the JTAGS Block II capabilities based on the JTAGS Block II Capability Development Document (CDD)

Support (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
System Engineering Technical Assistance	C/CPFF	Intrepid : Huntsville, AL	-	0.000	Jan 2023	2.253	Jan 2024	2.312	Jan 2025	-		2.312	0.000	4.565	-
Subtotal			-	0.000		2.253		2.312		-		2.312	0.000	4.565	N/A

Remarks
Provides technical assistance in implementing the JTAGS Block II CDD

Test and Evaluation (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
JTAGS Test Support (17TES/JITC)	Allot	Various (17TES/JITC) : : Various	-	0.000	Oct 2022	0.426	Oct 2023	0.087	Oct 2024	-		0.087	Continuing	Continuing	-
Subtotal			-	0.000		0.426		0.087		-		0.087	Continuing	Continuing	N/A

Remarks
Supports testing of JTAGS Block II development efforts based on the JTAGS Block II CDD.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1208053SF / Joint Tactical Ground System	Project (Number/Name) 676760 / Joint Tactical Ground Station
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Management Services (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Government Program Management	Allot	Various(AMC,AMCOM,CDDC): : Redstone Arsenal, AL	-	0.000	Oct 2022	2.111	Oct 2023	2.471	Oct 2024	-		2.471	Continuing	Continuing	-
Subtotal			-	0.000		2.111		2.471		-		2.471	Continuing	Continuing	N/A

Remarks
Provides Other Government Agency (OGA) support to the JTAGS acquisition program

	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.000	14.568	6.937	-	6.937	Continuing	Continuing	N/A

Remarks
The Joint Tactical Ground Station (JTAGS) transitioned to USSF in FY 2024.

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	R-1 Program Element (Number/Name) PE 1208053SF / <i>Joint Tactical Ground System</i>	Project (Number/Name) 676760 / <i>Joint Tactical Ground Station</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Joint Tactical Ground Station (JTAGS) - P3I</i>				
JTAGS Block II Engineering Service Follow on Contract	1	2024	2	2025
Continued Block II CDD Emerging Threats and future sensors	1	2024	1	2025
JTAGS Block II Phase 2 Spiral 3 fielding	1	2024	4	2024
Limited User Test of Block II CDD Emerging Threat Capabilities	1	2025	1	2025
JTAGS Block II Engineering Services Contract Extension	2	2025	4	2028

Note
The Joint Tactical Ground Station (JTAGS) transitioned to US Space Force in FY 2024.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 8: Software and Digital Technology Pilot Programs</i>	R-1 Program Element (Number/Name) PE 1208248SF / <i>Space Domain Awareness/Planning/Tasking SW</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	-	191.980	122.326	157.265	0.000	157.265	138.192	131.958	136.715	139.410	Continuing	Continuing
68A035: <i>SSA/BMC2</i>	-	191.980	122.326	157.265	0.000	157.265	138.192	131.958	136.715	139.410	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The FY 2018 National Defense Authorization Act (Sections 873/874) directed the Office of the Secretary of Defense (OSD) to streamline software development. The Space Domain Awareness (SDA)/ Planning/ Tasking software program is an OSD pilot initiative in which all lifecycle funding is tracked under Budget Activity 8 (BA 8), Software and Digital Technology Pilot Programs, beginning in FY 2021. Pilot programs enable the execution of modern software development practices encompassing development, procurement, modification and maintenance activities within a single RDT&E appropriation in this PE.

In FY 2023, PE 1203614SF, JSpOC Mission System, Project 68A035 SSA/BMC2 efforts were transferred to PE 1208248SF, Enterprise Space BMC2, Project 68A035 SSA/BMC2 for SDA planning and tasking software program transparency.

