Department of Defense
Fiscal Year (FY) 2023 Budget Estimates

April 2022

Air Force

Justification Book Volume 2 of 4

Research, Development, Test & Evaluation, Air Force

Vol−2

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Volume 2 Table of Contents

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Fiscal Year (FY) 2023 Budget Estimates
RDT&E Descriptive Summaries
Budget Activities
April 2022

INTRODUCTION AND EXPLANATION OF CONTENTS

GENERAL

- This document has been prepared to provide information on the United States Air Force (USAF) Research, Development, Test and Evaluation (RDT&E) program elements and projects in the FY 2023 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 USAF FY 2022 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 RDTE& 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.

CLASSIFICATION

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

Exhibit footnotes for FY 2020 actuals and FY 2021 Enacted:

a. **Fiscal Year (FY) 2023 Overseas Operations Costs funding accounted for in the Base budget include:**

- Operation INHERENT RESOLVE (OIR) $0 thousands.
- European Deterrence Initiative (EDI) $0 thousands.
- Other theater requirements and related missions $1,065 thousands.

Department of Defense
FY 2023 President's Budget
Exhibit R-1 FY 2023 President's Budget
Total Obligational Authority
(Dollars in Thousands)

25 Mar 2022

Summary Recap of Budget Activities	FY 2021 (Base + OCO)	FY 2022 Less Supplementals Enactment	FY 2022 Division B Division C P.L.117-43 Enactment*	FY 2022 Division B P.L.117-70 Enactment**	FY 2022 Division A P.L. 117-86 Enactment***	FY 2022 Division N P.L. 117-103 Enactment****
Basic Research	496,255	540,706				
Applied Research	1,794,038	1,872,076				
Advanced Technology Development	929,477	1,207,122				
Advanced Component Development & Prototypes	8,528,913	11,293,813				47,500
System Development & Demonstration	5,904,910	5,692,659				
Management Support	4,072,703	3,508,829				
Operational Systems Development	24,647,644	28,920,584				
Software and Digital Technology Pilot Programs	155,067	154,529				
Total Research, Development, Test & Evaluation	46,529,007	53,190,318				47,500

R-123PBP: FY 2023 President's Budget (Total Base Published Version), as of March 25, 2022 at 15:49:52
*Includes enacted funding pursuant to the Extending Government Funding and Delivering Emergency Assistance Act (Public Law 117-43).
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Summary Recap of Budget Activities	FY 2022 Total Supplemental Enactment	FY 2022 Total Enactment	FY 2023 Request
Basic Research		540,706	546,517
Applied Research		1,872,076	1,549,524
Advanced Technology Development		1,207,122	1,391,486
Advanced Component Development & Prototypes	47,500	11,341,313	10,937,696
System Development & Demonstration		5,692,659	11,774,613
Management Support		3,508,829	3,458,471
Operational Systems Development		28,920,584	29,193,876
Software and Digital Technology Pilot Programs		154,529	1,101,490
Total Research, Development, Test & Evaluation	47,500	53,237,818	59,953,673

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Summary Recap of FYDP Programs						
Strategic Forces	897,413	1,157,141				
General Purpose Forces	3,542,013	4,578,366				
Intelligence and Communications	1,143,506	1,142,450				47,500
Mobility Forces	886,208	825,887				
Research and Development	14,431,656	16,605,652				
Central Supply and Maintenance	122,916	155,648				
Training Medical and Other	7,012	17,944				
Administration and Associated Activities	68,180	89,612				
Support of Other Nations	3,592	2,420				
Space	6,979,949	7,040,836				
Classified Programs	18,446,562	21,574,362				
Total Research, Development, Test & Evaluation	46,529,007	53,190,318				47,500

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25 Mar 2022

	FY 2022 Total Supplemental Enactment	FY 2022 Total Enactment	FY 2023 Request
Summary Recap of FYDP Programs			
Strategic Forces		1,157,141	1,217,682
General Purpose Forces		4,578,366	4,818,319
Intelligence and Communications	47,500	1,189,950	1,509,185
Mobility Forces		825,887	765,678
Research and Development		16,605,652	18,433,261
Central Supply and Maintenance		155,648	66,133
Training Medical and Other		17,944	27,538
Administration and Associated Activities		89,612	29,823
Support of Other Nations		2,420	2,593
Space		7,040,836	10,869,462
Classified Programs		21,574,362	22,213,999
Total Research, Development, Test & Evaluation	47,500	53,237,818	59,953,673

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Basic Research	496,255	540,706				
Applied Research	1,579,544	1,585,571				
Advanced Technology Development	929,477	968,538				
Advanced Component Development & Prototypes	7,193,095	9,695,253				47,500
System Development & Demonstration	2,266,274	2,524,849				
Management Support	3,534,738	3,037,687				
Operational Systems Development	20,022,756	23,240,309				
Software and Digital Technology Pilot Programs						
Total Research, Development, Test & Evaluation	36,022,139	41,592,913				47,500

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Summary Recap of Budget Activities	FY 2022 Total Supplemental Enactment	FY 2022 Total Enactment	FY 2023 Request
Basic Research		540,706	546,517
Applied Research		1,585,571	1,305,787
Advanced Technology Development		968,538	827,271
Advanced Component Development & Prototypes	47,500	9,742,753	7,945,238
System Development & Demonstration		2,524,849	6,438,954
Management Support		3,037,687	3,033,528
Operational Systems Development		23,240,309	23,090,569
Software and Digital Technology Pilot Programs			946,437
Total Research, Development, Test & Evaluation	47,500	41,640,413	44,134,301

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General Purpose Forces	3,542,013	4,578,366				
Intelligence and Communications	1,143,506	1,142,450				47,500
Mobility Forces	886,208	825,887				
Research and Development	14,431,656	16,605,652				
Central Supply and Maintenance	122,916	155,648				
Training Medical and Other	7,012	17,944				
Administration and Associated Activities	68,180	89,612				
Support of Other Nations	3,592	2,420				
Space	9,974	6,740				
Classified Programs	14,909,669	17,011,053				
Total Research, Development, Test & Evaluation	36,022,139	41,592,913				47,500

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General Purpose Forces		4,578,366	4,818,319
Intelligence and Communications	47,500	1,189,950	1,509,185
Mobility Forces		825,887	765,678
Research and Development		16,605,652	18,432,445
Central Supply and Maintenance		155,648	66,133
Training Medical and Other		17,944	27,538
Administration and Associated Activities		89,612	29,823
Support of Other Nations		2,420	2,593
Space		6,740	24,264
Classified Programs		17,011,053	17,240,641
Total Research, Development, Test & Evaluation	47,500	41,640,413	44,134,301

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Department of the Air Force
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25 Mar 2022

Appropriation: 3600F Research, Development, Test & Eval, AF

Line No	Program Element Number	Item	Act	FY 2021 (Base + OCO)	FY 2022 Less Supplementals Enactment	FY 2022 Division B Division C P.L.117-43 Enactment*	FY 2022 Division B P.L.117-70 Enactment**	FY 2022 Division A P.L. 117-86 Enactment***	FY 2022 Division N P.L. 117-103 Enactment****	Sec
1	0601102F	Defense Research Sciences	01	303,718	353,303					U
2	0601103F	University Research Initiatives	01	178,083	187,403					U
3	0601108F	High Energy Laser Research Initiatives	01	14,454						U
	Basic	Research		496,255	540,706					
4	0602020F	Future AF Capabilities Applied Research	02	73,226	79,901					U
5	0602102F	Materials	02	228,115	220,960					U
6	0602201F	Aerospace Vehicle Technologies	02	148,576	183,032					U
7	0602202F	Human Effectiveness Applied Research	02	127,160	156,863					U
8	0602203F	Aerospace Propulsion	02	190,732	190,683					U
9	0602204F	Aerospace Sensors	02	221,779	255,918					U
10	0602212F	Defense Laboratories R&D Projects (10 U.S.C, Sec 2358)	02	106,964						U
11	0602298F	Science and Technology Management - Major Headquarters Activities	02	8,910	8,891					U
12	0602602F	Conventional Munitions	02	118,541	151,757					U
13	0602605F	Directed Energy Technology	02	122,816	116,456					U
14	0602788F	Dominant Information Sciences and Methods	02	205,839	221,110					U

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Line No	Program Element Number	Item	Act	FY 2022 Total Supplemental Enactment	FY 2022 Total Enactment	FY 2023 Request	Sec
1	0601102F	Defense Research Sciences	01		353,303	375,325	U
2	0601103F	University Research Initiatives	01		187,403	171,192	U
3	0601108F	High Energy Laser Research Initiatives	01				U
	Basic	Research			540,706	546,517	
4	0602020F	Future AF Capabilities Applied Research	02		79,901	88,672	U
5	0602102F	Materials	02		220,960	134,795	U
6	0602201F	Aerospace Vehicle Technologies	02		183,032	159,453	U
7	0602202F	Human Effectiveness Applied Research	02		156,863	135,771	U
8	0602203F	Aerospace Propulsion	02		190,683	172,861	U
9	0602204F	Aerospace Sensors	02		255,918	192,733	U
10	0602212F	Defense Laboratories R&D Projects (10 U.S.C, Sec 2358)	02				U
11	0602298F	Science and Technology Management - Major Headquarters Activities	02		8,891	8,856	U
12	0602602F	Conventional Munitions	02		151,757	137,303	U
13	0602605F	Directed Energy Technology	02		116,456	109,302	U
14	0602788F	Dominant Information Sciences and Methods	02		221,110	166,041	U

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15	0602890F	High Energy Laser Research	02	26,886						U
		Applied Research		1,579,544	1,585,571					
16	0603032F	Future AF Integrated Technology Demos	03	135,940	112,643					U
17	0603112F	Advanced Materials for Weapon Systems	03	57,221	63,378					U
18	0603199F	Sustainment Science and Technology (S&T)	03	15,631	19,112					U
19	0603203F	Advanced Aerospace Sensors	03	33,162	53,750					U
20	0603211F	Aerospace Technology Dev/Demo	03	34,321	105,486					U
21	0603216F	Aerospace Propulsion and Power Technology	03	159,354	110,273					U
22	0603270F	Electronic Combat Technology	03	33,804	44,938					U
23	0603273F	Science & Technology for Nuclear Re-entry Systems	03							U
24	0603401F	Advanced Spacecraft Technology	03	63,088						U
25	0603444F	Maui Space Surveillance System (MSSS)	03	11,486						U
26	0603456F	Human Effectiveness Advanced Technology Development	03	29,412	23,459					U
27	0603601F	Conventional Weapons Technology	03	124,025	155,306					U
28	0603605F	Advanced Weapons Technology	03	29,094	31,855					U

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15	0602890F	High Energy Laser Research	02				U
		Applied Research			1,585,571	1,305,787	
16	0603032F	Future AF Integrated Technology Demos	03		112,643	152,559	U
17	0603112F	Advanced Materials for Weapon Systems	03		63,378	29,116	U
18	0603199F	Sustainment Science and Technology (S&T)	03		19,112	10,695	U
19	0603203F	Advanced Aerospace Sensors	03		53,750	36,997	U
20	0603211F	Aerospace Technology Dev/Demo	03		105,486	54,727	U
21	0603216F	Aerospace Propulsion and Power Technology	03		110,273	64,254	U
22	0603270F	Electronic Combat Technology	03		44,938	33,380	U
23	0603273F	Science & Technology for Nuclear Re-entry Systems	03			39,431	U
24	0603401F	Advanced Spacecraft Technology	03				U
25	0603444F	Maui Space Surveillance System (MSSS)	03				U
26	0603456F	Human Effectiveness Advanced Technology Development	03		23,459	20,652	U
27	0603601F	Conventional Weapons Technology	03		155,306	187,374	U
28	0603605F	Advanced Weapons Technology	03		31,855	98,503	U

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29	0603680F	Manufacturing Technology Program	03	143,334	176,200					U
30	0603788F	Battlespace Knowledge Development and Demonstration	03	59,605	72,138					U
		Advanced Technology Development		929,477	968,538					
31	0603036F	Modular Advanced Missile	04							U
32	0603260F	Intelligence Advanced Development	04	4,312	5,795					U
33	0603742F	Combat Identification Technology	04	25,824	21,939					U
34	0603790F	NATO Research and Development	04	3,506	4,114					U
35	0603851F	Intercontinental Ballistic Missile - Dem/Val	04	34,755	76,621					U
36	0604001F	NC3 Advanced Concepts	04		6,900					U
37	0604002F	Air Force Weather Services Research	04	2,151	3,855					U
38	0604003F	Advanced Battle Management System (ABMS)	04	152,691	268,849					U
39	0604004F	Advanced Engine Development	04	642,581	583,712					U
40	0604006F	Dept of the Air Force Tech Architecture	04		25,138					U
41	0604015F	Long Range Strike - Bomber	04	2,744,473	2,872,624					U
42	0604032F	Directed Energy Prototyping	04	19,023	15,820					U
43	0604033F	Hypersonics Prototyping	04	374,426	318,687					U

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29	0603680F	Manufacturing Technology Program	03		176,200	47,759	U
30	0603788F	Battlespace Knowledge Development and Demonstration	03		72,138	51,824	U
		Advanced Technology Development			968,538	827,271	
31	0603036F	Modular Advanced Missile	04			125,688	U
32	0603260F	Intelligence Advanced Development	04		5,795	6,101	U
33	0603742F	Combat Identification Technology	04		21,939	17,318	U
34	0603790F	NATO Research and Development	04		4,114	4,295	U
35	0603851F	Intercontinental Ballistic Missile - Dem/Val	04		76,621	46,432	U
36	0604001F	NC3 Advanced Concepts	04		6,900	5,098	U
37	0604002F	Air Force Weather Services Research	04		3,855		U
38	0604003F	Advanced Battle Management System (ABMS)	04		268,849	231,408	U
39	0604004F	Advanced Engine Development	04		583,712	353,658	U
40	0604006F	Dept of the Air Force Tech Architecture	04		25,138	66,615	U
41	0604015F	Long Range Strike - Bomber	04		2,872,624	3,253,584	U
42	0604032F	Directed Energy Prototyping	04		15,820	4,269	U
43	0604033F	Hypersonics Prototyping	04		318,687	431,868	U

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44	0604183F	Hypersonics Prototyping - Hypersonic Attack Cruise Missile (HACM)	04		190,116					U
45	0604201F	PNT Resiliency, Mods, and Improvements	04		39,742					U
46	0604257F	Advanced Technology and Sensors	04	25,901	23,745					U
47	0604288F	Survivable Airborne Operations Center	04	50,038	95,788					U
48	0604317F	Technology Transfer	04	16,823	56,768					U
49	0604327F	Hard and Deeply Buried Target Defeat System (HDBTDS) Program	04	53,026	12,886					U
50	0604414F	Cyber Resiliency of Weapon Systems-ACS	04	67,616	71,229					U
51	0604668F	Joint Transportation Management System (JTMS)	04							U
52	0604776F	Deployment & Distribution Enterprise R&D	04	25,474	40,103					U
53	0604858F	Tech Transition Program	04	297,254	359,045					U
54	0604860F	Operational Energy and Installation Resilience	04		104,000					U
55	0605230F	Ground Based Strategic Deterrent	04	1,397,485	2,553,541					U
56	0207110F	Next Generation Air Dominance	04	869,740	1,524,667					U
57	0207179F	Autonomous Collaborative Platforms	04							U

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Department of the Air Force
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Total Obligational Authority
(Dollars in Thousands)

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Appropriation: 3600F Research, Development, Test & Eval, AF

Line No	Program Element Number	Item	Act	FY 2022 Total Supplemental Enactment	FY 2022 Total Enactment	FY 2023 Request	Sec
44	0604183F	Hypersonics Prototyping - Hypersonic Attack Cruise Missile (HACM)	04		190,116	144,891	U
45	0604201F	PNT Resiliency, Mods, and Improvements	04		39,742	12,010	U
46	0604257F	Advanced Technology and Sensors	04		23,745	13,311	U
47	0604288F	Survivable Airborne Operations Center	04		95,788	203,213	U
48	0604317F	Technology Transfer	04		56,768	16,759	U
49	0604327F	Hard and Deeply Buried Target Defeat System (HDBTDS) Program	04		12,886	106,826	U
50	0604414F	Cyber Resiliency of Weapon Systems-ACS	04		71,229	44,526	U
51	0604668F	Joint Transportation Management System (JTMS)	04			51,758	U
52	0604776F	Deployment & Distribution Enterprise R&D	04		40,103	27,586	U
53	0604858F	Tech Transition Program	04		359,045	649,545	U
54	0604860F	Operational Energy and Installation Resilience	04		104,000		U
55	0605230F	Ground Based Strategic Deterrent	04		2,553,541		U
56	0207110F	Next Generation Air Dominance	04		1,524,667	1,657,733	U
57	0207179F	Autonomous Collaborative Platforms	04			51,747	U

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Line No	Program Element Number	Item	Act	FY 2021 (Base + OCO)	FY 2022 Less Supplementals Enactment	FY 2022 Division B Division C P.L.117-43 Enactment*	FY 2022 Division B P.L.117-70 Enactment**	FY 2022 Division A P.L. 117-86 Enactment***	FY 2022 Division N P.L. 117-103 Enactment****	Sec
58	0207420F	Combat Identification	04							U
59	0207455F	Three Dimensional Long-Range Radar (3DELRR)	04	18,862						U
60	0207522F	Airbase Air Defense Systems (ABADS)	04	8,451	10,905					U
61	0208030F	War Reserve Materiel - Ammunition	04		3,943					U
62	0208099F	Unified Platform (UP)	04	5,869						U
63	0304369F	Cyber Capabilities Support Office (CCSO)	04	19,964						U
64	0305236F	Common Data Link Executive Agent (CDL EA)	04	39,221	43,881					U
65	0305601F	Mission Partner Environments	04	10,991	16,420					U
66	0306250F	Cyber Operations Technology Support	04	226,073	242,499				38,900	U
67	0306415F	Enabled Cyber Activities	04	10,166	16,578				8,600	U
68	0401310F	C-32 Executive Transport Recapitalization	04	6,151						U
69	0708051F	Rapid Sustainment Modernization (RSM)	04	34,693	65,000					U
70	0808737F	CVV Integrated Prevention	04							U
71	0901410F	Contracting Information Technology System	04	5,555	20,343					U

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58	0207420F	Combat Identification	04			1,866	U
59	0207455F	Three Dimensional Long-Range Radar (3DELRR)	04			14,490	U
60	0207522F	Airbase Air Defense Systems (ABADS)	04		10,905	52,498	U
61	0208030F	War Reserve Materiel - Ammunition	04		3,943	10,288	U
62	0208099F	Unified Platform (UP)	04				U
63	0304369F	Cyber Capabilities Support Office (CCSO)	04				U
64	0305236F	Common Data Link Executive Agent (CDL EA)	04		43,881	37,460	U
65	0305601F	Mission Partner Environments	04		16,420	17,378	U
66	0306250F	Cyber Operations Technology Support	04	38,900	281,399	234,576	U
67	0306415F	Enabled Cyber Activities	04	8,600	25,178	16,728	U
68	0401310F	C-32 Executive Transport Recapitalization	04				U
69	0708051F	Rapid Sustainment Modernization (RSM)	04		65,000		U
70	0808737F	CVV Integrated Prevention	04			9,315	U
71	0901410F	Contracting Information Technology System	04		20,343	14,050	U

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72	1206415F	U.S. Space Command Research and Development Support	04							U
		Advanced Component Development & Prototypes		7,193,095	9,695,253				47,500	
73	0604200F	Future Advanced Weapon Analysis & Programs	05	22,478	18,499					U
74	0604201F	PNT Resiliency, Mods, and Improvements	05	37,409	163,520					U
75	0604222F	Nuclear Weapons Support	05	24,502	30,050					U
76	0604270F	Electronic Warfare Development	05	2,017	7,110					U
77	0604281F	Tactical Data Networks Enterprise	05	111,125	159,836					U
78	0604287F	Physical Security Equipment	05	5,979	8,469					U
79	0604602F	Armament/Ordnance Development	05	20,199	9,047					U
80	0604604F	Submunitions	05	3,085	2,954					U
81	0604617F	Agile Combat Support	05	18,398	27,938					U
82	0604618F	Joint Direct Attack Munition	05	6,555						U
83	0604706F	Life Support Systems	05	27,748	25,437					U
84	0604735F	Combat Training Ranges	05	23,054	23,980					U
85	0604800F	F-35 - EMD	05	5,214						U
86	0604932F	Long Range Standoff Weapon	05	373,499	599,042					U
87	0604933F	ICBM Fuze Modernization	05	151,158	129,709					U

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72	1206415F	U.S. Space Command Research and Development Support	04			10,350	U
		Advanced Component Development & Prototypes		47,500	9,742,753	7,945,238	
73	0604200F	Future Advanced Weapon Analysis & Programs	05		18,499	9,879	U
74	0604201F	PNT Resiliency, Mods, and Improvements	05		163,520	176,824	U
75	0604222F	Nuclear Weapons Support	05		30,050	64,425	U
76	0604270F	Electronic Warfare Development	05		7,110	2,222	U
77	0604281F	Tactical Data Networks Enterprise	05		159,836	133,117	U
78	0604287F	Physical Security Equipment	05		8,469	8,493	U
79	0604602F	Armament/Ordnance Development	05		9,047	5,279	U
80	0604604F	Submunitions	05		2,954	3,273	U
81	0604617F	Agile Combat Support	05		27,938	14,252	U
82	0604618F	Joint Direct Attack Munition	05				U
83	0604706F	Life Support Systems	05		25,437	47,442	U
84	0604735F	Combat Training Ranges	05		23,980	91,284	U
85	0604800F	F-35 - EMD	05				U
86	0604932F	Long Range Standoff Weapon	05		599,042	928,850	U
87	0604933F	ICBM Fuze Modernization	05		129,709	98,376	U