The Space Force is developing a SDA planning and tasking capability for the Combined Force Space Component Command (CFSCC) and the Joint Task Force - Space Defense (JTF-SD). The SDA Planning and Tasking software program provides a collaborative environment that will enhance and modernize SDA and Battle Management Command and Control (BMC2) capabilities; create decision-relevant views of the space and multi-domain environment; rapidly detect, track and characterize objects of interest; identify / exploit traditional and non-traditional sources; perform space threat analysis; and enable efficient distribution of data across the Space Surveillance Network (SSN). The program maintains enterprise infrastructure, platform and data services, and develops mission applications to enable responsive, resilient operational-level SDA Planning and Tasking capabilities for the National Space Defense Center (NSDC), Combined Space Operations Center (CSpOC), 18th Space Defense Squadron (SDS) and other Command and Control (C2) centers. Employing an agile-based Rapid Delivery Framework with a 90-day Program Increment (PI) construct fosters a collaborative and integrated environment for the community to effectively plan and deliver C2 capabilities. The enterprise-wide system provides a common government infrastructure and processes to allow C2 capabilities at USSF operational Deltas to rapidly address the evolving and dynamic threat. The program also identifies shared/common platform, infrastructure, and data layer solutions to support open frameworks and architectures across the enterprise ground portfolio. Funding includes technical studies, development, experimentation, integration and related support costs.

In FY 2023 this Program Element also includes effort for the Cyber Halo Innovation Research Program (CHIRP) based on a Congressional add. CHIRP will continue collaboration between Space Systems Command (SSC), universities/colleges, and industry with a mission to drive innovation and to create a pipeline of talent in cyber security with the specialized expertise to protect mission-critical, space-borne assets from cyber threats by adversaries.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 8: Software and Digital Technology Pilot Programs</i>	R-1 Program Element (Number/Name) PE 1208248SF / <i>Space Domain Awareness/Planning/Tasking SW</i>
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This program is in Budget Activity 8, Software and Digital Technology Pilot Program because this budget activity includes funding provided for expenses necessary for agile development, test and evaluation, procurement, production and modification, and the operation and maintenance of these programs.

B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	155.553	122.326	123.422	0.000	123.422
Current President's Budget	191.980	122.326	157.265	0.000	157.265
Total Adjustments	36.427	0.000	33.843	0.000	33.843
• 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	41.999	0.000			
• SBIR/STTR Transfer	-5.572	0.000			
• Other Adjustments	0.000	0.000	33.843	0.000	33.843

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 68A035: *SSA/BMC2*

Congressional Add: *Cyber Halo Innovation Research Program (CHIRP) Development*

Congressional Add Subtotals for Project: 68A035

Congressional Add Totals for all Projects

	FY 2023	FY 2024
Congressional Add: <i>Cyber Halo Innovation Research Program (CHIRP) Development</i>	4.820	0.000
Congressional Add Subtotals for Project: 68A035	4.820	0.000
Congressional Add Totals for all Projects	4.820	0.000

Change Summary Explanation

FY 2023: +32.000M Above Threshold Reprogramming (ATR) and 9.999M Below Threshold Reprogramming (BTR) to fund the development and associated 24/7 support of the Advanced Tracking and Launch Analysis System (ATLAS) and the Iris bi-directional messaging interface system.

FY 2025: +30.728M for SDA Planning and Tasking to continue development and fielding of enterprise SDA C2 capability in support of Space Operations Command (SpOC). +3.115M for additional SDA C2 application development and inflation.

C. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024	FY 2025
Title: SDA Planning and Tasking Development	150.528	85.738	111.977
Description: This program delivers a robust and responsive SDA and BMC2 capability to meet emerging threats. The program will deliver capability for decision makers trying to prevent a conflict from extending to space, or winning it if it does. Capabilities and associated infrastructure include, but are not limited to, the following: SDA, Indications & Warning (I&W), Planning & Tasking,			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 8: Software and Digital Technology Pilot Programs</i>	R-1 Program Element (Number/Name) PE 1208248SF / <i>Space Domain Awareness/Planning/Tasking SW</i>
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Theater & Coalition Support, Transmit/Receive, Space Control, Tactical Operations and Common Data Management Layer, Platforms and Infrastructure; and Cyber and Threat Warning. The program maintains foundational DevSecOps enablers such as, but not limited to, Data as a Service, Zero Trust Architecture, Platform Support, Continuous Improvement/Continuous Deployment (CI/CD) toolchain, and infrastructure and inherent sustainment efforts that are an integral part of the agile software development process. Other activities include dedicated Systems Engineering & Integration (SE&I), Test & Evaluation (T&E), Model Based Systems Engineering (MBSE) and prototype Validation & Verification to support these efforts.</p> <p>FY 2024 Plans: Continue to plan and develop a message standard compliant open architecture to support both the SDA and BMC2 missions to meet dynamic emerging threats. The enterprise architecture and platform/infrastructure will modernize and deliver new capabilities in the NSDC, CSpOC, and other operations centers supporting SDA, BMC2, Theater Support, Battle Space Awareness, and Planning & Tasking & Electronic Warfare tools. Enhance the scalability, performance, and reliability of the platform. These requirements will include design, enablement services, security, services necessary for authority to operate (ATO), engineering, network and platform architecture, reliability testing, prototyping efforts to increase platform, communications, and network capabilities, data science, data engineering, reinforcement learning, machine learning, artificial intelligence, product management services. Continue development, system engineering and contracting efforts to integrate best in breed commercial, contractor, and government applications through the release of multiple incremental software capability in program increments 20-23 drops throughout FY 2024. FY 2024 funding will allow the program to implement system resiliency, cybersecurity, and situational awareness necessary to operate in the contested space domain, conduct studies to identify shared platform, infrastructure, and data layer solutions that will inform future concepts and activities in support of enterprise open frameworks and architectures, as well as risk reduction activities, technical analysis for common platform, infrastructure and data layers for ground and communication systems to build upon. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p>FY 2025 Plans: Continue to plan and develop a message standard compliant open architecture to support both the SDA and BMC2 missions to meet dynamic emerging threats. Continue product support and enhancements for operationally accepted applications, workflows, and capabilities. The enterprise architecture and platform/infrastructure will modernize and deliver new capabilities in the NSDC, CSpOC, and other operations centers supporting SDA, BMC2, Theater Support, Battle Space Awareness, and Planning & Tasking & Electronic Warfare tools. Enhance the scalability, performance, and reliability of the platform. These requirements will include design, enablement services, security, services necessary for ATO, engineering, network and platform architecture, reliability testing, prototyping efforts to increase platform, communications, network capabilities, data science, data engineering, reinforcement learning, machine learning, artificial intelligence and product management services. Expand SDA software</p>			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force		Date: March 2024		
Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 8: Software and Digital Technology Pilot Programs</i>		R-1 Program Element (Number/Name) PE 1208248SF / <i>Space Domain Awareness/Planning/Tasking SW</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>development, integration, deployment, and testing for replacement of joint legacy software systems and establish machine-to-machine interfaces for SDA event processing. Ramp up SDA C2 related activity to develop and deploy enterprise capabilities previously deferred by SSC, SpOC, and US Space Command agreement as the program prioritized efforts related to Space Defense Operations Center (SPADOC) decommissioning. Continue development, system engineering and contracting efforts to integrate best in breed commercial, contractor, and government applications through the release of multiple incremental software capability in program increments 24-27 drops throughout FY 2025.</p> <p>Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increase due to expanded effort to replace joint legacy software systems and establish machine-to-machine interfaces for SDA event processing.</p>				
<p>Title: SDA Planning and Tasking Procurement</p> <p>Description: Provides hardware, software, technical documents, integration, testing and associated support to modernize and enhance SDA, Planning, and Tasking infrastructure for operations centers.</p> <p>FY 2024 Plans: SSC will procure Commercial and Government Off The Shelf (COTS/GOTS) hardware and software necessary to host and field critical applications as well as refresh existing hardware in use at Space Force locations. Activities may include but are not limited to sustainment-related program office support, studies, technical analysis, etc.</p> <p>FY 2025 Plans: SSC will procure COTS/GOTS hardware and software necessary to host and field critical applications as well as refresh existing hardware in use at Space Force locations. Implement equipment and licenses to improve system resiliency, cybersecurity, and situational awareness necessary to operate in the contested space domain, conduct studies to identify shared platform, infrastructure, and data layer solutions that will inform future concepts and activities in support of enterprise open frameworks and architectures, as well as risk reduction activities, technical analysis for common platform, infrastructure, and data layers for ground and communication systems to build upon.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increase due to purchase of required hardware, software, and licenses for SDA C2.</p>		0.000	2.436	3.146
<p>Title: SDA Planning and Tasking Sustainment</p>		36.632	34.152	42.142