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88	0605030F	Joint Tactical Network Center (JTNC)	05							U
89	0605056F	Open Architecture Management	05	29,709	37,109					U
90	0605223F	Advanced Pilot Training	05	216,765	188,898					U
91	0605229F	HH-60W	05	32,196	62,255					U
92	0605238F	Ground Based Strategic Deterrent EMD	05							U
93	0101125F	Nuclear Weapons Modernization	05	9,595						U
94	0207171F	F-15 EPAWSS	05	165,691	112,012					U
95	0207279F	Isolated Personnel Survivability and Recovery	05							U
96	0207328F	Stand In Attack Weapon	05	145,858	166,570					U
97	0207701F	Full Combat Mission Training	05	9,060	12,064					U
98	0303267F	Auctioned Spectrum Relocation Fund	05	36,154						U
99	0303667F	Citizen Broadband Radio System	05	2,306						U
100	0303767F	AMBIT - Pre-Auctioned SRF	05	5,270						U
101	0305176F	Combat Survivor Evader Locator	05	935						U
102	0401221F	KC-46A Tanker Squadrons	05	35,818	66,758					U
103	0401319F	VC-25B	05	720,155	655,665					U
104	0701212F	Automated Test Systems	05	12,418	15,445					U

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88	0605030F	Joint Tactical Network Center (JTNC)	05			2,222	U
89	0605056F	Open Architecture Management	05		37,109	38,222	U
90	0605223F	Advanced Pilot Training	05		188,898	37,121	U
91	0605229F	HH-60W	05		62,255	58,974	U
92	0605238F	Ground Based Strategic Deterrent EMD	05			3,614,290	U
93	0101125F	Nuclear Weapons Modernization	05				U
94	0207171F	F-15 EPAWSS	05		112,012	67,956	U
95	0207279F	Isolated Personnel Survivability and Recovery	05			27,881	U
96	0207328F	Stand In Attack Weapon	05		166,570	283,152	U
97	0207701F	Full Combat Mission Training	05		12,064	3,028	U
98	0303267F	Auctioned Spectrum Relocation Fund	05				U
99	0303667F	Citizen Broadband Radio System	05				U
100	0303767F	AMBIT - Pre-Auctioned SRF	05				U
101	0305176F	Combat Survivor Evader Locator	05				U
102	0401221F	KC-46A Tanker Squadrons	05		66,758	197,510	U
103	0401319F	VC-25B	05		655,665	492,932	U
104	0701212F	Automated Test Systems	05		15,445	16,664	U

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105	0804772F	Training Developments	05	4,471	2,482					U
106	0901299F	AF A1 Systems	05	7,453						U
107	1206442F	Next Generation OPIR	05							U
		System Development & Demonstration		2,266,274	2,524,849					
108	0604256F	Threat Simulator Development	06	56,987	46,909					U
109	0604759F	Major T&E Investment	06	207,103	130,766					U
110	0605101F	RAND Project Air Force	06	35,195	36,017					U
111	0605502F	Small Business Innovation Research	06	662,308						U
112	0605712F	Initial Operational Test & Evaluation	06	10,407	12,582					U
113	0605807F	Test and Evaluation Support	06	770,149	811,032					U
114	0605826F	Acq Workforce- Global Power	06	264,371						U
115	0605827F	Acq Workforce- Global Vig & Combat Sys	06	263,868	267,919					U
116	0605828F	Acq Workforce- Global Reach	06	164,440	429,659					U
117	0605829F	Acq Workforce- Cyber, Network, & Bus Sys	06	251,517	439,571					U
118	0605830F	Acq Workforce- Global Battle Mgmt	06	173,987						U
119	0605831F	Acq Workforce- Capability Integration	06	227,357	263,014					U

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105	0804772F	Training Developments	05		2,482	15,138	U
106	0901299F	AF A1 Systems	05				U
107	1206442F	Next Generation OPIR	05			148	U
		System Development & Demonstration			2,524,849	6,438,954	
108	0604256F	Threat Simulator Development	06		46,909	21,067	U
109	0604759F	Major T&E Investment	06		130,766	44,714	U
110	0605101F	RAND Project Air Force	06		36,017	37,921	U
111	0605502F	Small Business Innovation Research	06			86	U
112	0605712F	Initial Operational Test & Evaluation	06		12,582	13,926	U
113	0605807F	Test and Evaluation Support	06		811,032	826,854	U
114	0605826F	Acq Workforce- Global Power	06				U
115	0605827F	Acq Workforce- Global Vig & Combat Sys	06		267,919	255,995	U
116	0605828F	Acq Workforce- Global Reach	06		429,659	457,589	U
117	0605829F	Acq Workforce- Cyber, Network, & Bus Sys	06		439,571	459,223	U
118	0605830F	Acq Workforce- Global Battle Mgmt	06			3,696	U
119	0605831F	Acq Workforce- Capability Integration	06		263,014	229,610	U

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120	0605832F	Acq Workforce- Advanced Prgm Technology	06	53,577	62,755					U
121	0605833F	Acq Workforce- Nuclear Systems	06	174,318	227,425					U
122	0605898F	Management HQ - R&D	06	5,424	5,537					U
123	0605976F	Facilities Restoration and Modernization - Test and Evaluation Support	06	60,856	70,788					U
124	0605978F	Facilities Sustainment - Test and Evaluation Support	06	29,826	30,057					U
125	0606017F	Requirements Analysis and Maturation	06	66,233	90,799					U
126	0606398F	Management HQ - T&E	06	6,929	6,163					U
127	0303166F	Support to Information Operations (IO) Capabilities	06		537					U
128	0303255F	Command, Control, Communication, and Computers (C4) - STRATCOM	06	21,525	35,340					U
129	0308602F	ENTEPRISE INFORMATION SERVICES (EIS)	06	9,561	26,720					U
130	0702806F	Acquisition and Management Support	06	12,943	37,211					U
131	0804731F	General Skill Training	06	1,260	1,506					U
132	0804772F	Training Developments	06		2,957					U
133	0909999F	Financing for Cancelled Account Adjustments	06	1,005						U

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120	0605832F	Acq Workforce- Advanced Prgm Technology	06		62,755	92,648	U
121	0605833F	Acq Workforce- Nuclear Systems	06		227,425	241,226	U
122	0605898F	Management HQ - R&D	06		5,537	4,347	U
123	0605976F	Facilities Restoration and Modernization - Test and Evaluation Support	06		70,788	77,820	U
124	0605978F	Facilities Sustainment - Test and Evaluation Support	06		30,057	31,561	U
125	0606017F	Requirements Analysis and Maturation	06		90,799	101,844	U
126	0606398F	Management HQ - T&E	06		6,163	6,285	U
127	0303166F	Support to Information Operations (IO) Capabilities	06		537	556	U
128	0303255F	Command, Control, Communication, and Computers (C4) - STRATCOM	06		35,340	15,559	U
129	0308602F	ENTEPRISE INFORMATION SERVICES (EIS)	06		26,720	83,231	U
130	0702806F	Acquisition and Management Support	06		37,211	24,306	U
131	0804731F	General Skill Training	06		1,506	871	U
132	0804772F	Training Developments	06		2,957		U
133	0909999F	Financing for Cancelled Account Adjustments	06				U

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134	1001004F	International Activities	06	3,592	2,420					U
135	1206864F	Space Test Program (STP)	06		3					U
		Management Support		3,534,738	3,037,687					
136	0604233F	Specialized Undergraduate Flight Training	07	13,438	8,589					U
137	0604445F	Wide Area Surveillance	07		2,760					U
138	0604617F	Agile Combat Support	07							U
139	0604776F	Deployment & Distribution Enterprise R&D	07	479						U
140	0604840F	F-35 C2D2	07	684,931	1,105,404					U
141	0605018F	AF Integrated Personnel and Pay System (AF-IPPS)	07	29,526	22,010					U
142	0605024F	Anti-Tamper Technology Executive Agency	07	46,785	51,492					U
143	0605117F	Foreign Materiel Acquisition and Exploitation	07	68,962	71,391					U
144	0605278F	HC/MC-130 Recap RDT&E	07	15,552	46,796					U
145	0606018F	NC3 Integration	07	30,521	26,532					U
146	0606942F	Assessments and Evaluations Cyber Vulnerabilities	07	2,885						U
147	0101113F	B-52 Squadrons	07	453,605	646,811					U

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134	1001004F	International Activities	06		2,420	2,593	U
135	1206864F	Space Test Program (STP)	06		3		U
		Management Support			3,037,687	3,033,528	
136	0604233F	Specialized Undergraduate Flight Training	07		8,589	18,037	U
137	0604445F	Wide Area Surveillance	07		2,760		U
138	0604617F	Agile Combat Support	07			8,199	U
139	0604776F	Deployment & Distribution Enterprise R&D	07			156	U
140	0604840F	F-35 C2D2	07		1,105,404	1,014,708	U
141	0605018F	AF Integrated Personnel and Pay System (AF-IPPS)	07		22,010	37,901	U
142	0605024F	Anti-Tamper Technology Executive Agency	07		51,492	50,066	U
143	0605117F	Foreign Materiel Acquisition and Exploitation	07		71,391	80,338	U
144	0605278F	HC/MC-130 Recap RDT&E	07		46,796	47,994	U
145	0606018F	NC3 Integration	07		26,532	23,559	U
146	0606942F	Assessments and Evaluations Cyber Vulnerabilities	07				U
147	0101113F	B-52 Squadrons	07		646,811	770,313	U

R-123PBP: FY 2023 President's Budget (Total Base Published Version), as of March 25, 2022 at 15:49:52

Department of the Air Force
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25 Mar 2022

Appropriation: 3600F Research, Development, Test & Eval, AF

Line No	Program Element Number	Item	Act	FY 2021 (Base + OCO)	FY 2022 Less Supplementals Enactment	FY 2022 Division B Division C P.L.117-43 Enactment*	FY 2022 Division B P.L.117-70 Enactment**	FY 2022 Division A P.L. 117-86 Enactment***	FY 2022 Division N P.L. 117-103 Enactment****	Sec
148	0101122F	Air-Launched Cruise Missile (ALCM)	07	1,377	453					U
149	0101126F	B-1B Squadrons	07	15,276	39,127					U
150	0101127F	B-2 Squadrons	07	147,390	131,647					U
151	0101213F	Minuteman Squadrons	07	63,535	113,622					U
152	0101316F	Worldwide Joint Strategic Communications	07	30,124	15,202					U
153	0101324F	Integrated Strategic Planning & Analysis Network	07	23,420	29,564					U
154	0101328F	ICBM Reentry Vehicles	07	108,625	96,313					U
156	0102110F	UH-1N Replacement Program	07	34,524	16,132					U
157	0102326F	Region/Sector Operation Control Center Modernization Program	07	9,846	771					U
158	0102412F	North Warning System (NWS)	07	96	99					U
159	0102417F	Over-the-Horizon Backscatter Radar	07		67,400					U
160	0202834F	Vehicles and Support Equipment - General	07		5,889					U
161	0205219F	MQ-9 UAV	07	103,245	79,121					U
162	0205671F	Joint Counter RCIED Electronic Warfare	07	4,080	3,111					U
163	0207040F	Multi-Platform Electronic Warfare Equipment	07		36,607					U

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Department of the Air Force
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(Dollars in Thousands)

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Appropriation: 3600F Research, Development, Test & Eval, AF

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148	0101122F	Air-Launched Cruise Missile (ALCM)	07		453	571	U
149	0101126F	B-1B Squadrons	07		39,127	13,144	U
150	0101127F	B-2 Squadrons	07		131,647	111,990	U
151	0101213F	Minuteman Squadrons	07		113,622	69,650	U
152	0101316F	Worldwide Joint Strategic Communications	07		15,202	22,725	U
153	0101324F	Integrated Strategic Planning & Analysis Network	07		29,564	3,180	U
154	0101328F	ICBM Reentry Vehicles	07		96,313	118,616	U
156	0102110F	UH-1N Replacement Program	07		16,132	17,922	U
157	0102326F	Region/Sector Operation Control Center Modernization Program	07		771	451	U
158	0102412F	North Warning System (NWS)	07		99	76,910	U
159	0102417F	Over-the-Horizon Backscatter Radar	07		67,400	12,210	U
160	0202834F	Vehicles and Support Equipment - General	07		5,889	14,483	U
161	0205219F	MQ-9 UAV	07		79,121	98,499	U
162	0205671F	Joint Counter RCIED Electronic Warfare	07		3,111	1,747	U
163	0207040F	Multi-Platform Electronic Warfare Equipment	07		36,607	23,195	U

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Appropriation: 3600F Research, Development, Test & Eval, AF

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164	0207131F	A-10 Squadrons	07	24,274	34,224					U
165	0207133F	F-16 Squadrons	07	197,641	225,573					U
166	0207134F	F-15E Squadrons	07	230,299	239,616					U
167	0207136F	Manned Destructive Suppression	07	14,462	15,855					U
168	0207138F	F-22A Squadrons	07	642,138	647,296					U
169	0207142F	F-35 Squadrons	07	104,264	69,365					U
170	0207146F	F-15EX	07	79,866	107,126					U
171	0207161F	Tactical AIM Missiles	07	18,779	32,974					U
172	0207163F	Advanced Medium Range Air-to-Air Missile (AMRAAM)	07	50,074	51,288					U
173	0207227F	Combat Rescue - Pararescue	07	668	852					U
174	0207247F	AF TENCAP	07	21,605	23,685					U
175	0207249F	Precision Attack Systems Procurement	07	8,983	12,083					U
176	0207253F	Compass Call	07	15,228	91,266					U
177	0207268F	Aircraft Engine Component Improvement Program	07	121,206	115,715					U
178	0207325F	Joint Air-to-Surface Standoff Missile (JASSM)	07	63,712	117,325					U
179	0207327F	Small Diameter Bomb (SDB)	07	20,010	32,109					U

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Appropriation: 3600F Research, Development, Test & Eval, AF

Line No	Program Element Number	Item	Act	FY 2022 Total Supplemental Enactment	FY 2022 Total Enactment	FY 2023 Request	Sec
164	0207131F	A-10 Squadrons	07		34,224	72,393	U
165	0207133F	F-16 Squadrons	07		225,573	244,696	U
166	0207134F	F-15E Squadrons	07		239,616	213,272	U
167	0207136F	Manned Destructive Suppression	07		15,855	16,695	U
168	0207138F	F-22A Squadrons	07		647,296	559,709	U
169	0207142F	F-35 Squadrons	07		69,365	70,730	U
170	0207146F	F-15EX	07		107,126	83,830	U
171	0207161F	Tactical AIM Missiles	07		32,974	34,536	U
172	0207163F	Advanced Medium Range Air-to-Air Missile (AMRAAM)	07		51,288	52,704	U
173	0207227F	Combat Rescue - Pararescue	07		852	863	U
174	0207247F	AF TENCAP	07		23,685	23,309	U
175	0207249F	Precision Attack Systems Procurement	07		12,083	12,722	U
176	0207253F	Compass Call	07		91,266	49,054	U
177	0207268F	Aircraft Engine Component Improvement Program	07		115,715	116,087	U
178	0207325F	Joint Air-to-Surface Standoff Missile (JASSM)	07		117,325	117,198	U
179	0207327F	Small Diameter Bomb (SDB)	07		32,109	27,713	U

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Appropriation: 3600F Research, Development, Test & Eval, AF

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180	0207410F	Air & Space Operations Center (AOC)	07	50,133	90,027					U
181	0207412F	Control and Reporting Center (CRC)	07	15,514	9,875					U
182	0207417F	Airborne Warning and Control System (AWACS)	07	108,779	167,014					U
183	0207418F	AFSPECWAR - TACP	07	497	4,598					U
185	0207431F	Combat Air Intelligence System Activities	07	16,534	17,863					U
186	0207438F	Theater Battle Management (TBM) C4I	07	7,660	7,905					U
187	0207439F	Electronic Warfare Integrated Reprogramming (EWIR)	07		15,000					U
188	0207444F	Tactical Air Control Party-Mod	07	12,589	13,081					U
189	0207452F	DCAPES	07	14,135	4,305					U
190	0207521F	Air Force Calibration Programs	07	1,966	1,984					U
191	0207522F	Airbase Air Defense Systems (ABADS)	07		7,392					U
192	0207573F	National Technical Nuclear Forensics	07	380	1,971					U
193	0207590F	Seek Eagle	07	29,572	30,539					U
194	0207601F	USAF Modeling and Simulation	07	17,023	17,110					U
195	0207605F	Wargaming and Simulation Centers	07	6,113	7,535					U

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Line No	Program Element Number	Item	Act	FY 2022 Total Supplemental Enactment	FY 2022 Total Enactment	FY 2023 Request	Sec
180	0207410F	Air & Space Operations Center (AOC)	07		90,027		U
181	0207412F	Control and Reporting Center (CRC)	07		9,875	6,615	U
182	0207417F	Airborne Warning and Control System (AWACS)	07		167,014	239,658	U
183	0207418F	AFSPECWAR - TACP	07		4,598	5,982	U
185	0207431F	Combat Air Intelligence System Activities	07		17,863	23,504	U
186	0207438F	Theater Battle Management (TBM) C4I	07		7,905	5,851	U
187	0207439F	Electronic Warfare Integrated Reprogramming (EWIR)	07		15,000	15,990	U
188	0207444F	Tactical Air Control Party-Mod	07		13,081	10,315	U
189	0207452F	DCAPES	07		4,305	8,049	U
190	0207521F	Air Force Calibration Programs	07		1,984	2,123	U
191	0207522F	Airbase Air Defense Systems (ABADS)	07		7,392		U
192	0207573F	National Technical Nuclear Forensics	07		1,971	2,039	U
193	0207590F	Seek Eagle	07		30,539	32,853	U
194	0207601F	USAF Modeling and Simulation	07		17,110	19,341	U
195	0207605F	Wargaming and Simulation Centers	07		7,535	7,004	U

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196	0207610F	Battlefield Abn Comm Node (BACN)	07	5,450	32,008					U
197	0207697F	Distributed Training and Exercises	07	3,260	4,007					U
198	0208006F	Mission Planning Systems	07	80,193	96,057					U
199	0208007F	Tactical Deception	07		14,338					U
200	0208064F	OPERATIONAL HQ - CYBER	07	5,323	2,115					U
201	0208087F	Distributed Cyber Warfare Operations	07	65,402	72,487					U
202	0208088F	AF Defensive Cyberspace Operations	07	29,255	18,449					U
203	0208097F	Joint Cyber Command and Control (JCC2)	07	35,060	79,079					U
204	0208099F	Unified Platform (UP)	07	91,886	91,893					U
208	0208288F	Intel Data Applications	07	1,224	493					U
209	0301025F	GeoBase	07		2,782					U
210	0301112F	Nuclear Planning and Execution System (NPES)	07	31,576	15,120					U
211	0301113F	Cyber Security Intelligence Support	07		5,224					U
218	0301401F	Air Force Space and Cyber Non-Traditional ISR for Battlespace Awareness	07	1,404	2,463					U
219	0302015F	E-4B National Airborne Operations Center (NAOC)	07	3,940	26,331					U

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Department of the Air Force
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Line No	Program Element Number	Item	Act	FY 2022 Total Supplemental Enactment	FY 2022 Total Enactment	FY 2023 Request	Sec
196	0207610F	Battlefield Abn Comm Node (BACN)	07		32,008		U
197	0207697F	Distributed Training and Exercises	07		4,007	4,628	U
198	0208006F	Mission Planning Systems	07		96,057	99,214	U
199	0208007F	Tactical Deception	07		14,338	17,074	U
200	0208064F	OPERATIONAL HQ - CYBER	07		2,115	2,347	U
201	0208087F	Distributed Cyber Warfare Operations	07		72,487	76,592	U
202	0208088F	AF Defensive Cyberspace Operations	07		18,449	8,367	U
203	0208097F	Joint Cyber Command and Control (JCC2)	07		79,079	80,740	U
204	0208099F	Unified Platform (UP)	07		91,893	107,548	U
208	0208288F	Intel Data Applications	07		493	1,065	U
209	0301025F	GeoBase	07		2,782	2,928	U
210	0301112F	Nuclear Planning and Execution System (NPES)	07		15,120		U
211	0301113F	Cyber Security Intelligence Support	07		5,224	8,972	U
218	0301401F	Air Force Space and Cyber Non-Traditional ISR for Battlespace Awareness	07		2,463	3,069	U
219	0302015F	E-4B National Airborne Operations Center (NAOC)	07		26,331	25,701	U

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220	0303131F	Minimum Essential Emergency Communications Network (MEECN)	07	38,298	58,165					U
221	0303140F	Information Systems Security Program	07	9,592	8,032					U
222	0303142F	Global Force Management - Data Initiative	07	1,294	452					U
223	0303248F	All Domain Common Platform	07		64,000					U
224	0303260F	Joint Military Deception Initiative	07							U
226	0304260F	Airborne SIGINT Enterprise	07	117,859	93,546					U
227	0304310F	Commercial Economic Analysis	07	3,887	3,770					U
230	0305015F	C2 Air Operations Suite - C2 Info Services	07							U
231	0305020F	CCMD Intelligence Information Technology	07	1,646	1,663					U
232	0305022F	ISR Modernization & Automation Dvmt (IMAD)	07	19,230	15,888					U
233	0305099F	Global Air Traffic Management (GATM)	07	4,133	4,672					U
234	0305103F	Cyber Security Initiative	07	368	290					U
235	0305111F	Weather Service	07	34,618	39,228					U
236	0305114F	Air Traffic Control, Approach, and Landing System (ATCALS)	07	5,729	15,749					U