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
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Appropriation/Budget Activity 3620F: Research, Development, Test & Evaluation, Space Force I BA 8: Software and Digital Technology Pilot Programs	R-1 Program Element (Number/Name) PE 1208248SF I Space Domain Awareness/Planning/Tasking SW
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Description: The program maintains existing capability for the CSpOC, NSDC and other C2 centers. These tasks include maintaining the COTS software database, removing and canceling decommissioned systems and unused tools, adding new tools required for ongoing support of the system, maintaining data support systems, and maintaining day to day software operations which continuously ensures and optimizes reliability, security, resiliency, availability, flexibility and scalability of the warfighter tools.</p> <p>FY 2024 Plans: SSC will continue to fund government software centers, laboratories, and contractors for supporting the update, maintenance and modification, integration, configuration management and cybersecurity requirements of infrastructure and legacy software associated hardware. The program maintains foundational DevSecOps enablers such as, but not limited to, Data as a Service, Platform Support, Continuous Improvement/Continuous Deployment (CI/CD) toolchain, and infrastructure and inherent sustainment efforts that are an integral part of the agile software development process. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc.</p> <p>FY 2025 Plans: Continue to fund government software centers, laboratories, contractors for supporting the update, maintenance and modification, integration, configuration management and cybersecurity requirements of infrastructure, legacy software, associated hardware, operationally accepted software applications, capabilities, and workflows associated with SDA Planning and Tasking program. Expand fielding of Platform, Infrastructure, and Data as a Service to operations sites. This includes associated connectivity, enhancements, on-site manpower, and training required to enable simultaneous operations across all nodes. The program maintains foundational DevSecOps enablers such as, but not limited to, Data as a Service, Platform Support, continuous Improvement/Continuous Deployment (CI/CD) toolchain, and infrastructure and inherent sustainment efforts that are an integral part of the agile software development process.</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increase due to additional sustainment requirements for DevSecOps infrastructure, tools and product support of developed, delivered and operational capabilities.</p>			
Accomplishments/Planned Programs Subtotals	187.160	122.326	157.265

	FY 2023	FY 2024
Congressional Add: Cyber Halo Innovation Research Program (CHIRP) Development	4.820	0.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 8: Software and Digital Technology Pilot Programs</i>	R-1 Program Element (Number/Name) PE 1208248SF / <i>Space Domain Awareness/Planning/Tasking SW</i>
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	FY 2023	FY 2024
FY 2023 Accomplishments: Funds will be used for continued collaboration between SSC, universities/colleges, and industry with a mission to drive innovation and to create a pipeline of talent in cyber security to fill positions at SSC that includes but is not limited to: network security, cyber analysis, incident response, cyber policy, data architecture, continuity of operations, data analytics, machine learning, artificial intelligence, and secure software.		
FY 2024 Plans: N/A		
Congressional Adds Subtotals	4.820	0.000

D. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

E. Acquisition Strategy

The Space Force is employing agile software development practices such as flexible requirements, frequent user interaction, and rapid delivery and deficiency retirement. The program acquires tools and capabilities through an agile-based Rapid Delivery Framework that delivers and sustains new features and capabilities through a CI/CD pipeline with 90-day Program Increments. This strategy focuses on rapidly delivering capability to warfighters and leveraging commercial, industry and government partners. Currently there are multiple contractors performing on competitively-awarded and sole-source contracts with no single prime contractor responsible for the entire ecosystem.