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Line No	Program Element Number	Item	Act	FY 2022 Total Supplemental Enactment	FY 2022 Total Enactment	FY 2023 Request	Sec
220	0303131F	Minimum Essential Emergency Communications Network (MEECN)	07		58,165	41,171	U
221	0303140F	Information Systems Security Program	07		8,032	70,582	U
222	0303142F	Global Force Management - Data Initiative	07		452		U
223	0303248F	All Domain Common Platform	07		64,000		U
224	0303260F	Joint Military Deception Initiative	07			2,588	U
226	0304260F	Airborne SIGINT Enterprise	07		93,546	108,528	U
227	0304310F	Commercial Economic Analysis	07		3,770	4,542	U
230	0305015F	C2 Air Operations Suite - C2 Info Services	07			8,097	U
231	0305020F	CCMD Intelligence Information Technology	07		1,663	1,751	U
232	0305022F	ISR Modernization & Automation Dvmt (IMAD)	07		15,888	13,138	U
233	0305099F	Global Air Traffic Management (GATM)	07		4,672	4,895	U
234	0305103F	Cyber Security Initiative	07		290	91	U
235	0305111F	Weather Service	07		39,228	11,716	U
236	0305114F	Air Traffic Control, Approach, and Landing System (ATCALS)	07		15,749	8,511	U

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237	0305116F	Aerial Targets	07	438	1,528					U
240	0305128F	Security and Investigative Activities	07	415	223					U
241	0305146F	Defense Joint Counterintelligence Activities	07	4,881	8,733					U
243	0305179F	Integrated Broadcast Service (IBS)	07	8,848	21,335					U
244	0305202F	Dragon U-2	07	36,593	35,846					U
245	0305206F	Airborne Reconnaissance Systems	07	133,247	108,291					U
246	0305207F	Manned Reconnaissance Systems	07	14,679	14,799					U
247	0305208F	Distributed Common Ground/Surface Systems	07	14,126	24,568					U
248	0305220F	RQ-4 UAV	07	163,278	83,124					U
249	0305221F	Network-Centric Collaborative Targeting	07	15,022	17,224					U
250	0305238F	NATO AGS	07	36,664	19,473					U
251	0305240F	Support to DCGS Enterprise	07	33,486	40,421					U
252	0305600F	International Intelligence Technology and Architectures	07	13,603	14,473					U
253	0305881F	Rapid Cyber Acquisition	07	4,098	4,326					U
254	0305984F	Personnel Recovery Command & Ctrl (PRC2)	07	2,122	2,567					U

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Line No	Program Element Number	Item	Act	FY 2022 Total Supplemental Enactment	FY 2022 Total Enactment	FY 2023 Request	Sec
237	0305116F	Aerial Targets	07		1,528	1,365	U
240	0305128F	Security and Investigative Activities	07		223	223	U
241	0305146F	Defense Joint Counterintelligence Activities	07		8,733	8,328	U
243	0305179F	Integrated Broadcast Service (IBS)	07		21,335	22,123	U
244	0305202F	Dragon U-2	07		35,846	20,170	U
245	0305206F	Airborne Reconnaissance Systems	07		108,291	55,048	U
246	0305207F	Manned Reconnaissance Systems	07		14,799	14,590	U
247	0305208F	Distributed Common Ground/Surface Systems	07		24,568	26,901	U
248	0305220F	RQ-4 UAV	07		83,124	68,801	U
249	0305221F	Network-Centric Collaborative Targeting	07		17,224	17,564	U
250	0305238F	NATO AGS	07		19,473	826	U
251	0305240F	Support to DCGS Enterprise	07		40,421	28,774	U
252	0305600F	International Intelligence Technology and Architectures	07		14,473	15,036	U
253	0305881F	Rapid Cyber Acquisition	07		4,326	3,739	U
254	0305984F	Personnel Recovery Command & Ctrl (PRC2)	07		2,567	2,702	U

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Line No	Program Element Number	Item	Act	FY 2021 (Base + OCO)	FY 2022 Less Supplementals Enactment	FY 2022 Division B Division C P.L.117-43 Enactment*	FY 2022 Division B P.L.117-70 Enactment**	FY 2022 Division A P.L. 117-86 Enactment***	FY 2022 Division N P.L. 117-103 Enactment****	Sec
255	0307577F	Intelligence Mission Data (IMD)	07	6,266	6,169					U
256	0401115F	C-130 Airlift Squadron	07	48,698	12,552					U
257	0401119F	C-5 Airlift Squadrons (IF)	07	22,742	17,507					U
258	0401130F	C-17 Aircraft (IF)	07	11,653	16,360					U
259	0401132F	C-130J Program	07	6,179	24,112					U
260	0401134F	Large Aircraft IR Countermeasures (LAIRCM)	07	4,949	5,540					U
261	0401218F	KC-135s	07	4,583	3,564					U
262	0401318F	CV-22	07	17,823	17,189					U
263	0408011F	Special Tactics / Combat Control	07	7,457	6,640					U
264	0708055F	Maintenance, Repair & Overhaul System	07	20,422	26,921					U
265	0708610F	Logistics Information Technology (LOGIT)	07	32,122	11,071					U
266	0708611F	Support Systems Development	07	10,318						U
267	0804743F	Other Flight Training	07	1,281	5,999					U
268	0808716F	Other Personnel Activities	07		5,000					U
269	0901202F	Joint Personnel Recovery Agency	07	2,019	1,841					U
270	0901218F	Civilian Compensation Program	07	3,093	3,560					U
271	0901220F	Personnel Administration	07	1,536	3,368					U

R-123PBP: FY 2023 President's Budget (Total Base Published Version), as of March 25, 2022 at 15:49:52
*Includes enacted funding pursuant to the Extending Government Funding and Delivering Emergency Assistance Act (Public Law 117-43).
**Includes enacted funding pursuant to the Further Extending Government Funding Act (Public Law 117-70).
***Includes enacted funding pursuant to the Further Additional Extending Government Funding Act (Public Law 117-86).
****Includes enacted funding pursuant to the Ukraine Supplemental Appropriations Act (Public Law 117-103).

Department of the Air Force
FY 2023 President's Budget
Exhibit R-1 FY 2023 President's Budget
Total Obligational Authority
(Dollars in Thousands)

25 Mar 2022

Appropriation: 3600F Research, Development, Test & Eval, AF

Line No	Program Element Number	Item	Act	FY 2022 Total Supplemental Enactment	FY 2022 Total Enactment	FY 2023 Request	Sec
255	0307577F	Intelligence Mission Data (IMD)	07		6,169	6,332	U
256	0401115F	C-130 Airlift Squadron	07		12,552	407	U
257	0401119F	C-5 Airlift Squadrons (IF)	07		17,507	6,100	U
258	0401130F	C-17 Aircraft (IF)	07		16,360	25,387	U
259	0401132F	C-130J Program	07		24,112	11,060	U
260	0401134F	Large Aircraft IR Countermeasures (LAIRCM)	07		5,540	2,909	U
261	0401218F	KC-135s	07		3,564	12,955	U
262	0401318F	CV-22	07		17,189	10,121	U
263	0408011F	Special Tactics / Combat Control	07		6,640	6,297	U
264	0708055F	Maintenance, Repair & Overhaul System	07		26,921	19,892	U
265	0708610F	Logistics Information Technology (LOGIT)	07		11,071	5,271	U
266	0708611F	Support Systems Development	07				U
267	0804743F	Other Flight Training	07		5,999	2,214	U
268	0808716F	Other Personnel Activities	07		5,000		U
269	0901202F	Joint Personnel Recovery Agency	07		1,841	2,164	U
270	0901218F	Civilian Compensation Program	07		3,560	4,098	U
271	0901220F	Personnel Administration	07		3,368	3,191	U

R-123PBP: FY 2023 President's Budget (Total Base Published Version), as of March 25, 2022 at 15:49:52

Department of the Air Force
FY 2023 President's Budget
Exhibit R-1 FY 2023 President's Budget
Total Obligational Authority
(Dollars in Thousands)

25 Mar 2022

Appropriation: 3600F Research, Development, Test & Eval, AF

Line No	Program Element Number	Item	Act	FY 2021 (Base + OCO)	FY 2022 Less Supplementals Enactment	FY 2022 Division B Division C P.L.117-43 Enactment*	FY 2022 Division B P.L.117-70 Enactment**	FY 2022 Division A P.L. 117-86 Enactment***	FY 2022 Division N P.L. 117-103 Enactment****	Sec
272	0901226F	Air Force Studies and Analysis Agency	07	1,151	1,248					U
273	0901538F	Financial Management Information Systems Development	07	6,740	4,852					U
274	0901554F	Defense Enterprise Acntng and Mgt Sys (DEAMS)	07	39,628	54,400					U
275	1201921F	Service Support to STRATCOM - Space Activities	07	991						U
276	1202140F	Service Support to SPACECOM Activities	07	8,983	6,737					U
9999	9999999999	Classified Programs		14,909,669	17,011,053					U
		Operational Systems Development		20,022,756	23,240,309					
278	0608158F	Strategic Mission Planning and Execution System - Software Pilot Program	08							U
279	0608410F	Air & Space Operations Center (AOC) - Software Pilot Program	08							U
280	0608920F	Defense Enterprise Accounting and Management System (DEAMS) - Software Pilot Pro	08							U
281	0208087F	Distributed Cyber Warfare Operations	08							U
282	0308605F	Air Force Defensive Cyber Systems (AFDCS) - Software Pilot Program	08							U

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Department of the Air Force
FY 2023 President's Budget
Exhibit R-1 FY 2023 President's Budget
Total Obligational Authority
(Dollars in Thousands)

25 Mar 2022

Appropriation: 3600F Research, Development, Test & Eval, AF

Line No	Program Element Number	Item	Act	FY 2022 Total Supplemental Enactment	FY 2022 Total Enactment	FY 2023 Request	Sec
272	0901226F	Air Force Studies and Analysis Agency	07		1,248	899	U
273	0901538F	Financial Management Information Systems Development	07		4,852	5,421	U
274	0901554F	Defense Enterprise Acntng and Mgt Sys (DEAMS)	07		54,400		U
275	1201921F	Service Support to STRATCOM - Space Activities	07				U
276	1202140F	Service Support to SPACECOM Activities	07		6,737	13,766	U
9999	9999999999	Classified Programs			17,011,053	17,240,641	U
		Operational Systems Development			23,240,309	23,090,569	
278	0608158F	Strategic Mission Planning and Execution System - Software Pilot Program	08			100,167	U
279	0608410F	Air & Space Operations Center (AOC) - Software Pilot Program	08			177,827	U
280	0608920F	Defense Enterprise Accounting and Management System (DEAMS) - Software Pilot Pro	08			136,202	U
281	0208087F	Distributed Cyber Warfare Operations	08			37,346	U
282	0308605F	Air Force Defensive Cyber Systems (AFDCS) - Software Pilot Program	08			240,926	U

R-123PBP: FY 2023 President's Budget (Total Base Published Version), as of March 25, 2022 at 15:49:52

Department of the Air Force
FY 2023 President's Budget
Exhibit R-1 FY 2023 President's Budget
Total Obligational Authority
(Dollars in Thousands)

25 Mar 2022

Appropriation: 3600F Research, Development, Test & Eval, AF

Line No	Program Element Number	Item	Act	FY 2021 (Base + OCO)	FY 2022 Less Supplementals Enactment	FY 2022 Division B Division C P.L.117-43 Enactment*	FY 2022 Division B P.L.117-70 Enactment**	FY 2022 Division A P.L. 117-86 Enactment***	FY 2022 Division N P.L. 117-103 Enactment****	Sec
283	0308606F	All Domain Common Platform (ADCP) - Software Pilot Program	08							U
284	0308607F	Air Force Weather Programs - Software Pilot Program	08							U
285	0308608F	Electronic Warfare Integrated Reprogramming (EWIR) - Software Pilot Program	08							U
		Software and Digital Technology Pilot Progr								
Total Research, Development, Test & Eval, AF				36,022,139	41,592,913				47,500	

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Department of the Air Force
FY 2023 President's Budget
Exhibit R-1 FY 2023 President's Budget
Total Obligational Authority
(Dollars in Thousands)

25 Mar 2022

Appropriation: 3600F Research, Development, Test & Eval, AF

Line No	Program Element Number	Item	Act	FY 2022 Total Supplemental Enactment	FY 2022 Total Enactment	FY 2023 Request	Sec
283	0308606F	All Domain Common Platform (ADCP) - Software Pilot Program	08			190,112	U
284	0308607F	Air Force Weather Programs - Software Pilot Program	08			58,063	U
285	0308608F	Electronic Warfare Integrated Reprogramming (EWIR) - Software Pilot Program	08			5,794	U
		Software and Digital Technology Pilot Progr				946,437	
Total Research, Development, Test & Eval, AF				47,500	41,640,413	44,134,301	

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Department of the Air Force
FY 2023 President's Budget
Exhibit R-1 FY 2023 President's Budget
Total Obligational Authority
(Dollars in Thousands)

25 Mar 2022

Summary Recap of Budget Activities	FY 2021 (Base + OCO)	FY 2022 Less Supplementals Enactment	FY 2022 Division B Division C P.L.117-43 Enactment*	FY 2022 Division B P.L.117-70 Enactment**	FY 2022 Division A P.L. 117-86 Enactment***	FY 2022 Division N P.L. 117-103 Enactment****
Applied Research	214,494	286,505				
Advanced Technology Development		238,584				
Advanced Component Development & Prototypes	1,335,818	1,598,560				
System Development & Demonstration	3,638,636	3,167,810				
Management Support	537,965	471,142				
Operational System Development	4,624,888	5,680,275				
Software & Digital Technology Pilot Programs	155,067	154,529				
Total Research, Development, Test & Evaluation	10,506,868	11,597,405				

Summary Recap of FYDP Programs						
Research and Development						
Space	6,969,975	7,034,096				
Classified Programs	3,536,893	4,563,309				
Total Research, Development, Test & Evaluation	10,506,868	11,597,405				

R-123PBP: FY 2023 President's Budget (Total Base Published Version), as of March 25, 2022 at 15:49:52
*Includes enacted funding pursuant to the Extending Government Funding and Delivering Emergency Assistance Act (Public Law 117-43).
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Department of the Air Force
FY 2023 President's Budget
Exhibit R-1 FY 2023 President's Budget
Total Obligational Authority
(Dollars in Thousands)

25 Mar 2022

Summary Recap of Budget Activities	FY 2022 Total Supplemental Enactment	FY 2022 Total Enactment	FY 2023 Request
Applied Research		286,505	243,737
Advanced Technology Development		238,584	564,215
Advanced Component Development & Prototypes		1,598,560	2,992,458
System Development & Demonstration		3,167,810	5,335,659
Management Support		471,142	424,943
Operational System Development		5,680,275	6,103,307
Software & Digital Technology Pilot Programs		154,529	155,053
Total Research, Development, Test & Evaluation		11,597,405	15,819,372

Summary Recap of FYDP Programs			
Research and Development			816
Space		7,034,096	10,845,198
Classified Programs		4,563,309	4,973,358
Total Research, Development, Test & Evaluation		11,597,405	15,819,372

R-123PBP: FY 2023 President's Budget (Total Base Published Version), as of March 25, 2022 at 15:49:52

Master Program Element Table of Contents (by Budget Activity then Line Item Number)

Appropriation 3600: Research, Development, Test & Evaluation, Air Force

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Master Program Element Table of Contents (Alphabetically by Program Element Title)

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Research, Development, Test & Eval, AF

Date: April 2022

Department of the Air Force
TOTAL CIVILIAN PERSONNEL COSTS
FY 2023 Enactment President's Budget
(FY 2021)

	a Begin Strength	b End Strength	c FTEs	d Basic Comp	e Overtime Pay	f Holiday Pay	g Other O.C.11	h Total Variables
Direct Funded Personnel (includes OC 13)	19,660	17,831	19,354	2,800,044			4,174	4,174
D1. US Direct Hire (USDH)	19,658	17,829	19,352	2,799,720			4,174	4,174
D1a. Senior Executive Schedule	13	13	13	2,005			45	45
D1b. General Schedule	16,310	14,787	16,049	2,580,411			4,129	4,129
D1c. Special Schedule								
D1d. Wage System	3,335	3,029	3,290	217,304				
D1e. Highly Qualified Experts								
D1f. Other								
D2. Direct Hire Program Foreign Nationals (DHFN)								
D3. Total Direct Hire	19,658	17,829	19,352	2,799,720			4,174	4,174
D4. Indirect Hire Foreign Nationals (IHFN)	2	2	2	324				
Subtotal - Direct Funded (excludes OC 13)	19,660	17,831	19,354	2,800,044			4,174	4,174
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)	4,026	4,141	2,449	351,805				
R1. US Direct Hire (USDH)	4,026	4,141	2,449	351,805				
R1a. Senior Executive Schedule								
R1b. General Schedule	4,026	4,141	2,449	351,805				
R1c. Special Schedule								
R1d. Wage System								
R1e. Highly Qualified Experts								
R1f. Other								
R2. Direct Hire Program Foreign Nationals (DHFN)								
R3. Total Direct Hire	4,026	4,141	2,449	351,805				
R4. Indirect Hire Foreign Nationals (IHFN)								
Subtotal - Reimbursable Funded (excludes OC 13)	4,026	4,141	2,449	351,805				
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								

Research, Development, Test & Eval, AF

Date: April 2022

Department of the Air Force
TOTAL CIVILIAN PERSONNEL COSTS
FY 2023 Enactment President's Budget
(FY 2021)

	a Begin Strength	b End Strength	c FTEs	d Basic Comp	e Overtime Pay	f Holiday Pay	g Other O.C.11	h Total Variables
Total Funded Personnel (includes OC 13)	23,686	21,972	21,803	3,151,849			4,174	4,174
T1. US Direct Hire (USDH)	23,684	21,970	21,801	3,151,525			4,174	4,174
T1a. Senior Executive Schedule	13	13	13	2,005			45	45
T1b. General Schedule	20,336	18,928	18,498	2,932,216			4,129	4,129
T1c. Special Schedule								
T1d. Wage System	3,335	3,029	3,290	217,304				
T1e. Highly Qualified Experts								
T1f. Other								
T2. Direct Hire Program Foreign Nationals (DHFN)								
T3. Total Direct Hire	23,684	21,970	21,801	3,151,525			4,174	4,174
T4. Indirect Hire Foreign Nationals (IHFN)	2	2	2	324				
Subtotal - Total Funded (excludes OC 13)	23,686	21,972	21,803	3,151,849			4,174	4,174
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								

Research, Development, Test & Eval, AF

Date: April 2022

Department of the Air Force
TOTAL CIVILIAN PERSONNEL COSTS
FY 2023 Enactment President's Budget
(FY 2022)

	a Begin Strength	b End Strength	c FTEs	d Basic Comp	e Overtime Pay	f Holiday Pay	g Other O.C.11	h Total Variables
Direct Funded Personnel (includes OC 13)	17,831	18,218	18,325	1,930,128	6,499	1,915	53,152	61,566
D1. US Direct Hire (USDH)	17,829	18,216	18,323	1,929,816	6,499	1,915	53,152	61,566
D1a. Senior Executive Schedule	13	13	13	2,005			45	45
D1b. General Schedule	14,787	15,110	15,172	1,701,929	1,988	1,216	39,891	43,095
D1c. Special Schedule								
D1d. Wage System	3,029	3,093	3,138	225,882	4,511	699	13,216	18,426
D1e. Highly Qualified Experts								
D1f. Other								
D2. Direct Hire Program Foreign Nationals (DHFN)								
D3. Total Direct Hire	17,829	18,216	18,323	1,929,816	6,499	1,915	53,152	61,566
D4. Indirect Hire Foreign Nationals (IHFN)	2	2	2	312				
Subtotal - Direct Funded (excludes OC 13)	17,831	18,218	18,325	1,930,128	6,499	1,915	53,152	61,566
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)	4,141	4,153	4,096	352,124	406	248	8,152	8,806
R1. US Direct Hire (USDH)	4,141	4,153	4,096	352,124	406	248	8,152	8,806
R1a. Senior Executive Schedule								
R1b. General Schedule	4,141	4,153	4,096	352,124	406	248	8,152	8,806
R1c. Special Schedule								
R1d. Wage System								
R1e. Highly Qualified Experts								
R1f. Other								
R2. Direct Hire Program Foreign Nationals (DHFN)								
R3. Total Direct Hire	4,141	4,153	4,096	352,124	406	248	8,152	8,806
R4. Indirect Hire Foreign Nationals (IHFN)								
Subtotal - Reimbursable Funded (excludes OC 13)	4,141	4,153	4,096	352,124	406	248	8,152	8,806
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								

Department of the Air Force
TOTAL CIVILIAN PERSONNEL COSTS
FY 2023 Enactment President's Budget
(FY 2022)

Date: April 2022

	a Begin Strength	b End Strength	c FTEs	d Basic Comp	e Overtime Pay	f Holiday Pay	g Other O.C.11	h Total Variables
Total Funded Personnel (includes OC 13)	21,972	22,371	22,421	2,282,252	6,905	2,163	61,304	70,372
T1. US Direct Hire (USDH)	21,970	22,369	22,419	2,281,940	6,905	2,163	61,304	70,372
T1a. Senior Executive Schedule	13	13	13	2,005			45	45
T1b. General Schedule	18,928	19,263	19,268	2,054,053	2,394	1,464	48,043	51,901
T1c. Special Schedule	3,029	3,093	3,138	225,882	4,511	699	13,216	18,426
T1d. Wage System								
T1e. Highly Qualified Experts								
T1f. Other								
T2. Direct Hire Program Foreign Nationals (DHFN)								
T3. Total Direct Hire	21,970	22,369	22,419	2,281,940	6,905	2,163	61,304	70,372
T4. Indirect Hire Foreign Nationals (IHFN)	2	2	2	312				
Subtotal - Total Funded (excludes OC 13)	21,972	22,371	22,421	2,282,252	6,905	2,163	61,304	70,372
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
FY 2023 Enactment President's Budget
(FY 2023)

Date: April 2022

	a Begin Strength	b End Strength	c FTEs	d Basic Comp	e Overtime Pay	f Holiday Pay	g Other O.C.11	h Total Variables
Direct Funded Personnel (includes OC 13)	18,218	19,087	18,944	2,572,425	6,505	1,916	53,186	61,607
D1. US Direct Hire (USDH)	18,216	19,085	18,942	2,572,107	6,505	1,916	53,186	61,607
D1a. Senior Executive Schedule	13	13	13	2,005			45	45
D1b. General Schedule	15,110	15,816	15,673	2,344,011	1,989	1,217	39,925	43,131
D1c. Special Schedule								
D1d. Wage System	3,093	3,256	3,256	226,091	4,516	699	13,216	18,431
D1e. Highly Qualified Experts								
D1f. Other								
D2. Direct Hire Program Foreign Nationals (DHFN)								
D3. Total Direct Hire	18,216	19,085	18,942	2,572,107	6,505	1,916	53,186	61,607
D4. Indirect Hire Foreign Nationals (IHFN)	2	2	2	318				
Subtotal - Direct Funded (excludes OC 13)	18,218	19,087	18,944	2,572,425	6,505	1,916	53,186	61,607
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)	4,153	4,091	4,091	532,000	475	290	9,532	10,297
R1. US Direct Hire (USDH)	4,153	4,091	4,091	532,000	475	290	9,532	10,297
R1a. Senior Executive Schedule								
R1b. General Schedule	4,153	4,091	4,091	532,000	475	290	9,532	10,297
R1c. Special Schedule								
R1d. Wage System								
R1e. Highly Qualified Experts								
R1f. Other								
R2. Direct Hire Program Foreign Nationals (DHFN)								
R3. Total Direct Hire	4,153	4,091	4,091	532,000	475	290	9,532	10,297
R4. Indirect Hire Foreign Nationals (IHFN)								
Subtotal - Reimbursable Funded (excludes OC 13)	4,153	4,091	4,091	532,000	475	290	9,532	10,297
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								

Research, Development, Test & Eval, AF

Date: April 2022

Department of the Air Force
TOTAL CIVILIAN PERSONNEL COSTS
FY 2023 Enactment President's Budget
(FY 2023)

	a Begin Strength	b End Strength	c FTEs	d Basic Comp	e Overtime Pay	f Holiday Pay	g Other O.C.11	h Total Variables
Total Funded Personnel (includes OC 13)	22,371	23,178	23,035	3,104,425	6,980	2,206	62,718	71,904
T1. US Direct Hire (USDH)	22,369	23,176	23,033	3,104,107	6,980	2,206	62,718	71,904
T1a. Senior Executive Schedule	13	13	13	2,005			45	45
T1b. General Schedule	19,263	19,907	19,764	2,876,011	2,464	1,507	49,457	53,428
T1c. Special Schedule								
T1d. Wage System	3,093	3,256	3,256	226,091	4,516	699	13,216	18,431
T1e. Highly Qualified Experts								
T1f. Other								
T2. Direct Hire Program Foreign Nationals (DHFN)								
T3. Total Direct Hire	22,369	23,176	23,033	3,104,107	6,980	2,206	62,718	71,904
T4. Indirect Hire Foreign Nationals (IHFN)	2	2	2	318				
Subtotal - Total Funded (excludes OC 13)	22,371	23,178	23,035	3,104,425	6,980	2,206	62,718	71,904
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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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603036F / *Armament Demonstration and Validation*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	0.000	0.000	125.688	0.000	125.688	152.948	219.689	56.331	52.191	0.000	606.847
643036: *Armament Demonstration and Validation*	-	0.000	0.000	125.688	0.000	125.688	152.948	219.689	56.331	52.191	0.000	606.847
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program, BA 4, PE 0603036F Armament Demonstration and Validation, project 643036, Modular Advanced Missile (MAM) is not a new start. Work started in FY 2022 and this is a continuation of work conducted under a separate PE.

The Armament Demonstration and Validation Program Element provides key linkage between Research and Development, and fielding of advanced capabilities. It will develop, mature, and demonstrate new or emerging armament technologies, processes, interfaces, mission planning, special test equipment, and resources. Armament Demonstration and Validation will design, develop, and perform demonstrations of prototypes and technologies to inform future acquisition and production decisions. Efforts are focused on current and future requirements and technologies, reduce life-cycle costs, and increased competition for system capability upgrades. Activities leverage the efforts of the Science and Technology community. This effort will include lab, bench, integration, ground and air demonstrations and validation of emerging/ evolving technologies and systems via weapon scalable/modular architecture and Weapon Government Reference Architecture (GRA) compliant system performance.

This effort will mature and demonstrate the tenants of model based systems engineering, modular open systems architecture, agile software development, modeling, simulation and analysis, and extend these tenants to improve manufacturing processes.

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 0605831F. In FY 2023, $5.000 million is forecasted for civilian pay expenses in this program element.

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603036F / *Armament Demonstration and Validation*	

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	125.688	0.000	125.688
Total Adjustments	0.000	0.000	125.688	0.000	125.688
• 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	125.688	0.000	125.688

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Modular Advanced Missile (MAM)/Air-to-Air Missile Prototype (AAMP)	-	0.000	124.688
Description: The Modular Advanced Missile (MAM) project will develop, mature, and demonstrate new Medium Range Missile (MRM) technologies, processes, and resources. MAM will design, develop, and test a number of prototype missiles to inform future MRM acquisition and production decisions. ***FY 2022 Plans:*** Not Applicable ***FY 2023 Plans:*** This program, BA 4, PE 0603036F Armament Demonstration and Validation, project 643036, Modular Advanced Missile (MAM) is not a new start. Continue detailed digital design of prototype weapons for future air launched and bench demonstrations. Order long-lead material necessary to produce prototype missiles for both air launched kinematic demonstration and bench demonstrations of form factored prototype missiles. Subsystem and system level integration will begin, as long-lead delivery schedule allows. Integrated Test Team will begin test planning with contractors. Weapon integration on test aircraft planning and design activities will occur. Rapidly respond to evolving warfighter priorities and emerging requirements. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 funding increased compared to FY 2022 by $124.688 million. Modular Advanced Missile is not a new start. Work started in FY 2022 and this is a continuation of work conducted under a separate PE.			
Title: Emerging & Enabling Armament Technology	-	0.000	1.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603036F / *Armament Demonstration and Validation*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Description: Conduct risk reduction and prototyping activities on emerging and enabling technologies to inform future acquisition and production decisions for the armament portfolio, informed by internal and external stakeholders. ***FY 2022 Plans:*** Not applicable ***FY 2023 Plans:*** Perform risk reduction through prototyping of critical components. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 funding increased compared to FY 2022 by $1.000 million. Work started in FY 2022 and this is a continuation of work conducted under a separate PE.			
Accomplishments/Planned Programs Subtotals	-	0.000	125.688

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

Accomplish studies, analysis, concept demonstration, prototyping and engineering; efforts will be conducted using contracting strategies deemed most appropriate, generally using competitive contracts and/or other obligating documentation considered most appropriate by the obligating and performing agencies involved.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603036F / *Armament Demonstration and Validation*	Project (Number/Name) 643036 / *Armament Demonstration and Validation*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Development and Integration	C/CPFF	Various : TBD	-	-		-		114.114	Sep 2023	-		114.114	Continuing	Continuing	-
Emerging & Enabling Armament Technology	TBD	TBD : TBD	-	-		-		1.000		-		1.000	Continuing	Continuing	-
		Subtotal	-	-		-		115.114		-		115.114	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Platform Integration	PO	96th Test Wing : Eglin, AFB, FL	-	-		-		1.482	Nov 2022	-		1.482	Continuing	Continuing	-
		Subtotal	-	-		-		1.482		-		1.482	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Other Government Costs	TBD	TBD : TBD	-	-		-		0.601	Nov 2022	-		0.601	Continuing	Continuing	-
		Subtotal	-	-		-		0.601		-		0.601	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Administration	Various	Various : Various	-	-		-		8.491	May 2023	-		8.491	Continuing	Continuing	-
		Subtotal	-	-		-		8.491		-		8.491	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603036F / *Armament Demonstration a nd Validation*	Project (Number/Name) 643036 / *Armament Demonstration and Validation*	

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		-		125.688		-		125.688	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603036F / *Armament Demonstration and Validation*	**Project (Number/Name)** 643036 / *Armament Demonstration and Validation*

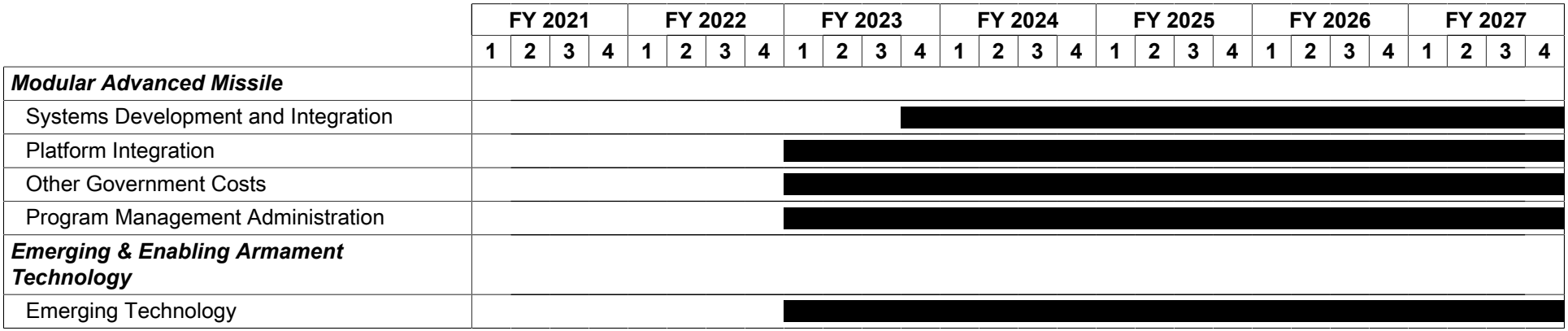

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603036F / *Armament Demonstration and Validation*	**Project (Number/Name)** 643036 / *Armament Demonstration and Validation*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Modular Advanced Missile				
Systems Development and Integration	4	2023	4	2027
Platform Integration	1	2023	4	2027
Other Government Costs	1	2023	4	2027
Program Management Administration	1	2023	4	2027
Emerging & Enabling Armament Technology				
Emerging Technology	1	2023	4	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603260F / *Intelligence Advanced Development*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	4.312	5.795	6.101	0.000	6.101	6.223	3.791	3.870	3.957	Continuing	Continuing
64536A: *INTELLIGENCE EXPLOITATION TOOLS (IET)*	-	3.124	4.600	4.842	0.000	4.842	4.939	2.482	2.534	2.591	Continuing	Continuing
64537A: *INTELLIGENCE ANALYSIS CAPABILITIES (IAC)*	-	1.188	1.195	1.259	0.000	1.259	1.284	1.309	1.336	1.366	Continuing	Continuing

A. Mission Description and Budget Item Justification

Intelligence Advanced Development (IAD) develops and demonstrates technology required to support warfighter needs for timely all source intelligence information. IAD supports global awareness, consistent battlespace knowledge, precision information, and the execution of time critical missions. IAD focuses on enhancing defense intelligence capabilities through exploration and development of innovative tools including data analytics for mining and exploitation, machine-learning, and software automation. IAD projects provide improved on-time information to the warfighter using new and existing data sources, streamlining data analysis, thus reducing the footprint required, and enhancing performance. These support the Anti-Access/Area Denial (A2/AD) Contested/Congested Degraded Operations (CDO) problem set. The Air Force Research Lab, Rome Research Site, Information Intelligence Systems and Analysis Division (AFRL/RIE), works directly with users, employing evolutionary approaches and integrating finished modules directly into the field.

The programs are oriented toward specific shortfalls and deficiencies as documented by the Major Commands (MAJCOMs), Unified Commands, and intelligence organizations in their mission and functional area plans. This PE expedites technology transition from the laboratory to operational users via rapid prototyping. It is focused on technology insertion to correct AF intelligence deficiencies at the tactical and operational levels. The PE bridges the transition of new technologies from Advance Technology Demonstrations (ATDs) and Integrated Technology Thrust Programs (ITTPs) into current/new systems, and supports the associated Defense Technology Objectives (DTOs). IAD may also reallocate existing resources to support out-of-cycle new/updated warfighter requirements.

Requirements for this PE are identified and prioritized by Air Combat Command (ACC). Development of new/improved capabilities to meet the requirements are managed by AFRL/RIE. Prototype products, usually in the form of software, are provided to users in incremental capability spirals for operational environment evaluation. Additionally, IAD projects increasingly participate in on-going experimentation and prototype software development in support of the Advanced Battle Management Systems On-Ramp activities.

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 PY22 $00.351M was expended for civilian pay expenses in this program element, and in CY23 $00.200M is forecasted for civilian pay expenses in this program element.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603260F / *Intelligence Advanced Development*

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

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	4.312	5.795	0.000	0.000	0.000
Current President's Budget	4.312	5.795	6.101	0.000	6.101
Total Adjustments	0.000	0.000	6.101	0.000	6.101
• 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	6.101	0.000	6.101

Change Summary Explanation

FY23: The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603260F / *Intelligence Advanced Development*	Project (Number/Name) 64536A / *INTELLIGENCE EXPLOITATION TOOLS (IET)*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
64536A: *INTELLIGENCE EXPLOITATION TOOLS (IET)*	-	3.124	4.600	4.842	0.000	4.842	4.939	2.482	2.534	2.591	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The mission is to develop prototypes which encompass several areas of intelligence exploitation including the advancement of all source correlation and fusion for the intelligence analyst. Projects include development of innovative data analytics, machine-learning, and automated software tools. The intent is to enhance the overall situational awareness for Air Force, DoD, and Coalition groups which have requirements to correlate various sources of intelligence information, including Communications Intelligence (COMINT), Electronics Intelligence (ELINT), Imagery Intelligence (IMINT), Geospatial Intelligence (GEOINT), Measurement and Signature Intelligence (MASINT), Signals Intelligence (SIGINT), Publicly Available Information (PAI) and others, in a timely manner. IET may reallocate existing resources to support out-of-cycle new/updated warfighter requirements.

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 PY22 $00.351M was expended for civilian pay expenses in this program element, and in CY23 $00.200M is forecasted for civilian pay expenses in this program element.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Intelligence Exploitation Tools (IET)	3.124	4.600	4.842
Description: IET addresses the accurate and timely interpretation of various Intelligence data sources (such as digital imagery, video, documents, signals) by developing and evaluating methods to index, exploit, and manipulate disparate data products using analytics, machine-learning, and software automation. This provides the analyst with the ability to rapidly search and fuse multiple intelligence sources for improved situational awareness and to better detect anomalies. Cross domain tools enable data exploitation at multiple classification levels. In addition, methods to improve analysis of current and future foreign weapon systems are developed. IET provides enhanced warning and accuracy to allow national and military authorities a greater range of options to avert, diminish or control a crisis.			
FY 2022 Plans: - Developing multi-INT entity resolution capabilities, utilizing cataloged repositories, which will enable analysts to apply automated machine intelligence and prediction tools to identify trends and mission statistics for SIGINT and DCGS users			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603260F / *Intelligence Advanced Development*	**Project (Number/Name)** 64536A / *INTELLIGENCE EXPLOITATION TOOLS (IET)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
- Developing tools to enhance, automate, correlate, & fuse multi-source, multi-domain ISR data for NASIC situational awareness & threat assessment - Developing prototypes to improve effects & operations across the ISR battlespace via cyber response capability in support of DCGS cyber defense response initiatives - Developing a scalable FMV Cloud Pilot capability in support of DCGS, enabling cloud based integration of AI/ML algorithms - Developing streamlined Battle Damage Assessment process via automation and implement cross-domain solutions to collate intel data for physical and functional damage assessments for analyst review toolkits ***FY 2023 Plans:*** - Will develop multi-INT entity resolution capabilities, utilizing cataloged repositories, which will enable analysts to apply automated machine intelligence and prediction tools to identify trends and mission statistics for SIGINT and DCGS users - Will develop tools to enhance, automate, correlate, & fuse multi-source, multi-domain ISR data for NASIC situational awareness & threat assessment - Will develop prototypes to improve effects & operations across the ISR battlespace via cyber response capability in support of DCGS cyber defense response initiatives - Will develop a scalable FMV Cloud Pilot capability in support of DCGS, enabling cloud based integration of AI/ML algorithms - Will enhance streamlined Battle Damage Assessment process via automation and implement cross-domain solutions to collate intel data for physical and functional damage assessments for analyst review toolkits -- Will continue to mature technology associated with the development and training of machine learning algorithms to recognize and geolocate bomb impact cratering and damage on imagery (EO, IR, and SAR) -- Software will enable extraction of relevant parameters for ingestion into Integrated Munitions Effects Assessment (IMEA) for additional post-strike analysis ***FY 2022 to FY 2023 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603260F / *Intelligence Advanced Development*	**Project (Number/Name)** 64536A / *INTELLIGENCE EXPLOITATION TOOLS (IET)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Adding additional capability for AI and ML software enhancements			
Accomplishments/Planned Programs Subtotals	3.124	4.600	4.842

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Requirements for new/improved techniques for operational employment of simulation models are identified and prioritized by ACC. Development of the new/improved capabilities to meet these requirements is managed by Air Force Research Laboratory (AFRL) Rome Research Site. Prototype products (usually software), once evaluated by the users, are transitioned from the laboratory to the operational community in spirals. All major contracts within this project are awarded after full and open competition.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603260F / *Intelligence Advanced Development*	Project (Number/Name) 64536A / *INTELLIGENCE EXPLOITATION TOOLS (IET)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Intelligence Exploitation Tools (IET)	Various	Various : Various	-	2.674	Dec 2020	4.130	Dec 2021	4.362	Dec 2022	-		4.362	Continuing	Continuing	-
		Subtotal	-	2.674		4.130		4.362		-		4.362	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMA	Various	AFRL - Information Directorate : Rome, NY	-	0.450	Nov 2020	0.470	Nov 2021	0.480	Nov 2022	-		0.480	Continuing	Continuing	-
		Subtotal	-	0.450		0.470		0.480		-		0.480	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	3.124		4.600		4.842		-		4.842	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603260F / *Intelligence Advanced Development*	**Project (Number/Name)** 64536A / *INTELLIGENCE EXPLOITATION TOOLS (IET)*

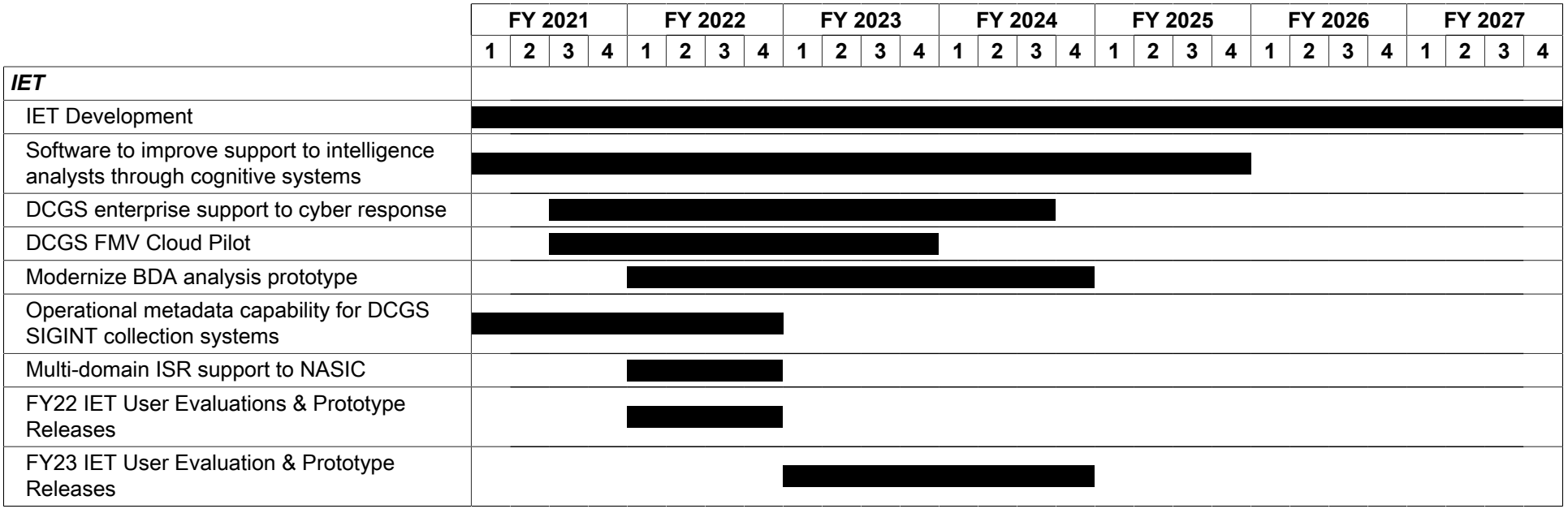

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603260F / *Intelligence Advanced Development*	**Project (Number/Name)** 64536A / *INTELLIGENCE EXPLOITATION TOOLS (IET)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
IET				
IET Development	1	2021	4	2027
Software to improve support to intelligence analysts through cognitive systems	1	2021	4	2025
DCGS enterprise support to cyber response	3	2021	3	2024
DCGS FMV Cloud Pilot	3	2021	4	2023
Modernize BDA analysis prototype	1	2022	4	2024
Operational metadata capability for DCGS SIGINT collection systems	1	2021	4	2022
Multi-domain ISR support to NASIC	1	2022	4	2022
FY22 IET User Evaluations & Prototype Releases	1	2022	4	2022
FY23 IET User Evaluation & Prototype Releases	1	2023	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603260F / *Intelligence Advanced Development*	Project (Number/Name) 64537A / *INTELLIGENCE ANALYSIS CAPABILITIES (IAC)*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
64537A: *INTELLIGENCE ANALYSIS CAPABILITIES (IAC)*	-	1.188	1.195	1.259	0.000	1.259	1.284	1.309	1.336	1.366	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The mission is to provide continuing development and upgrades of threat analysis capabilities to produce integrated, predictive air and space intelligence to enable military operations, force modernization decisions, and policy making. Products from IAC allow the Intelligence Analyst to accelerate and increase the accuracy of threat estimates and system descriptions to deployed operational forces. Each of the development projects within the IAC program portfolio transition technologies to the operational communities through the incremental release of upgraded versions over a period of years as development projects progress towards the final configuration. IAC may reallocate existing resources to support out-of-cycle new/ updated warfighter requirements.