SDA Planning and Tasking program entered the planning phase of the Software Acquisition Pathway in May 2021 in accordance with DoD Instruction 5000.87 and is continuing to execute as an OSD DEVSECOPS pathfinder program.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3620F / 8	R-1 Program Element (Number/Name) PE 1208248SF / <i>Space Domain Awareness /Planning/Tasking SW</i>	Project (Number/Name) 68A035 / <i>SSA/BMC2</i>
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
SDA Planning and Tasking Applications Development	Various	Various : Various	-	107.919	Nov 2022	64.405	Nov 2023	61.065	Nov 2024	-		61.065	Continuing	Continuing	-
SDA Planning and Tasking Platform Development	Various	Various : Various	-	25.655	Nov 2022	-		26.609	Nov 2024	-		26.609	Continuing	Continuing	-
SDA Planning and Tasking Platform Sustainment	Various	Various : Various	-	15.723	Dec 2022	10.502	Dec 2023	18.342	Dec 2024	-		18.342	Continuing	Continuing	-
SDA Planning and Tasking Infrastructure Sustainment	Various	Various : Various	-	1.328	Nov 2022	3.600	Nov 2023	3.600	Nov 2024	-		3.600	Continuing	Continuing	-
SDA Planning and Tasking Enterprise Systems Engineering & Integration	Various	Various : Various	-	1.315	Nov 2022	3.595	Nov 2023	3.000	Nov 2024	-		3.000	Continuing	Continuing	-
SDA Planning and Tasking Data as a Service Sustainment	Various	Various : Various	-	19.581	Nov 2022	20.050	Nov 2023	20.200	Nov 2024	-		20.200	Continuing	Continuing	-
SDA Planning and Tasking Procurement	TBD	TBD : TBD	-	0.000	Mar 2023	2.436	Mar 2024	3.146	Mar 2025	-		3.146	Continuing	Continuing	-
SDA Planning and Tasking Technical Mission Analysis	RO	Aerospace : El Segundo, CA	-	1.892	Jan 2023	2.000	Jan 2024	1.000	Jan 2025	-		1.000	Continuing	Continuing	-
CHIRP	RO	PNNL : Richland, WA	-	4.820	Apr 2023	-		-		-		-	0.000	4.820	5.000
SBIR/STTR	Allot	TBD : TBD	-	0.000	Oct 2022	4.263	Oct 2023	5.662	Oct 2024	-		5.662	Continuing	Continuing	-
Subtotal			-	178.233		110.851		142.624		-		142.624	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
SDA Planning and Tasking Test	Various	Various : Various	-	1.000	Dec 2022	1.600	Dec 2023	2.506	Dec 2024	-		2.506	Continuing	Continuing	-
Subtotal			-	1.000		1.600		2.506		-		2.506	Continuing	Continuing	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 8	R-1 Program Element (Number/Name) PE 1208248SF / <i>Space Domain Awareness /Planning/Tasking SW</i>	Project (Number/Name) 68A035 / <i>SSA/BMC2</i>

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

SDA Planning and Tasking	
Platform/Infrastructure Sustainment	
Platform Development	
Program Increment 16-19	
Program Increment 20-23	
Program Increment 24-27	
Program Increment 28-31	
Program Increment 32-35	
Program Increment 36-39	
Program Increment 40-43	
SDA Planning and Tasking Sustainment (maintain existing capability)	
SDA Planning and Tasking Data as a Service (DaaS)	
CHIRP	
Collaboration with PNNL	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 8	R-1 Program Element (Number/Name) PE 1208248SF / <i>Space Domain Awareness /Planning/Tasking SW</i>	Project (Number/Name) 68A035 / <i>SSA/BMC2</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
SDA Planning and Tasking				
Platform/Infrastructure Sustainment	1	2023	4	2029
Platform Development	1	2025	4	2029
Program Increment 16-19	1	2023	4	2023
Program Increment 20-23	1	2024	4	2024
Program Increment 24-27	1	2025	4	2025
Program Increment 28-31	1	2026	4	2026
Program Increment 32-35	1	2027	4	2027
Program Increment 36-39	1	2028	4	2028
Program Increment 40-43	1	2029	4	2029
SDA Planning and Tasking Sustainment (maintain existing capability)	1	2023	4	2029
SDA Planning and Tasking Data as a Service (DaaS)	1	2023	4	2029
CHIRP				
Collaboration with PNNL	3	2023	4	2023