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 PY22 $00.351M was expended for civilian pay expenses in this program element, and in CY23 $00.200M is forecasted for civilian pay expenses in this program element.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Intelligence Analysis Capabilities (IAC) Development	1.188	1.195	1.259
Description: IAC develops tools and algorithms for Intelligence Analysts with the ability to produce accurate, predictive, relevant, and timely intelligence that supports client processes, operational planning, and mission execution. Methods include data analytics techniques, machine-learning, and software automation. IAC develops new and upgraded analysis, modeling and simulation tools focused on intelligence production supporting AF operational and developmental all source analysis functions.			
FY 2022 Plans: - Developing prototype for collaborative environment to connect intelligence requirements with exploitation teams to increase the level of information available to analysts to improve tactical level intelligence production and reporting - Developing prototype for computational data handling tools to ingest disparate data types across multiple disciplines within Air and Space Operations Centers to disseminate and display to decision makers through existing Common Operational Pictures and Dashboards			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603260F / *Intelligence Advanced Development*	**Project (Number/Name)** 64537A / *INTELLIGENCE ANALYSIS CAPABILITIES (IAC)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
- Completing development of a query class prototype system that will enable users to search large volumes of disparate multimodal and multilingual data sources; accessible for use by DoD and IC cloud service architectures - Performing test and evaluation of Mobile Command, Control, Communication, and Computer (Mobile C4) database and visualization capability for intelligence operators; integrated into National Air and Space Intelligence Center (NASIC) toolset - Completing development of a machine learning (ML) collaboration & deployment framework for AF DCGS; provide intel ops with an intuitive environment that simplifies deployment/sharing of ML algorithms/ models & operational intel datasets ***FY 2023 Plans:*** - Will develop prototype for collaborative environment to connect intelligence requirements with exploitation teams to increase the level of information available to analysts to improve tactical level intelligence production and reporting - Will develop prototype for computational data handling tools to ingest disparate data types across multiple disciplines within Air and Space Operations Centers to disseminate and display to decision makers through existing Common Operational Pictures and Dashboards - Will perform test and evaluation of Mobile Command, Control, Communication, and Computer (Mobile C4) database and visualization capability for intelligence operators; integrated into National Air and Space Intelligence Center (NASIC) toolset - Will initiate development of Advanced Collection Recommendation Environment -- Automated Data Fusion and Cloud Processing to support machine to machine data sharing ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Slight increase to funding in support of Cloud Processing and Data Fusion efforts			
Accomplishments/Planned Programs Subtotals	1.188	1.195	1.259

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603260F / *Intelligence Advanced Development*	**Project (Number/Name)** 64537A / *INTELLIGENCE ANALYSIS CAPABILITIES (IAC)*

D. Acquisition Strategy

Requirements of new/upgraded intelligence analysis tools are identified and prioritized by the ACC. Development of capabilities to meet these requirements is managed by AFRL Rome Research Site. Prototype products (usually software), once evaluated by the users, are fielded in incremental capability spirals. All major contracts within this project are awarded after full and open competition.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603260F / *Intelligence Advanced Development*	**Project (Number/Name)** 64537A / *INTELLIGENCE ANALYSIS CAPABILITIES (IAC)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
IAC	Various	Various : Various	-	1.028	Nov 2020	1.035	Dec 2021	1.083	Dec 2022	-		1.083	Continuing	Continuing	-
		Subtotal	-	1.028		1.035		1.083		-		1.083	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMA	Various	AFRL - Information Directorate : Rome, NY	-	0.160	Nov 2020	0.160	Nov 2021	0.176	Nov 2022	-		0.176	Continuing	Continuing	-
		Subtotal	-	0.160		0.160		0.176		-		0.176	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	1.188		1.195		1.259		-		1.259	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603260F / *Intelligence Advanced Development*	**Project (Number/Name)** 64537A / *INTELLIGENCE ANALYSIS CAPABILITIES (IAC)*

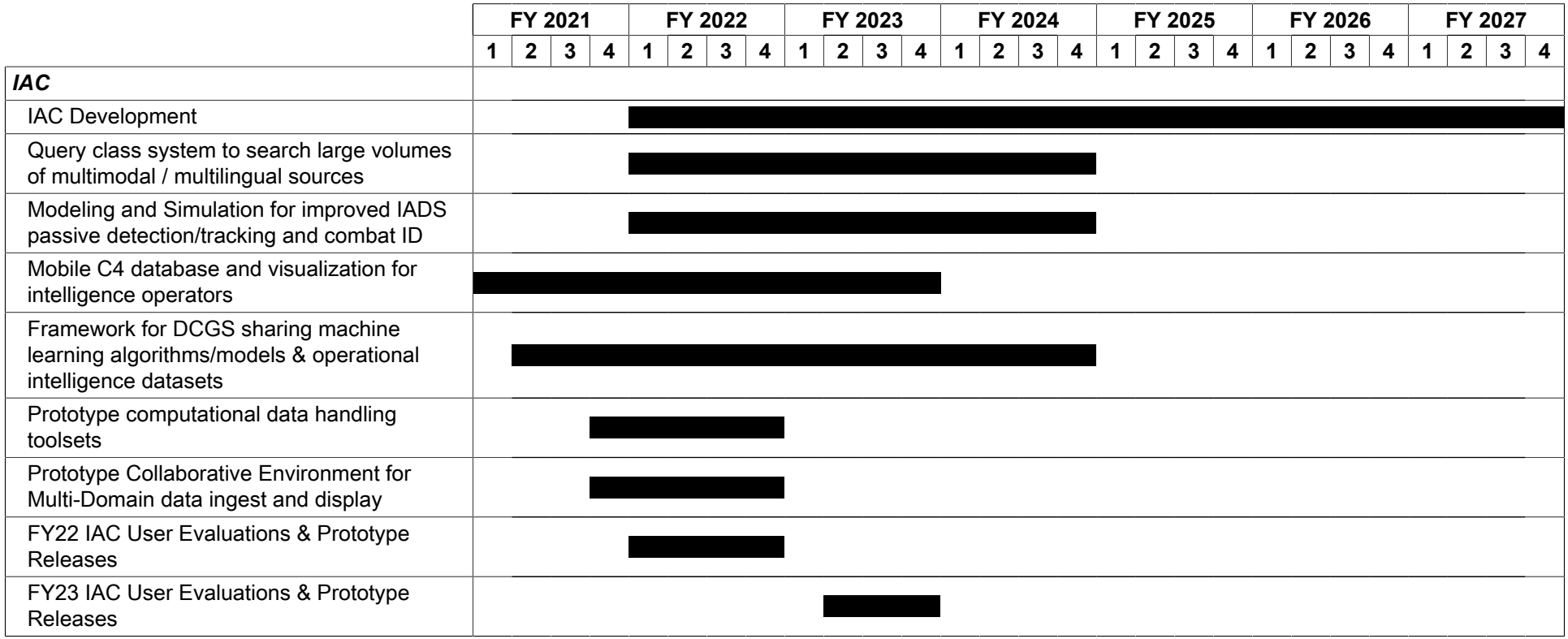

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603260F / *Intelligence Advanced Development*	**Project (Number/Name)** 64537A / *INTELLIGENCE ANALYSIS CAPABILITIES (IAC)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
IAC				
IAC Development	1	2022	4	2027
Query class system to search large volumes of multimodal / multilingual sources	1	2022	4	2024
Modeling and Simulation for improved IADS passive detection/tracking and combat ID	1	2022	4	2024
Mobile C4 database and visualization for intelligence operators	1	2021	4	2023
Framework for DCGS sharing machine learning algorithms/models & operational intelligence datasets	2	2021	4	2024
Prototype computational data handling toolsets	4	2021	4	2022
Prototype Collaborative Environment for Multi-Domain data ingest and display	4	2021	4	2022
FY22 IAC User Evaluations & Prototype Releases	1	2022	4	2022
FY23 IAC User Evaluations & Prototype Releases	2	2023	4	2023

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603742F / *Combat Identification Technology*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	25.824	21.939	17.318	0.000	17.318	24.119	24.611	25.092	25.651	Continuing	Continuing
642597: *Noncooperative Identification Subsystems*	-	13.544	19.283	15.174	0.000	15.174	21.392	21.790	22.251	22.746	Continuing	Continuing
642599: *Cooperative Identification Techniques*	-	6.080	0.000	0.070	0.000	0.070	0.076	0.119	0.083	0.085	Continuing	Continuing
643420: *Combat ID Database Development*	-	6.200	2.656	2.074	0.000	2.074	2.651	2.702	2.758	2.820	Continuing	Continuing

A. Mission Description and Budget Item Justification

Combat Identification is the process of determining the identity of an entity in the battlespace. It is essential to determine if that entity is a friend, neutral or enemy; and if an enemy, the nature of the entity determines how it should be engaged. The Combat Identification team's mission is to identify new and promising technology candidates, evaluate the usefulness of the technologies, conduct demonstrations in operationally relevant environments, and coordinate strategies that expedite transition to more than one platform. This Program Element aims to integrate and transition new capabilities into fielded systems, and improve existing capabilities. The mission area consists of three projects: non-cooperative Combat Identification, cooperative Combat Identification, and Combat Identification database development.

Non-cooperative Combat Identification techniques do not depend on a response from the targeted platform - such as high range resolution radar that measures the length of a target. Cooperative Combat Identification systems require communication between two participating platforms. Combat Identification database development matures techniques to ensure target representations in the database enable the algorithms to perform correctly. Both non-cooperative and cooperative Combat Identification techniques are currently in the field, and are necessary elements of the kill chain that ensure mission success and reduce fratricide.

Activities also include studies and analysis to support both current program planning and execution and future program planning.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Combat Identification technologies. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F.

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force					Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*		R-1 Program Element (Number/Name) PE 0603742F / *Combat Identification Technology*			
B. Program Change Summary ($ in Millions)	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**
Previous President's Budget	26.348	21.939	0.000	0.000	0.000
Current President's Budget	25.824	21.939	17.318	0.000	17.318
Total Adjustments	-0.524	0.000	17.318	0.000	17.318
• 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	-0.002	0.000			
• SBIR/STTR Transfer	-0.522	0.000			
• Other Adjustments	0.000	0.000	17.318	0.000	17.318

Change Summary Explanation

Decrease in FY 2021 reflects reprogramming to support Research and Development Projects, 10 U.S.C. Section 2363, an amendment to PL 110-417, 10 U.S.C. Section 2358 and 10 U.S.C. 2805(d)(1)(B).

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603742F / *Combat Identification Technology*	Project (Number/Name) 642597 / *Noncooperative Identification Subsystems*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
642597: *Noncooperative Identification Subsystems*	-	13.544	19.283	15.174	0.000	15.174	21.392	21.790	22.251	22.746	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Non-cooperative combat identification (CID) employs a number of sensing technologies and signal processing techniques designed to extract discriminating features from a battlespace entity (target). Specifically-designed algorithms compare those extracted features to a tailored database to identify those targets. These technologies include: (A) non-cooperative Air Target Identification (ATID) technologies, (B) non-cooperative Ground Target Identification (GTID) technologies, and (C) Studies and Analysis, evaluating potential new technologies.

Air Target Identification (ATID) technology developments currently focus on development and implementation of the Joint Multi-platform Advanced Combat identification (JMAC) architecture, which is a framework that allows multiple sensors to provide a robust combat identification solution; and efforts aimed at the discovery and generation of features from fielded sensors to supply data to Joint Multi-platform Advanced Combat identification. Joint Multi-platform Advanced Combat identification is evolving into the primary Department of Defense air target identification architecture.

Ground Target Identification (GTID) efforts are currently focused on transitioning a combat identification capability for denied access environments using passive radio frequency and electronic warfare information, integrating radio based technologies into the cockpit to increase confidence of target identification and situational awareness as well as reduce fratricides, and to demonstrate weapon-based combat identification back to the launch platform using a communication link from that launched weapon. Ground Target Identification is also developing technology to address efficiency and sustainability issues associated with the development, operation and maintenance of non-cooperative monostatic and bi-static synthetic aperture radar (SAR) aided target recognition (ATR) algorithms and databases.

Studies and Analysis discovers novel technologies that are ready to become transitionable projects, and includes Enhanced Combat ID (ECID), an activity to develop a robust ability to quantitatively evaluate promising combat identification technologies using enhanced modeling and simulation capabilities. The Studies and Analysis effort also performs early assessments of promising technologies through Concept Calls to determine if the program should incorporate them as a formal project within the combat identification portfolio.

Activities also include studies and analysis to support both current program planning and execution and future program planning.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Combat Identification technologies. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, and 0605898F.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*	**Project (Number/Name)** 642597 / *Noncooperative Identification Subsystems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Laser Vision	2.100	0.000	0.000
Description: The Vibrometry Advanced Mode Processor effort develops advanced algorithms for processing data provided by laser vibrometry sensors to demonstrate prototype pilot Aided Target Recognition software. This leverage ability of active electro-optic sensors to sense micro-displacements of operating machinery to measure the resulting frequency spectrum. The effort will assess utility for air-to-ground Combat Identification and will apply Aided Target algorithms to determine how well the technology can separate target classes. Laser Vision uses electro-optical systems to significantly increase target identification ranges. It provide the demonstration and evaluation data necessary to support decisions on future electro-optical technologies supporting combat identification, including 3-dimensional imaging, laser vibrometry and synthetic aperture ladar. - The 3-Dimensional Targeting Operations project provides 3-dimensional data to Aided Target Recognition algorithms for high confidence combat identification, and has high potential for the next generation of targeting pods for the Air Force. - The Vibration Advanced Mode Processor effort develops advanced algorithms for processing data provided by laser vibrometry sensors to demonstrate prototype Aided Target Recognition. This leverages the ability of active electro-optical sensors to sense micro-displacement of operating machinery to measure the resulting frequency spectrum. The effort will assess the utility for air-to-ground combat identification and will apply Aided Target Recognition algorithms to determine how well the technology can separate target classes. - The Multi-Mode Ladar Aided Target Recognition project combines 3-dimensional laser imaging with laser vibrometry and synthetic aperture ladar to create a longer-range fused-feature combat identification technique that uses the combined orthogonal features of each modality to provide a robust long-range combat identification capability. Per the direction of the Combat Identification Senior Advisory Group, Laser Vision activities were put into a hibernation state starting in FY 2022; Vibrometry Advanced Mode. Processor and 3-Dimensional Targeting Operations were completed as scheduled and are ready to transition CID capability to Litening. ***FY 2022 Plans:*** Effort was be completed in FY 2021, thus no additional funding is required. ***FY 2023 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*	**Project (Number/Name)** 642597 / *Noncooperative Identification Subsystems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Not applicable ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Not applicable			
Title: Hydra Vision/Air to Air ***Description:*** Hydra Vision Air-to-Air project discovers, matures and integrates features collected from any battlespace sensor into the Joint Multiplatform Advanced Combat identification (JMAC) air target CID architecture, and transitions the mode to tactical aircraft. ***FY 2022 Plans:*** Hydravision Air-to-Air will implement and demonstrate Joint Multi-platform Advanced Combat identification (JMAC) in an F-16 testbed aircraft. The project will also begin a demonstration project for inserting JMAC into an F-15. The Integrated Combat identification with Electronic warfare project will add electronic warfare features into the JMAC architecture for outyear maturation and demonstration." ***FY 2023 Plans:*** Starting in FY 2023, this work is performed under Project 642597, Noncooperative Identification Subsystems, Air Target Identification (ATID) effort. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 decreased compared to FY 2022 by $3.943 million. Justification for this decrease is due to realignment of funding to Project 642597, Noncooperative Identification Subsystems, Air Target Identification (ATID) effort.	2.778	3.943	0.000
Title: Compact Aided Target Recognition and Sustainable Environment (CASE) ***Description:*** Compact Aided Target Recognition and Sustainable Environment is a family of efforts to address efficiency and sustainability issues associated with the development, operation and maintenance of non-cooperative Aided Target Recognition technology. Develop sustainable multi-phenomenology Aided Target Recognition based on low fidelity, compact, and inexpensive database technology. ***FY 2022 Plans:*** This effort will investigate the viability of using machine learning algorithms to continue to provide Combat Identification ranges for ground targets, but less is needed. Conduct verification/validation and analysis of data collected during FY 2021. ***FY 2023 Plans:***	0.700	0.950	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*	**Project (Number/Name)** 642597 / *Noncooperative Identification Subsystems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Starting in FY 2023, this work is performed under Project 642597, Noncooperative Identification Subsystems, Ground Target Identification (GTID) effort. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 decreased compared to FY 2022 by $0.950 million. Justification for this decrease is due to realignment of funding to Project 642597, Noncooperative Identification Subsystems, Ground Target Identification (GTID) effort.			
Title: Passive Radio Frequency Identification Environment (PRIDE) ***Description:*** Develop passive Radio Frequency target Identification capability for denied access environment utilizing passive Radio Frequency and Electronic Warfare information with potential non-traditional Intelligence, Surveillance and Reconnaissance capabilities. ***FY 2022 Plans:*** This effort will develop an Identification capability useful in a denied access environment using passive Radio Frequency and Electronic Warfare (EW) information. Efforts require less for data collection activities in FY 2022. ***FY 2023 Plans:*** Starting in FY 2023, this work is performed under Project 642597, Noncooperative Identification Subsystems, Ground Target Identification (GTID) effort. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 decreased compared to FY 2022 by $4.123 million. Justification for this decrease is due to realignment of funding to Project 642597, Noncooperative Identification Subsystems, Ground Target Identification (GTID) effort.	2.281	4.123	0.000
Title: Radio ID (RID) ***Description:*** Radio Identification will develop technologies to integrate radio based cooperative technologies with non-cooperative technologies into the cockpit. The benefits will be increased confidence target identification and situational awareness as well as reduced fratricides. ***FY 2022 Plans:*** This effort will develop methods for using advances in software defined radios to provide enhanced Combat Identification solutions and improve aircrew situational awareness. Initial development will give way to a lab demonstration with smaller funding requirements. ***FY 2023 Plans:***	2.387	3.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*	**Project (Number/Name)** 642597 / *Noncooperative Identification Subsystems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Starting in FY 2023, this work is performed under Project 642597, Noncooperative Identification Subsystems, Ground Target Identification (GTID) effort. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 decreased compared to FY 2022 by $3.000 million. Justification for this decrease is due to realignment of funding to Project 642597, Noncooperative Identification Subsystems, Ground Target Identification (GTID) effort.			
Title: Studies ***Description:*** The studies effort serves to analyze Automatic Target Recognition algorithm performance and technology investment needs. Furthermore the studies effort covers low Technical Readiness Level (TRL 4) efforts which have been funded through the Combat Identification Concept Call. ***FY 2022 Plans:*** In FY 2022 efforts will continue modeling, simulation and analysis of Combat Identification technologies and also new Concept Call technology development. ***FY 2023 Plans:*** Continues to conduct Combat Identification related studies and demonstrations. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 decreased compared to FY 2022 by $2.363 million. Justification for this decrease is due to reduced emphasis on Concept Call efforts.	2.281	4.267	1.904
Title: Kill-chain Weapon Integrated CID (KWIC) ***Description:*** Kill-chain Weapons Integrated Combat Identification will use air to ground sensors to provide better situational awareness and Combat Identification of target area ***FY 2022 Plans:*** Continue with feature extraction and algorithm development. ***FY 2023 Plans:*** Starting in FY 2023, this work is performed under Project 642597, Noncooperative Identification Subsystems, Ground Target Identification (GTID) effort. ***FY 2022 to FY 2023 Increase/Decrease Statement:***	1.017	3.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*	**Project (Number/Name)** 642597 / *Noncooperative Identification Subsystems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY 2023 decreased compared to FY 2022 by $3.000 million. Justification for this decrease is due to realignment of funding to Project 642597, Noncooperative Identification Subsystems, Ground Target Identification (GTID) effort.			
Title: Air Target Identification (ATID) ***Description:*** The Air Target Identification project discovers, matures and integrates features collected from any battlespace sensor into the Joint Multiplatform Advanced Combat Identification (JMAC) air target data-fusion architecture, and transitions the mode to tactical aircraft. Air Target Identification efforts include: (1) Air-to-Air Hydra Vision (AAHV), developing methods to extract and exploit features from fielded sensors to provide data to Joint Multiplatform Advanced Combat Identification; (2) F-16 Joint Multiplatform Advanced Combat Identification Open Mission System (OMS) Rapid Development (FJORD), the effort to demonstrate Joint Multiplatform Advanced Combat Identification on the F-16; (3) F-15 Joint Multiplatform Advanced Combat Identification (JMAC-15), investigating transition of Joint Multiplatform Advanced Combat Identification into the F-15E/EX fleet; and (4) Integrated Combat identification and Electronic warfare (ICE), which incorporates features extracted from an electronic warfare suite to enhance the Joint Multiplatform Advanced Combat Identification solution. ***FY 2022 Plans:*** Not applicable ***FY 2023 Plans:*** Demonstrate feature extraction algorithms within the Joint Multiplatform Advanced Combat ID (JMAC) construct in concert with the Army Aviation and Missile Center (AvMC) and Missile Defense Agency (MDA) through F-16 testbed flights. Leverage Combat Identification sensor vendors to continue developing advanced data extraction algorithms. With sensor feature extraction algorithms maturing, the Joint Multiplatform Advanced Combat Identification - 15 (JMAC-15) effort will complete System Integration Laboratory tests of Joint Multiplatform Advanced Combat ID in FY 2023 to prepare for F-15 flight tests in FY 2024. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 increased compared to FY 2022 by $7.587 million. Justification for this increase is due to realignment of funding from Project 642597, Noncooperative Identification Subsystems, Hydra Vision / Air to Air effort.	-	0.000	7.587
Title: Ground Target Identification (GTID) ***Description:*** Ground Target Identification technologies consist of (1) Compact Aided target recognition (ATR) and Sustainable Environments (CASE), an approach that focuses on tailoring algorithms to use small, efficient databases that are relatively affordable to generate and maintain; (2) Passive Radio-frequency IDentification Environment (PRIDE), an effort to develop a bistatic synthetic aperture radar (SAR) automatic target recognition (ATR) capability useful in a denied access environment; (3) Radio Identification (RID), an effort to develop methods (including machine learning and artificial intelligence algorithms) paired with advances in software defined radios to provide ground emitter ID to improve aircrew situational awareness; and (4) Kill-chain	-	0.000	5.683

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*	**Project (Number/Name)** 642597 / *Noncooperative Identification Subsystems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Weapon Integrated CID (KWIC), an effort that will use information from launched weapons through a back channel communication link to provide CID from within the hot battlespace. ***FY 2022 Plans:*** Not applicable ***FY 2023 Plans:*** Focus tech development toward identification of targets in camouflage, concealment, denial and decoy conditions. This effort will look at sensor modes and sensor fusion to provide technical solutions to this critical challenge. Passive Radio Frequency Identification Environment will finish Phase 2 efforts with an offline demonstration in Phase 2 and will ramp up for Phase 3. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 increased compared to FY 2022 by $5.683 million. Justification for this increase is due to realignment of funding from Project 642597, Noncooperative Identification Subsystems, Compact Aided Target Recognition and Sustainable Environment (CASE) effort, Passive Radio Frequency Identification Environment (PRIDE) effort, Radio ID (RID) effort, and Kill-chain Weapon Integrated CID (KWIC) effort.			
Accomplishments/Planned Programs Subtotals	13.544	19.283	15.174

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Combat Identification develops technologies for exploitation by the United States Air Force and other services. Award multiple, competitive contract vehicles emphasizing off-the-shelf technology and maximizing the use of non-developmental items (NDIs). Management develops a technology to a point it can be demonstrated in a relevant combat environment.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*	**Project (Number/Name)** 642597 / *Noncooperative Identification Subsystems*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hydra Vision (Air-to-Air) - L	C/CPFF	Leidos : Dayton, OH	-	1.000	Jan 2021	0.603	Jan 2022	-		-		-	Continuing	Continuing	-
Hydra Vision (Air-to-Air) - T	C/CPAF	TBD : TBD	-	-		1.370	Feb 2022	-		-		-	Continuing	Continuing	-
Air Target ID	C/CPAF	TBD : TBD	-	-		-		3.063	Feb 2023	-		3.063	Continuing	Continuing	-
Target Recognition & Tracking Technology	MIPR	Sandia : Albuquerque, NM	-	0.600	Feb 2021	0.400	Oct 2021	-		-		-	Continuing	Continuing	-
CASE - Compact AiTR and Sustainable Environment Analysis - L	C/CPFF	Leidos : Dayton, OH	-	1.084	Jan 2021	0.500	Jan 2022	-		-		-	Continuing	Continuing	-
Passive Radar Identification Environment (PRIDE) - L	C/CPFF	Leidos : Mclean, VA	-	1.000	Oct 2020	2.700	Oct 2021	-		-		-	Continuing	Continuing	-
GTID - Passive Radar Identification Environment (PRIDE) - L	C/CPAF	Leidos : McLean, VA	-	-		-		0.803	Oct 2022	-		0.803	Continuing	Continuing	-
Radio Identification (RID) L	MIPR	DMEA : Sacramento, CA	-	0.500	Feb 2021	2.100	Feb 2022	-		-		-	Continuing	Continuing	-
GTID - Radio Identification (RID) L	MIPR	DMEA : Sacramento, CA	-	-		-		0.742	Feb 2023	-		0.742	Continuing	Continuing	-
Radio Identification (RID) NG	MIPR	DMEA : Sacramento, CA	-	0.919	Mar 2021	0.900	Feb 2022	-		-		-	Continuing	Continuing	-
GTID - Radio Identification (RID) NG	MIPR	DMEA : Sacramento, CA	-	-		-		0.500	Feb 2023	-		0.500	Continuing	Continuing	-
M2LATR	C/CPFF	TBD : TBD	-	0.500	Mar 2021	0.581	Apr 2022	-		-		-	Continuing	Continuing	-
VAMP	C/CPAF	Northrop Grumman : Rolling Meadows, IL	-	0.350	Jan 2021	-		-		-		-	Continuing	Continuing	-
Infoscitex	C/CPAF	Infoscitex : Dayton, OH	-	0.000	Mar 2021	0.130	Mar 2022	-		-		-	Continuing	Continuing	-
PRECISE-N	C/CPAF	Northrop Grumman : Baltimore, MD	-	0.500	Jan 2021	1.015	Dec 2021	-		-		-	Continuing	Continuing	-
PRECISE-R	C/CPAF	Raytheon : El Segundo, CA	-	1.000	Jan 2021	0.981	Dec 2021	-		-		-	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603742F / *Combat Identification Technology*	Project (Number/Name) 642597 / *Noncooperative Identification Subsystems*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PRECISE-M	C/CPAF	Matrix : Beavercreek, OH	-	0.980	Mar 2021	0.750	Jan 2022	-		-		-	Continuing	Continuing	-
CAST	MIPR	DMEA : Sacramento, CA	-	0.300	Jan 2021	0.200	Jan 2022	-		-		-	Continuing	Continuing	-
Concept Call #1	C/CPAF	TBD : TBD	-	0.400	May 2021	0.200	May 2022	-		-		-	Continuing	Continuing	-
Concept Call #2	MIPR	SANDIA : Albuquerque, NM	-	0.250	May 2021	0.450	May 2022	-		-		-	Continuing	Continuing	-
Studies - Concept Call #2	MIPR	SANDIA : Albuquerque, NM	-	-		-		0.200	May 2023	-		0.200	Continuing	Continuing	-
Concept Call #3	C/CPAF	Not specified. : TBD	-	0.100	May 2021	0.100	May 2022	-		-		-	Continuing	Continuing	-
Concept Call #4	C/CPAF	TBD : TBD	-	-		-		-		-		-	Continuing	Continuing	-
Studies - Concept Call # 4	C/CPAF	TBD : TBD	-	-		-		0.771	May 2023	-		0.771	Continuing	Continuing	-
Concept Call #5	C/CPAF	TBD : TBD	-	-		-		0.000	May 2023	-		0.000	Continuing	Continuing	-
Integrated CID and EW GTRI	C/CPAF	GTRI : Dayton, OH	-	0.400	Jan 2021	0.800	Jan 2022	-		-		-	Continuing	Continuing	-
ATID - Integrated CID and EW GTRI	C/CPAF	GTRI : Dayton, OH	-	-		-		0.800	Jan 2023	-		0.800	Continuing	Continuing	-
Integrated CID and EW NG	C/CPAF	Northrop Grumman : Baltimore, MD	-	0.500	Jan 2021	0.700	Jan 2022	-		-		-	Continuing	Continuing	-
ATID - Integrated CID and EW NG	C/CPAF	Northrop Grumman : Baltimore, MD	-	-		-		1.000	Jan 2023	-		1.000	Continuing	Continuing	-
Integrated CID and EW RTX	C/CPAF	Raytheon : El Segundo, CA	-	-		-		-		-		-	Continuing	Continuing	-
ATID - Integrated CID and EW RTX	C/CPAF	Raytheon : El Segundo, CA	-	-		-		0.284	Jan 2023	-		0.284	Continuing	Continuing	-
Kill Chain Weapons Integrated CID	C/CPAF	Raytheon : El Segundo, CA	-	0.500	Jan 2021	1.500	Jan 2022	-		-		-	Continuing	Continuing	-
ATID - Kill Chain Weapons Integrated CID	C/CPAF	Raytheon : El Segundo, CA	-	-		-		0.500	Jan 2023	-		0.500	Continuing	Continuing	-
AFSIM Development	C/CPAF	TBD : TBD	-	0.300	Feb 2021	0.200	Feb 2022	-		-		-	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603742F / *Combat Identification Technology*	Project (Number/Name) 642597 / *Noncooperative Identification Subsystems*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ATID - AFSIM Development	C/CPAF	TBD : TBD	-	-		-		0.200	Feb 2023	-		0.200	Continuing	Continuing	-
JMAC Integration	C/CPAF	TBD : TBD	-	0.159	Feb 2021	-		-		-		-	Continuing	Continuing	-
ATID - JMAC Integration	C/CPAF	TBD : TBD	-	-		-		0.600	Nov 2022	-		0.600	Continuing	Continuing	-
XPatch Upgrades	C/CPAF	Leidos : Mclean, VA	-	0.250	Aug 2021	-		-		-		-	Continuing	Continuing	-
Ground Target ID	C/CPAF	TBD : TBD	-	-		-		2.100	Jan 2023	-		2.100	Continuing	Continuing	-
		Subtotal	-	11.592		16.180		11.563		-		11.563	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Studies - Systems Engineering Support	C/CPAF	TBD : TBD	-	0.000		-		0.900	Dec 2022	-		0.900	Continuing	Continuing	-
ECID MS&A	C/CPAF	TBD : TBD	-	0.600	Dec 2020	-		-		-		-	Continuing	Continuing	-
Studies - ECID MS&A	C/CPAF	TBD : TBD	-	-		-		0.700	Dec 2022	-		0.700	Continuing	Continuing	-
		Subtotal	-	0.600		-		1.600		-		1.600	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	PO	704TSS : Holloman, NM	-	-		-		-		-		-	Continuing	Continuing	-
Data Collection-AvMC	MIPR	AvMC : Huntsville, AL	-	0.754	Feb 2021	-		-		-		-	Continuing	Continuing	-
Data Collection-Eglin	PO	96th Test Wing : Eglin AFB, FL	-	-		-		-		-		-	Continuing	Continuing	-
Data Collection-Yuma	MIPR	Yuma Proving Ground : Yuma, AZ	-	0.245	Feb 2021	-		-		-		-	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*	**Project (Number/Name)** 642597 / *Noncooperative Identification Subsystems*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Data Collection-NNSS	MIPR	NNSS : NNSS, NE	-	0.090	Feb 2021	-		-		-		-	Continuing	Continuing	-
Data Collection	MIPR	TBD : TBD	-	-		1.000	Feb 2022	-		-		-	Continuing	Continuing	-
		Subtotal	-	1.089		1.000		-		-		-	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AFRL PMA	Various	Various : Various, OH	-	0.263	Mar 2021	2.103	May 2022	2.011	May 2023	-		2.011	Continuing	Continuing	-
		Subtotal	-	0.263		2.103		2.011		-		2.011	Continuing	Continuing	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	13.544		19.283		15.174		-		15.174	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*	**Project (Number/Name)** 642597 / *Noncooperative Identification Subsystems*

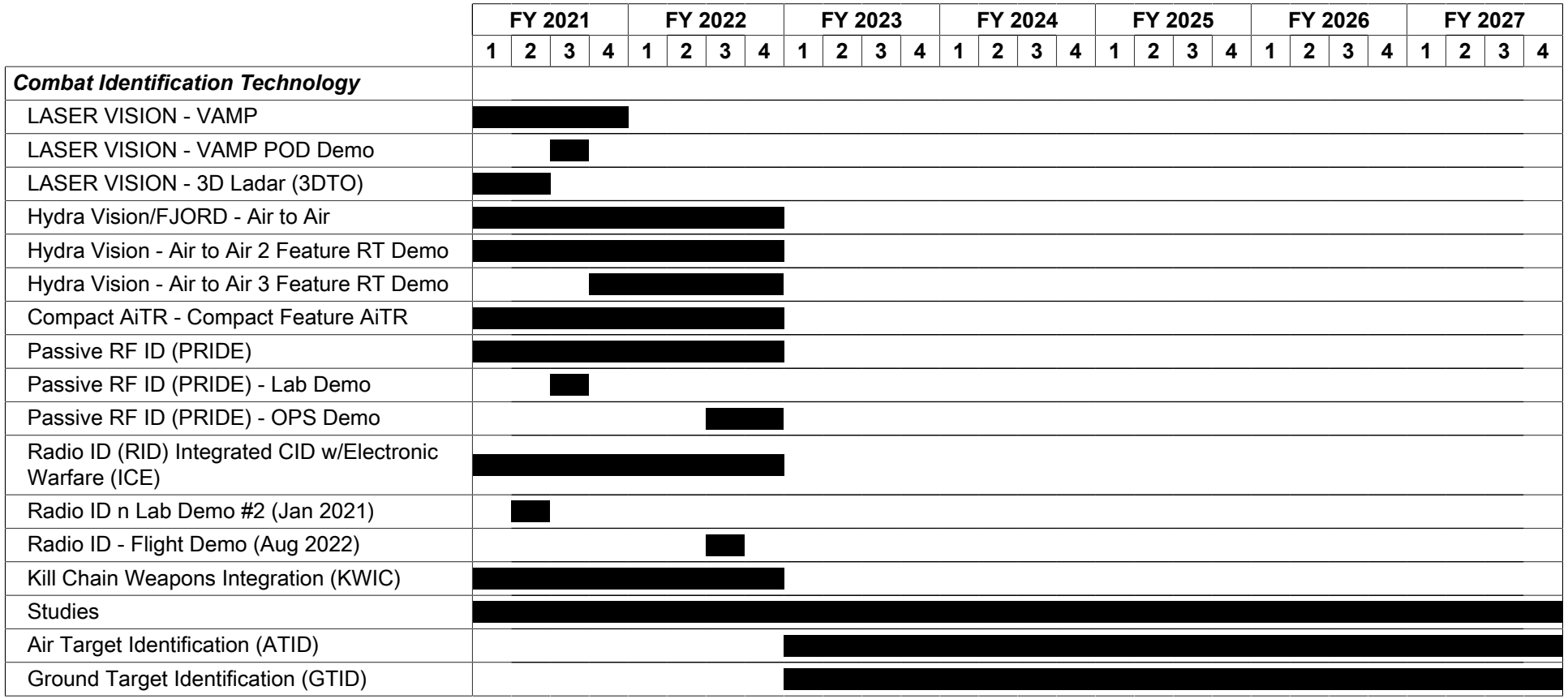

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*	**Project (Number/Name)** 642597 / *Noncooperative Identification Subsystems*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Combat Identification Technology				
LASER VISION - VAMP	1	2021	4	2021
LASER VISION - VAMP POD Demo	3	2021	3	2021
LASER VISION - 3D Ladar (3DTO)	1	2021	2	2021
Hydra Vision/FJORD - Air to Air	1	2021	4	2022
Hydra Vision - Air to Air 2 Feature RT Demo	1	2021	4	2022
Hydra Vision - Air to Air 3 Feature RT Demo	4	2021	4	2022
Compact AiTR - Compact Feature AiTR	1	2021	4	2022
Passive RF ID (PRIDE)	1	2021	4	2022
Passive RF ID (PRIDE) - Lab Demo	3	2021	3	2021
Passive RF ID (PRIDE) - OPS Demo	3	2022	4	2022
Radio ID (RID) Integrated CID w/Electronic Warfare (ICE)	1	2021	4	2022
Radio ID n Lab Demo #2 (Jan 2021)	2	2021	2	2021
Radio ID - Flight Demo (Aug 2022)	3	2022	3	2022
Kill Chain Weapons Integration (KWIC)	1	2021	4	2022
Studies	1	2021	4	2027
Air Target Identification (ATID)	1	2023	4	2027
Ground Target Identification (GTID)	1	2023	4	2027

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603742F / *Combat Identification Technology*	Project (Number/Name) 642599 / *Cooperative Identification Techniques*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
642599: *Cooperative Identification Techniques*	-	6.080	0.000	0.070	0.000	0.070	0.076	0.119	0.083	0.085	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Cooperative Combat Identification employs technologies required to rapidly identify friendly platforms. The program develops, integrates and evaluates technologies that provide Air Force platforms with a means of positively identifying an air or ground platform as a friendly, via active or passive cooperative identification capabilities. The development funded by this project ensures availability of a Mode 5 upgrade path for implementing ground and air platforms across the Air Force fleet. The Department of Defense International AIMSPO has system level interoperability testing and certification responsibilities for the present Mark XIIB system, development and integration of new Identification Friend or Foe (IFF) system capabilities, and development/integration of civil Mode S capabilities into Mark XIIB Identification Friend or Foe equipment. The AIMSPO ensures Identification Friend or Foe equipment/platform functionality in accordance with established standards and ensures total system interoperability to meet Department of Defense/Service mission areas (e.g. Offensive Counter Air, Defensive Counter Air, and Integrated Air and Missile Defense).

The cooperative goals will be to test and certify the Mark XIIB system, develop and integrate the new Mark XIIB Identification Friend or Foe system capability (Mode 5 Level 2 Broadcast) and also continue the development/integration of civil Mode S capabilities into Mark XIIB Identification Friend or Foe equipment using newly fielded M-code GPS receivers.. The cooperative funds will be used to fund projects and personnel who develop and test technical standards, perform certification testing, process certifications and track all Office of the Secretary of Defense and Federal Aviation Administration guidelines to ensure the program remains current. The Office of the Secretary of Defense and Federal Aviation Administration guidelines required Mode 5 be fully implemented by FY 2020 but many platforms continue to integrate this capability. The Department of Defense AIMS Program will ensure those certifications are current on all applicable platforms/systems and work with both domestic and foreign military sales partners to ensure compliance. The funds also support Department of Defense representation to several military (United States and NATO) and civil (Federal Aviation Administration, International Civil Aviation Organization and Radio Technical Commission for Aeronautics) requirements meetings for Mode 5, Mode S and ADS-B. These important meetings allow the Department of Defense to remain interoperable with our foreign military partners as well as the United States. and international civil aviation community. Department of Defense AIMS Program will continue to update the Department of Defense AIMS Mark XIIB Standards, Security Classification Guide, Handbook, and Test Requirements.

Cooperative activities include performing studies to evaluate weakness in the Mode 5 Identification Friend or Foe system, and to identify potential paths forward for a new system.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Air Traffic Control and Radar Beacon Systems Identification Friend or Foe Mark XIIA System (AIMS) Program Office	6.080	0.000	0.000
Description: Develop and maintain technical standards on development, integration, testing, and certification of Department of Defense Identification Friend or Foe equipment. Coordinate and execute equipment/subsystem-level certifications and platform			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*	**Project (Number/Name)** 642599 / *Cooperative Identification Techniques*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
certifications of Identification Friend or Foe capabilities (298 Mode 5 certifications were completed in FY20). Support Foreign Military Sales of the United States Identification Friend and Foe equipment. Currently managing 49 active Foreign Military Sales Cases. Support NATO Identification Friend or Foe Capabilities Team (Mode 5 Identification Friend or Foe is a NATO waveform). Support International Civil Aviation Organization (ICAO) Technical Support Group (develops standards for world-wide civil Air Traffic Control). Create and maintain civil Mode S address assignments and military Mode 5 Platform Identification Number assignments for every Department of Defense platform using these waveforms in their interrogator and/or transponder equipment. ***FY 2022 Plans:*** In FY 2022, this work will be performed under PE 0207420F Combat Identification. ***FY 2023 Plans:*** Not applicable			
Title: Cooperative Follow-on System ***Description:*** Perform studies to evaluate weakness in the Mode 5 Identification Friend or Foe system, and to identify potential paths forward for a new system. ***FY 2022 Plans:*** Not applicable ***FY 2023 Plans:*** Perform studies to evaluate weakness in the Mode 5 Identification Friend or Foe system, and to identify potential paths forward for the next generation cooperative Identification Friend or Foe system. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 increased by $0.070 million compared to FY 2022. Justification for this increase is described in plans above.	-	0.000	0.070
Accomplishments/Planned Programs Subtotals	6.080	0.000	0.070

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Combat Identification develops technologies for exploitation by the United States Air Force and the other services. Award multiple, competitive contract vehicles emphasizing off-the-shelf technology and maximizing the use of non-developmental items (NDIs). Management develops a technology to a point it can be demonstrated in a relative combat environment.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603742F / *Combat Identification Technology*	Project (Number/Name) 642599 / *Cooperative Identification Techniques*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering / Program Management - AIMS Program Office	MIPR	DTIC : Robins AFB, GA	-	5.894	Apr 2021	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	5.894		-		-		-		-	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Office Support	Various	Various : Various	-	0.186	Sep 2021	-		0.070	Sep 2023	-		0.070	Continuing	Continuing	-
Program Office Support - DOD AIMS Process System (DAPS) data base	MIPR	78ABW : Robins AFB, GA	-	-		-		-		-		-	Continuing	Continuing	-
		Subtotal	-	0.186		-		0.070		-		0.070	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	6.080		-		0.070		-		0.070	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*	**Project (Number/Name)** 642599 / *Cooperative Identification Techniques*

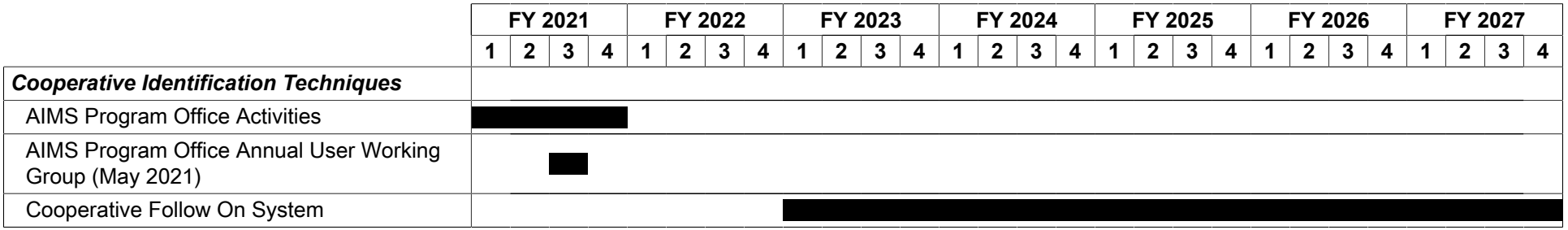

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*	**Project (Number/Name)** 642599 / *Cooperative Identification Techniques*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Cooperative Identification Techniques				
AIMS Program Office Activities	1	2021	4	2021
AIMS Program Office Annual User Working Group (May 2021)	3	2021	3	2021
Cooperative Follow On System	1	2023	4	2027

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603742F / *Combat Identification Technology*	Project (Number/Name) 643420 / *Combat ID Database Development*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
643420: *Combat ID Database Development*	-	6.200	2.656	2.074	0.000	2.074	2.651	2.702	2.758	2.820	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Database Initiative (DBI) is a project designed to remove the "hard-coded" static identification (ID) parameters (typically updated every 4-5 years) from the host platform's sensor(s) and replace them with parameterized values that are easily and quickly updated when new intelligence inputs come available (this allows maximum flexibility to tailor each aircraft's Combat Identification database(s) based on assigned theater of operation, threat country of interest, and assigned mission tasks). This project primarily consists of four objectives: A.) determining a sensor's requisite identification parameters for combat identification, B) designing and developing a database to contain the combat identification parameters identified in Objective A, C) developing techniques to generate the requisite parameters, and D) provide combat identification parameters developed from measured or modeled data.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Combat Identification technologies. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F.

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. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Database Development	6.200	2.656	2.074
Description: Develop techniques to remove the "hard-coded" static ID parameters from the host platform's sensor and replace them with parameterized values that are dynamic. ***FY 2022 Plans:*** Continue to collect data to populate the high range resolution radar (HHR) and non-cooperative target recognition (NCTR) databases for developmental test/debug. Develop techniques to remove the "hard-coded" static ID parameters from the host platform's sensor and replace them with parameterized values for Joint Multi-sensor Advanced Combat Identification (JMAC) architecture. ***FY 2023 Plans:*** Continue to collect data to populate the databases for developmental test/debug. Continue to develop techniques to remove the "hard-coded" static ID parameters from the host platform's sensor and replace them with parameterized values for Joint Multi-			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*	**Project (Number/Name)** 643420 / *Combat ID Database Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
sensor Advanced Combat Identification (JMAC) architecture. Add a new feature into the Joint Multi-sensor Advanced Combat Identification architecture. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 decreased compared to FY 2022 by $0.582 million. Justification for this decrease is described in plans above.			
Accomplishments/Planned Programs Subtotals	6.200	2.656	2.074

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Combat Identification develops technologies for exploitation by the USAF and the other services. Award multiple, competitive contract vehicles emphasizing off-the-shelf technology and maximizing the use of non-developmental items (NDIs). Management develops a technology to a point it can be demonstrated in a relative combat environment.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*	**Project (Number/Name)** 643420 / *Combat ID Database Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Database Development	MIPR	NASIC : WPAFB, OH	-	6.200	Feb 2021	2.656		2.074		-		2.074	Continuing	Continuing	-
		Subtotal	-	6.200		2.656		2.074		-		2.074	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	6.200		2.656		2.074		-		2.074	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*	**Project (Number/Name)** 643420 / *Combat ID Database Development*

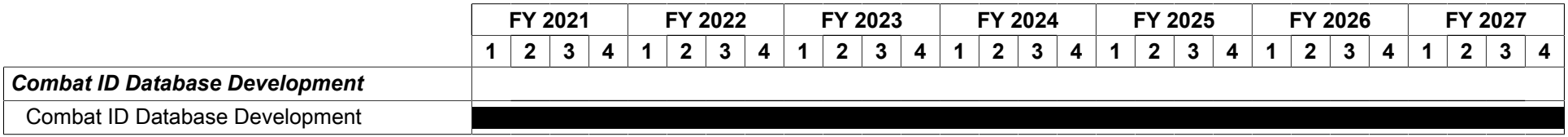

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603742F / *Combat Identification Technology*	**Project (Number/Name)** 643420 / *Combat ID Database Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Combat ID Database Development				
Combat ID Database Development	1	2021	4	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603790F / *NATO Research and Development*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	3.506	4.114	4.295	0.000	4.295	4.383	4.464	4.558	4.660	0.000	29.980
64NATO: *Nato Coop R&D*	-	3.506	4.114	4.295	0.000	4.295	4.383	4.464	4.558	4.660	0.000	29.980
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2016, PE 0603791F, International Space Cooperative Research & Development, Project 645035, International Space Coop R&D, efforts were transferred to PE 0603790F, NATO Research and Development, Project 64NATO, NATO Coop R&D, in order to consolidate international cooperative research and development activities. FY 2024-2027 FYDP budget dollars have not been loaded into IDECS.

A. Mission Description and Budget Item Justification

These funds will be used to initiate air, space, and cyber international cooperative research, and development (ICR&D) agreements with North Atlantic Treaty Organization (NATO) member states, major non-NATO allies and friendly foreign countries. Each of the selected activities and projects are required to have a concluded international agreement (IA), prior to funds being released, that implements the provisions of Title 10 U.S. Code, Section 2350a. This legislation (Title 10 U.S. Code, Section 2350) authorizes funds to significantly improve U.S. and allied conventional defense capabilities by leveraging the best defense technologies, eliminating costly duplication of R&D efforts, accelerating the availability of defense systems, and promoting US and allied interoperability or commonality. These funds will not be used for government civilian salaries, permanent construction, or spent overseas. This program element funds the implementation of Air Force ICR&D agreements in (1) Basic Research (2) Applied Research (3) Advanced Technology Development (4) Advanced Component Development and Prototypes (5) System Development and Demonstration and (6) RDT&E Management Support.

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603790F / *NATO Research and Development*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	3.640	4.114	0.000	0.000	0.000
Current President's Budget	3.506	4.114	4.295	0.000	4.295
Total Adjustments	-0.134	0.000	4.295	0.000	4.295
• 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	-0.134	0.000			
• Other Adjustments	0.000	0.000	4.295	0.000	4.295

Change Summary Explanation

FY22 funds decreased by .027M to support other Air Force Requirments.

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: International Cooperative Research and Development	3.506	4.114	4.295
Description: Supports bi- and multi-lateral international agreements that meet USAF RDT&E objectives and goals. Each of the cooperative projects that receive funding must meet one or more of the following requirements: enhance warfighter capabilities and coalition interoperability; accelerate the availability of defense systems; strengthen and reinforce strategic partnerships; gain access to the best defense technologies, capabilities and techniques; build relationships and influence with allies; and/or eliminate duplication of R&D efforts. ***FY 2022 Plans:*** FY22 cooperative projects involve RDT&E efforts in Artificial Intelligence, directed energy, hypersonics, Autonomy, human performance, information systems, aerospace systems, munitions, materials and manufacturing, sensors, local area airbase / airfield defense, machine learning, space situational awareness, missile warning, military satellite communications, global positioning systems, responsive space capabilities, cyber network defense, sensors,information assurance, and space vehicles. These projects include but are not limited to: Joint Advanced Laser Integration (JAVALIN), Confined Quantum Sensors, Military Applications of Laser Produced Particle Beams, Solid State High Power Microwave "Cannon", DEAD AIM, Advanced Electro-Optic Modulators for Enhancing RF Photonic Systems, Intelligent Adaptive Collaborative Teaming Technologies (iACTT),			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603790F / *NATO Research and Development*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Hyperspectral Detection / ID with EO / IR Fusion (HyDEF), Quick Reaction Laser Assessment Sensor, Advanced Data Analytics for C4ISR, MADCAP, Ranging of GEO Uncooperative Entities (RoGUE), Improved HPEM Elements for Next Generation, RF-Directed Energy Weapons, AI Based ISR for Contested and Diverse Environments, Autonomous Drone Swarm for Airfield and Runway Inspection, Operational Research Collaboration for Human Improvement in Defense (ORCHID), Multimodal Open Source Analytic Insights for C4ISR (MOSAIC), Dynamic Material Analysis Fatigue Life, Sustainment and Augmentation of the Military Enterprise through Synthetic Biology Engineering, Corrosion: Modeling and Accelerated Testing, and Damaged Composite Airframe Management Tools. International Cooperation are with but not limited to the following partners: Australia, Canada, Estonia, France, Germany, India, Italy, Israel, Japan, Netherlands, Norway, Republic of Korea, Singapore, Sweden, Switzerland, and United Kingdom. None / N/A ***FY 2023 Plans:*** FY23 cooperative projects involve RDT&E efforts in Artificial Intelligence, directed energy, hypersonics, Autonomy, human performance, information systems, aerospace systems, munitions, materials and manufacturing, sensors, local area airbase / airfield defense, machine learning, space situational awareness, missile warning, military satellite communications, global positioning systems, responsive space capabilities, cyber network defense, sensors ,information assurance, and space vehicles. These projects include but are not limited to: High Power Electromagnetics Advanced Weapon non-Kinetic Initiative, Gyromagnetic NLTL Arctic Systems (GNATS); Disturbed Ionospheres; High Atmospheric Eye Safe Laser (HAESL); Critical Infrastructure Resiliency and Prediction (CIRCAT); Dynamic Material Analysis Fatigue Life; Quantum, Photonic, & Electromagnetic Enabling Technology (QPEET), "Near-Ground-Turbulence Impact Study", Corrosion Modelling and Accelerated Testing, Phased-Array HPM System, Functional Probiotic to Improve Warfighter Performance During, Deployment Stress, Material Advances in Human wearables for physiological Sensing and Augmentation Military applications of laser produced particle beams, Risk Reduction for Flown Full Scale Composite Component Testing, Pilot Performance and Exposure Tracking, Nanomaterial Sensors, Protected Tactical Services (PTS), Wideband Global SATCOM, Low Earth Orbit Space Domain Awareness, and Deep Space Radar. Bilateral and Multilateral cooperative efforts are with the following countries: Australia, Austria, Estonia, Latvia, Lithuania, Belgium, Netherlands, Italy, Israel, India, France, Germany, Sweden, Finland, Norway, Luxembourg, Switzerland, Japan, Republic of Korea, Singapore, New Zealand, Canada, and Chile. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The FY23 NATO Coop R&D Program continues to experience 30% customer demand increase from FY22, but only a depicts a tepid inflationary elevation. Program viability and strategic importance requests future budgets reflect the customer demand.			
Accomplishments/Planned Programs Subtotals	3.506	4.114	4.295

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603790F / *NATO Research and Development*

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

A principal goal of the NATO Cooperative R&D program is to effectively utilize the aggregate resources invested by the US and our allies in air, space, and cyber R&D. This program element provides the critical funding incentive needed to pursue air, space and cyber related International Cooperative Research Development and Acquisition (ICRD&A) agreements and helps to (a) leverage USAF and allied resources through cost sharing and economies of scale; (b) exploit the best US and allied technologies for equipping coalition forces; (c) demonstrate areas of commonality or interoperability with our allies; and (d) accelerate the availability of defense technology and systems. Candidate projects are reviewed against USAF goals, DoD objectives, and warfighter needs prior to being approved. An international agreement defining project objectives, responsibilities and costs is required prior to release of funds. To obtain these funds and ensure service commitment, projects are selected from existing or new RDT&E programs funded in the Future Years Defense Plan (FYDP). Project offices must show matching funds and contributions from associated program elements and equitable allied funding. As appropriate, funding responsibility for out-year requirements and follow-on efforts are transferred to the project office and associated program elements. Any new contracts are awarded after full and open competition.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603790F / *NATO Research and Development*	Project (Number/Name) 64NATO / *Nato Coop R&D*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NATO Coop R&D (International Research Projects)	Various	Various : NV	-	2.048	Feb 2021	2.873	Feb 2022	2.905	Feb 2023	-		2.905	Continuing	Continuing	-
		Subtotal	-	2.048		2.873		2.905		-		2.905	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NATO Coop R&D (International Research Projects)	Various	Various : NV	-	1.458	Feb 2021	1.241	Feb 2022	1.390	Feb 2023	-		1.390	Continuing	Continuing	-
		Subtotal	-	1.458		1.241		1.390		-		1.390	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	3.506		4.114		4.295		-		4.295	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603790F / *NATO Research and Development*	**Project (Number/Name)** 64NATO / *Nato Coop R&D*

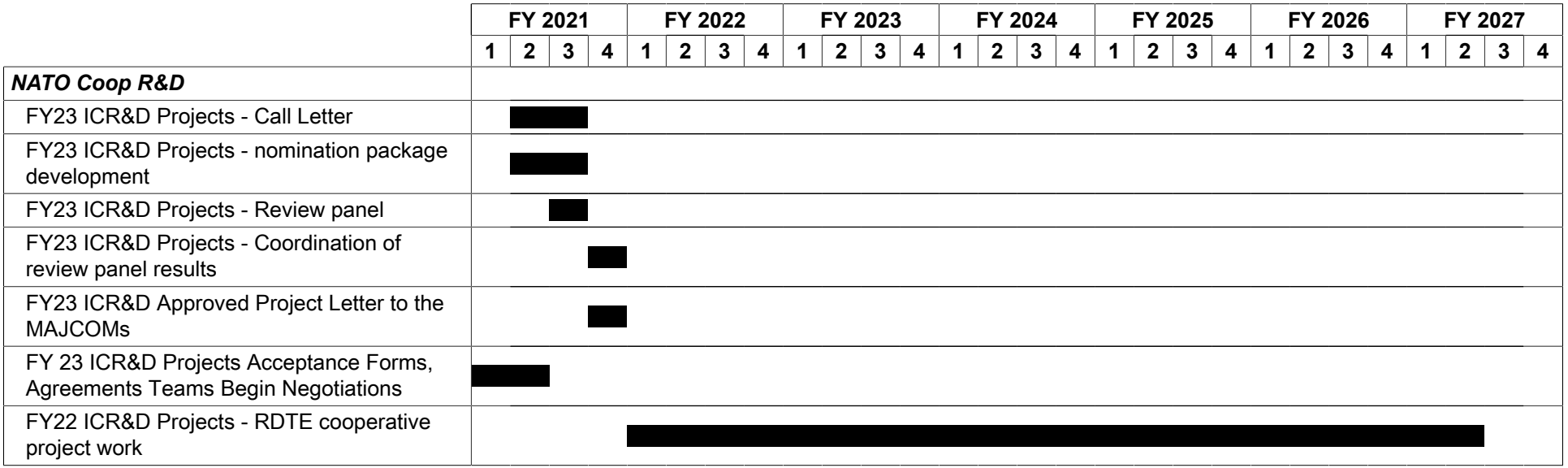

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603790F / *NATO Research and Development*	**Project (Number/Name)** 64NATO / *Nato Coop R&D*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
NATO Coop R&D				
FY23 ICR&D Projects - Call Letter	2	2021	3	2021
FY23 ICR&D Projects - nomination package development	2	2021	3	2021
FY23 ICR&D Projects - Review panel	3	2021	3	2021
FY23 ICR&D Projects - Coordination of review panel results	4	2021	4	2021
FY23 ICR&D Approved Project Letter to the MAJCOMs	4	2021	4	2021
FY 23 ICR&D Projects Acceptance Forms, Agreements Teams Begin Negotiations	1	2021	2	2021
FY22 ICR&D Projects - RDTE cooperative project work	1	2022	2	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603851F / *Intercontinental Ballistic Missile - Dem/Val*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	34.755	76.621	46.432	0.000	46.432	16.717	28.424	7.821	7.995	Continuing	Continuing
641020: *ICBM Guidance Applications*	-	18.875	8.022	4.137	0.000	4.137	0.000	0.000	0.000	0.000	Continuing	Continuing
641021: *ICBM Propulsion Applications*	-	5.262	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
641022: *ICBM Reentry Vehicle Applications*	-	10.456	45.166	13.042	0.000	13.042	0.000	0.000	0.000	0.000	Continuing	Continuing
644209: *Long Range Planning (LRP)*	-	0.162	23.433	29.253	0.000	29.253	16.717	28.424	7.821	7.995	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Intercontinental Ballistic Missile (ICBM) Demonstration/Validation (Dem/Val) program ensures a responsive design and development engineering infrastructure to address emerging issues and technology insertion/technology application on legacy and future ICBM, and other common strategic deterrent mission areas to develop enhanced multi-use capabilities. The ICBM Dem/Val program will provide technology maturation and risk reduction activities to support Minuteman (MM) III sustainment, MM III to Ground Based Strategic Deterrent (GBSD) transition, and future ICBM systems development. ICBM Dem/Val conducts advanced component development and prototyping to validate emerging strategic missile technologies and future upgrades to the ICBM. Efforts will identify methods to improve system performance, develop potential future Reentry Vehicle (RV) designs, mitigate evolving threats, reduce life cycle costs, develop/expand modeling/simulation and experimental platforms for weapon qualification activities, improve nuclear safety and surety, and ensure both viability and durability of strategic missile systems.

The ICBM Dem/Val program will develop key enabling engineering tools for the ICBM mission to include Models Based Systems Engineering (MBSE), test software, and modernization of existing analytical tools. This program will leverage modular system, open architecture and agile software development to build key enabling engineering tools and future upgrades to ICBMs.

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 0605831F or 0605833F. In FY 2021 0.000M was expended for civilian pay expenses in this program element, and in FY 2022 0.000M is forecasted for civilian pay expenses in this program element.

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force					Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*			R-1 Program Element (Number/Name) PE 0603851F / *Intercontinental Ballistic Missile - Dem/Val*		
B. Program Change Summary ($ in Millions)	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**
Previous President's Budget	32.899	49.621	0.000	0.000	0.000
Current President's Budget	34.755	76.621	46.432	0.000	46.432
Total Adjustments	1.856	27.000	46.432	0.000	46.432
• 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	3.000	0.000			
• SBIR/STTR Transfer	-1.144	0.000			
• Other Adjustments	0.000	27.000	46.432	0.000	46.432

Change Summary Explanation

FY2021 funding reflects a Small Business Innovation Research (SBIR) adjustment of $1.144M and a incoming below-threshold reprograming of $3M.
FY2022 funding reflects Congressional increase of $27M for ICBM mission enhancements developed under AFGSC's Innovation Hub to meet national strategic and operational needs.
The FY2022 President's Budget did not reflect the FY2023 through FY2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603851F / *Intercontinental Ballistic Missile - Dem/Val*	Project (Number/Name) 641020 / *ICBM Guidance Applications*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
641020: *ICBM Guidance Applications*	-	18.875	8.022	4.137	0.000	4.137	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Guidance Applications Program (GAP) ensures the development of strategic capability in response to the Nuclear Posture Review, recommendations of the United States Strategic Command (USSTRATCOM) Strategic Advisory Group, USSTRATCOM Commander Guidance, and the Defense Science Board Task Force on Nuclear Deterrence. The program conducts any necessary studies and assesses both legacy and future ICBM Guidance System technology applications. Efforts are focused on current and future requirements and technologies, reduced life cycle costs, and increased nuclear surety and safety. Activities leverage the efforts of the Science and Technology community and are coordinated with the Navy strategic applications program to enhance synergy and avoid duplication. Key elements include developing responsive technologies with common applications for future strategic guidance capabilities. This program also includes any needed nuclear surety and certification and system vulnerability assessments.

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 0605831F or 0605833F. In FY 2021 0.000M was expended for civilian pay expenses in this program element, and in FY 2022 0.000M is forecasted for civilian pay expenses in this program element.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Guidance Applications Program	18.875	8.022	4.137
Description: Develop and mature advanced technologies and concepts to support future requirements. ***FY 2022 Plans:*** • Continue development of a Micro-Electro Mechanical System for potential insertion into the Path Length Module. • Continue evaluating emerging strategic instrument technologies for future strategic grade gyros and accelerometers to ensure appropriate test capability development, to include gyrometer and nested Inertial Measuring Unit (IMU) development. • Rapidly respond to evolving warfighter priorities and emerging requirements. ***FY 2023 Plans:*** • Continue development of a Micro-Electro Mechanical System for potential insertion into the Path Length Module. • Continue evaluating emerging strategic instrument technologies for future strategic grade gyros and accelerometers to ensure appropriate test capability development, to include gyrometer and nested IMU development. • Continue to assess and rapidly respond to evolving warfighter priorities and emerging requirements. ***FY 2022 to FY 2023 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603851F / *Intercontinental Ballistic Missile - Dem/Val*	**Project (Number/Name)** 641020 / *ICBM Guidance Applications*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Funding decreased due to ramp down in Dem/Val funding required to continue emerging strategic instrument technology development.			
Accomplishments/Planned Programs Subtotals	18.875	8.022	4.137

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• RDTE 04 PE 0605230F: *GBSD*	1,397.485	2,553.541	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3,951.026
• RDTE 05 PE 0605238F: *Ground Based Strategic Deterrent EMD*	0.000	0.000	3,614.290	-	3,614.290	3,614.629	3,255.759	3,190.113	2,628.739	4,439.300	20,742.830

Remarks

D. Acquisition Strategy

Accomplish studies, analyses, concept development and engineering; efforts will be conducted using contracting strategies deemed most appropriate, generally using competitive contracts and/or other obligating documentation considered most appropriate by obligating and performing agencies involved. Current effort deliverables to include strategic grade guidance prototypes to support multiple ongoing Air Force initiatives.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603851F / *Intercontinental Ballistic Missile - Dem/Val*	**Project (Number/Name)** 641020 / *ICBM Guidance Applications*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GAP Micro-Electronic Module System, Advanced Fuzing	Various	Various : Various	-	2.008	Jan 2021	1.000	Feb 2022	1.000	Dec 2022	-		1.000	Continuing	Continuing	-
GAP Emerging Strategic Instrument Technology (Sparrow)	Various	Various : Various	-	6.472	Jan 2021	6.560	Mar 2022	2.662	Dec 2022	-		2.662	Continuing	Continuing	-
GAP Rad Hard Non-Volatile Memory	Various	Various : Various	-	1.500	Jan 2021	-		-		-		-	Continuing	Continuing	-
GAP Rad Hard Advanced Microelectronics	Various	Various : Various	-	8.690	Jan 2021	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	18.670		7.560		3.662		-		3.662	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GAP, Program Management Administrative Support Services	C/Various	Various : Various	-	0.205	Jan 2021	0.462	Apr 2022	0.475	Dec 2022	-		0.475	Continuing	Continuing	-
		Subtotal	-	0.205		0.462		0.475		-		0.475	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	18.875		8.022		4.137		-		4.137	Continuing	Continuing	N/A

Remarks

Rad Hard Non-Volatile Memory transitioned to RVAP in FY22 to more accurately reflect potential future applicability of technology.
Rad Hard Advanced Microelectronics transitioned to RVAP in FY21 to more accurately reflect potential future applicability of technology.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603851F / *Intercontinental Ballistic Missile - Dem/Val*	**Project (Number/Name)** 641020 / *ICBM Guidance Applications*

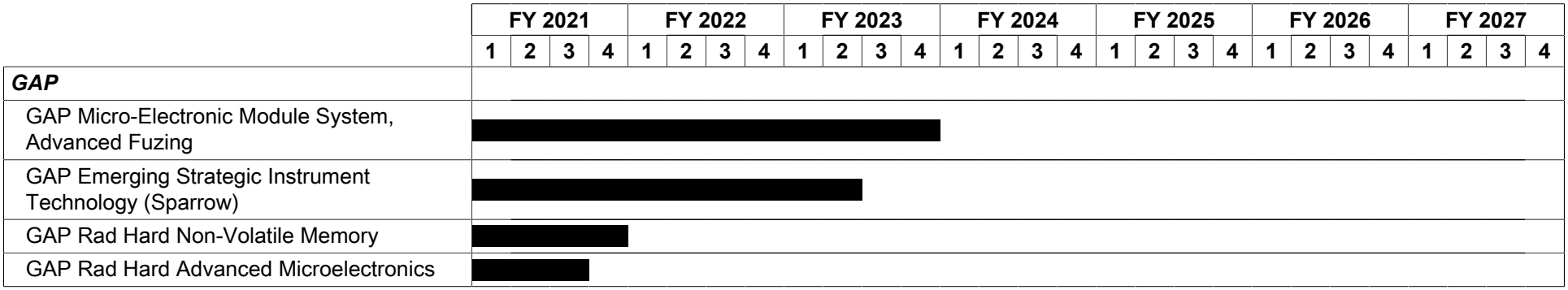

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603851F / *Intercontinental Ballistic Missile - Dem/Val*	**Project (Number/Name)** 641020 / *ICBM Guidance Applications*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
GAP				
GAP Micro-Electronic Module System, Advanced Fuzing	1	2021	4	2023
GAP Emerging Strategic Instrument Technology (Sparrow)	1	2021	2	2023
GAP Rad Hard Non-Volatile Memory	1	2021	4	2021
GAP Rad Hard Advanced Microelectronics	1	2021	3	2021

Note

Rad Hard Non-Volatile Memory transitioned to RVAP in FY22 to more accurately reflect potential future applicability of technology.
Rad Hard Advanced Microelectronics transitioned to RVAP in FY21 to more accurately reflect potential future applicability of technology.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603851F / *Intercontinental Ballistic Missile - Dem/Val*	Project (Number/Name) 641021 / *ICBM Propulsion Applications*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
641021: *ICBM Propulsion Applications*	-	5.262	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 Propulsion Applications Program (PAP) develops and assesses strategic propulsion system technology applications for both legacy and future ICBM propulsion systems through projects exploring improvements and/or alternatives to current propulsion systems, conducting studies assessing application of new technologies to meet future common propulsion systems requirements, and assessing opportunities for applying common materials and technology between the ICBM, submarine-launched ballistic missile (SLBM) propulsion systems, and other rocket motor propulsion capabilities. Efforts are focused on current and future requirements and technologies, reduced life cycle costs, and increased nuclear surety, safety, certification and system vulnerability assessments.

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 0605831F or 0605833F. In FY 2021 0.000M was expended for civilian pay expenses in this program element, and in FY 2022 0.000M is forecasted for civilian pay expenses in this program element.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Propulsion Applications Program	5.262	0.000	0.000
Description: Assess, develop, evaluate, and demonstrate common solid and liquid propulsion technology and manufacturing leading up to a static fire and test of strategic propulsion systems; develop capability and explore improvements to current and future propulsion systems; and support the research and development industrial base and critical infrastructure. ***FY 2022 Plans:*** N/A ***FY 2023 Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	5.262	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603851F / *Intercontinental Ballistic Missile - Dem/Val*	**Project (Number/Name)** 641021 / *ICBM Propulsion Applications*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• RDTE 04 PE 0605230F: *GBSD*	1,397.485	2,553.541	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3,951.026
• RDTE 05 PE 0605238F: *Ground Based Strategic Deterrent EMD*	0.000	0.000	3,614.290	-	3,614.290	3,614.629	3,255.759	3,190.113	2,628.739	4,439.300	20,742.830

Remarks

D. Acquisition Strategy

Studies, analyses, limited engineering, hardware development and/or testing will be accomplished; efforts will be conducted using contracting strategies deemed most appropriate, generally using competitive contracts and/or other obligating documentation considered most appropriate by obligating and performing agencies involved. Current effort deliverables include flight test demonstrations to support multiple studies.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603851F / *Intercontinental Ballistic Missile - Dem/Val*	Project (Number/Name) 641021 / *ICBM Propulsion Applications*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Flight Test	Various	Various : Various	-	4.983	Jun 2021	-		-		-		-	0.000	4.983	-
		Subtotal	-	4.983		-		-		-		-	0.000	4.983	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PAP Program Management Administration	Various	Various : Various	-	0.279	Jan 2021	-		-		-		-	0.000	0.279	-
		Subtotal	-	0.279		-		-		-		-	0.000	0.279	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	5.262		-		-		-		-	0.000	5.262	N/A

Remarks

Developmental Flight Test efforts transitioned to LRP in FY22. Flight tests enable demonstration of technologies in relevant ICBM environments.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603851F / *Intercontinental Ballistic Missile - Dem/Val*	**Project (Number/Name)** 641021 / *ICBM Propulsion Applications*

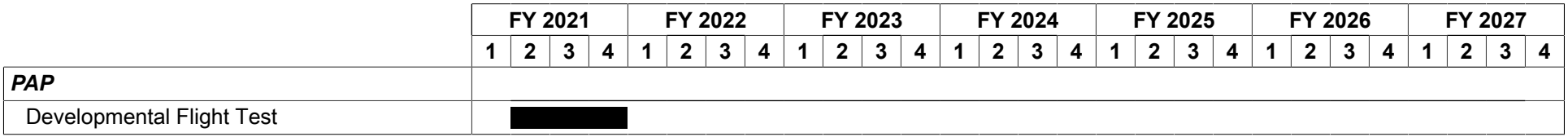

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603851F / *Intercontinental Ballistic Missile - Dem/Val*	**Project (Number/Name)** 641021 / *ICBM Propulsion Applications*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
PAP				
Developmental Flight Test	2	2021	4	2021

Note

Developmental Flight Test efforts transitioned to LRP in FY22. Flight tests enable demonstration of technologies in relevant ICBM environments.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603851F / *Intercontinental Ballistic Missile - Dem/Val*	Project (Number/Name) 641022 / *ICBM Reentry Vehicle Applications*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
641022: *ICBM Reentry Vehicle Applications*	-	10.456	45.166	13.042	0.000	13.042	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Reentry Vehicle Applications Program (RVAP) ensures the ICBM force is equipped with the safest, most reliable, most survivable Reentry Systems, and explores options for common, multi-mission capabilities. The program enables a responsive engineering infrastructure by developing modeling/simulation, ground and flight test platforms to support Reentry System qualifications. The program ensures the availability of long-lead components and materials while identifying life cycle cost reduction methods. In addition, the program matures and tests advanced Reentry System technologies and designs to meet future requirements. This includes conducting any necessary studies and assessing technology applications relevant to Mk12A, Mk21, Mk21A and future ICBM Reentry Systems. The program leverages investments by the Science & Technology community and Navy reentry systems applications program. Testing may occur on a space available basis on Air Force and Navy Force Development Evaluation (FDE) flights.

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 0605831F or 0605833F. In FY 2021 0.000M was expended for civilian pay expenses in this program element, and in FY 2022 0.000M is forecasted for civilian pay expenses in this program element.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Reentry Vehicle Applications Program	10.456	45.166	13.042
Description: Mature, evaluate, and test reentry system materials, technologies, and vehicles including modeling/simulation, and ground and flight test platforms for use in current and future strategic applications.			
FY 2022 Plans: • Continue new modeling/simulation and flight test platforms for future weapon qualification activities. • Continue study for future RV concepts. • Develop designs and production concepts for trusted radiation-hardened advanced microelectronics. • Design predictive health management tool based on engineering predictive analysis. • Conclude design of Virtual Environment Trainer for ICBM Platforms. • Initiate thermal protection systems (TPS) materials research. • Initiate digital engineering research. • Initiate Rad Hard Non-Volatile Memory research. • Initiate Rad Hard Radar research.			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603851F / *Intercontinental Ballistic Missile - Dem/Val*	**Project (Number/Name)** 641022 / *ICBM Reentry Vehicle Applications*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
• Continue the Joint Technology Demonstrator effort. • Rapidly respond to evolving warfighter priorities and emerging requirements. ***FY 2023 Plans:*** • Continue new modeling/simulation and flight test platforms for future weapon qualification activities. • Continue study for future RV concepts. • Design predictive health management tool based on engineering predictive analysis. • Continue thermal protection systems (TPS) materials research. • Continue digital engineering research. • Continue the future system demonstrator effort (formerly Joint Technology Demonstrator). • Continue Rad Hard Non-Volatile Memory research • Continue Rad Hard Radar research • Initiate navigation aids/instrumentation & sensor research • Initiate ground testing & capabilities research • Rapidly respond to evolving warfighter priorities and emerging requirements. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreased due to completion in FY23 of Advanced Concept Studies, initial Radiation Hardened Advanced Microelectronics Studies, and Virtual Environment Trainer development.			
Accomplishments/Planned Programs Subtotals	10.456	45.166	13.042

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• RDTE 04 PE 0605230F: *Ground Based Strategic Deterrent*	1,397.485	2,553.541	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3,951.026
• RDTE 05 PE 0605238F: *Ground Based Strategic Deterrent EMD*	0.000	0.000	3,614.290	-	3,614.290	3,614.629	3,255.759	3,190.113	2,628.739	4,439.300	20,742.830
• RDTE 07 PE 0101328F: *ICBM Reentry Vehicles*	108.625	96.313	118.616	-	118.616	368.449	640.795	835.562	854.140	Continuing	Continuing

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603851F / *Intercontinental Ballistic Missile - Dem/Val*	**Project (Number/Name)** 641022 / *ICBM Reentry Vehicle Applications*

D. Acquisition Strategy

Studies, analyses, limited engineering, and pre-prototype hardware development will be accomplished; efforts will be conducted using contracting strategies deemed most appropriate, generally using competitive contracts and/or other obligating documentation considered most appropriate by obligating and performing agencies involved. Current effort deliverables include various technologies for ICBM re-entry vehicles including modeling and simulation software, alternate high temperature materials, advanced concepts, and radiation-hardened microelectronics.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603851F / *Intercontinental Ballistic Missile - Dem/Val*	**Project (Number/Name)** 641022 / *ICBM Reentry Vehicle Applications*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
RVAP Support 1.0	C/FFP	BAE Systems : Clearfield, UT	-	3.100	Mar 2021	2.800	Jan 2022	-		-		-	Continuing	Continuing	-
RVAP Support 2.0	C/FFP	TBD : TBD	-	-		-		1.400	Nov 2022	-		1.400	Continuing	Continuing	-
RVAP Study Support	C/FFP	Aerospace : Various	-	-		0.900	Apr 2022	-		-		-	0.000	0.900	-
RVAP Engineering Support	C/FP	JHU/APL : Various	-	-		0.500	May 2022	0.500	Dec 2022	-		0.500	Continuing	Continuing	-
		Subtotal	-	3.100		4.200		1.900		-		1.900	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
RVAP Future System Demonstrator	MIPR	Various : Various	-	0.500	Feb 2021	1.000	Apr 2022	3.000	Nov 2022	-		3.000	Continuing	Continuing	-
RVAP Modeling and Simulation Programs	Various	Various : Various	-	1.300	Feb 2021	0.500	Aug 2022	0.500	Nov 2022	-		0.500	Continuing	Continuing	-
RVAP Advanced Concept Studies	Various	Various : Various	-	3.100	Jan 2021	4.000	Apr 2022	1.500	Nov 2022	-		1.500	0.000	8.600	-
RVAP Virtual Environment Trainer Launch Facility Prototype	C/CPAF	By Light Professional IT : Orlando, FL	-	-		0.500	May 2022	-		-		-	0.000	0.500	-
RVAP Radiation-Hardened Advanced Microelectronics	Various	Various : Various	-	0.954	Jan 2021	6.566	Jan 2022	2.841	Nov 2022	-		2.841	Continuing	Continuing	-
RVAP Flight Test	Various	Various : Various	-	0.800	Jun 2021	-		-		-		-	0.000	0.800	-
RVAP Rad Hard Non-Volatile Memory	Various	Various : Various	-	-		0.500	Apr 2022	1.500	Nov 2022	-		1.500	Continuing	Continuing	-
RVAP Navigation Aids/ Instrumentation	TBD	Not specified. : TBD	-	-		0.250	Jul 2022	1.301	Nov 2022	-		1.301	Continuing	Continuing	-
AFGSC Innovation Hub Apps	Various	Various : Various	-	-		27.000	Jul 2022	-		-		-	Continuing	Continuing	-
		Subtotal	-	6.654		40.316		10.642		-		10.642	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603851F / *Intercontinental Ballistic Missile - Dem/Val*	**Project (Number/Name)** 641022 / *ICBM Reentry Vehicle Applications*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
RVAP Program Management Administration	Various	Various : Various	-	0.702	Jan 2021	0.650	Apr 2022	0.500	Nov 2022	-		0.500	Continuing	Continuing	-
		Subtotal	-	0.702		0.650		0.500		-		0.500	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	10.456		45.166		13.042		-		13.042	Continuing	Continuing	N/A

Remarks

Joint Technology Demonstrator has been renamed Future System Demonstrator.

Developmental Flight Test efforts transitioned to LRP in FY22.

Rad Hard Non-Volatile Memory transitioned from GAP to RVAP in FY22 to more accurately reflect potential future applicability of technology.

Rad Hard Advanced Microelectronics transitioned from GAP to RVAP in FY21 to more accurately reflect potential future applicability of technology.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603851F / *Intercontinental Ballistic Missile - Dem/Val*	**Project (Number/Name)** 641022 / *ICBM Reentry Vehicle Applications*

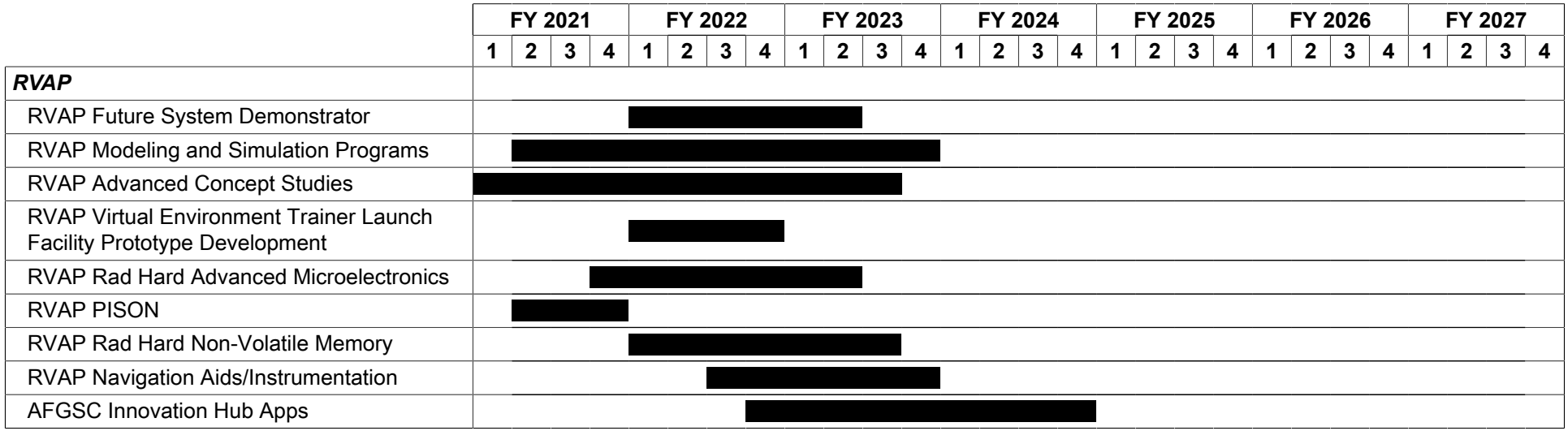

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603851F / *Intercontinental Ballistic Missile - Dem/Val*	**Project (Number/Name)** 641022 / *ICBM Reentry Vehicle Applications*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
RVAP				
RVAP Future System Demonstrator	1	2022	2	2023
RVAP Modeling and Simulation Programs	2	2021	4	2023
RVAP Advanced Concept Studies	1	2021	3	2023
RVAP Virtual Environment Trainer Launch Facility Prototype Development	1	2022	4	2022
RVAP Rad Hard Advanced Microelectronics	4	2021	2	2023
RVAP PISON	2	2021	4	2021
RVAP Rad Hard Non-Volatile Memory	1	2022	3	2023
RVAP Navigation Aids/Instrumentation	3	2022	4	2023
AFGSC Innovation Hub Apps	4	2022	4	2024

Note

Joint Technology Demonstrator has been renamed Future System Demonstrator.

Developmental Flight Test efforts transitioned to LRP in FY22.

Rad Hard Non-Volatile Memory transitioned from GAP to RVAP in FY22 to more accurately reflect potential future applicability of technology.

Rad Hard Advanced Microelectronics transitioned from GAP to RVAP in FY21 to more accurately reflect potential future applicability of technology.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603851F / *Intercontinental Ballistic Missile - Dem/Val*	Project (Number/Name) 644209 / *Long Range Planning (LRP)*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
644209: *Long Range Planning (LRP)*	-	0.162	23.433	29.253	0.000	29.253	16.717	28.424	7.821	7.995	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Long Range Planning (LRP) effort identifies and analyzes potential modifications to current and future Intercontinental Ballistic Missile (ICBM) Weapon Systems required to meet objectives relative to executing flight tests, long-term sustainment, technology insertion, battle space awareness, employment, force structure and future systems. The studies will focus on system supportability, operability, reliability, innovation and maintainability. Options/concepts generated by these studies are evaluated for feasibility, system impacts, and cost. The LRP supports and conducts testing, and future weapon systems development and deployment. Pre-milestone activities may be conducted for current or future ICBM weapon systems to include entry criteria for milestone activities.

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 0605831F or 0605833F. In FY 2021 0.000M was expended for civilian pay expenses in this program element, and in FY 2022 0.000M is forecasted for civilian pay expenses in this program element.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Long Range Planning	0.162	23.433	29.253
Description: Analyze, study and plan current and future ICBM activities to meet requirements for long-term sustainment, technology insertion, employment force structure and future systems. ***FY 2022 Plans:*** • Continue developmental test flight capabilities that were started in Reentry Vehicle Applications and Propulsion Applications. ***FY 2023 Plans:*** • Continue developmental test flight efforts • Initiate terminal tracking and scoring research • Rapidly respond to evolving warfighter priorities and emerging requirements. • Conduct any necessary roadmap studies ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increased due to continuation of FY23 and FY25 Developmental Flight Test efforts as well as initiating Terminal Tracking and Scoring research.			
Accomplishments/Planned Programs Subtotals	0.162	23.433	29.253

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603851F / *Intercontinental Ballistic Missile - Dem/Val*	**Project (Number/Name)** 644209 / *Long Range Planning (LRP)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• RDTE 04 PE 0605230F: *GBSD*	1,397.485	2,553.541	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3,951.026
• RDTE 05 PE 0605238F: *Ground Based Strategic Deterrent EMD*	-	-	3,614.290	-	3,614.290	3,614.629	3,255.759	3,190.113	2,628.739	4,439.300	20,742.830

Remarks

D. Acquisition Strategy

Analysis will be accomplished; efforts will be conducted using contracting strategies deemed most appropriate, generally using competitive contracts and/or other obligating documentation considered most appropriate by obligating and performing agencies involved.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603851F / *Intercontinental Ballistic Missile - Dem/Val*	**Project (Number/Name)** 644209 / *Long Range Planning (LRP)*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
LRP Support	C/CPFF	TBD : TBD	-	-		-		1.893	Nov 2022	-		1.893	Continuing	Continuing	-
LRP Study Support	C/CPFF	Aerospace : Various	-	-		-		0.450	Nov 2022	-		0.450	0.000	0.450	-
LRP Engineering Support	C/CPFF	JHU/APL : Various	-	-		-		1.015	Nov 2022	-		1.015	Continuing	Continuing	-
		Subtotal	-	-		-		3.358		-		3.358	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
LRP FY23 Developmental Flight Test	Various	Various : Various	-	-		23.433	Apr 2022	13.000	Nov 2022	-		13.000	0.000	36.433	-
LRP FY25 Developmental Flight Test	TBD	TBD : TBD	-	-		-		10.000	Feb 2023	-		10.000	Continuing	Continuing	-
LRP Virtual Environment Trainer	Various	Various : Various	-	0.162	Feb 2021	-		-		-		-	Continuing	Continuing	-
LRP Terminal Tracking & Scoring	TBD	TBD : TBD	-	-		-		1.793	Feb 2023	-		1.793	Continuing	Continuing	-
		Subtotal	-	0.162		23.433		24.793		-		24.793	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
LRP Program Management	Various	Various : Various	-	-		-		1.102	Nov 2022	-		1.102	0.000	1.102	-
		Subtotal	-	-		-		1.102		-		1.102	0.000	1.102	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.162		23.433		29.253		-		29.253	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0603851F / *Intercontinental Ballistic Missile - Dem/Val*	Project (Number/Name) 644209 / *Long Range Planning (LRP)*	

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Developmental flight tests require two years of funding prior to the test to support planning/execution activities. Developmental flight tests enable us to demonstrate developing technologies in relevant ICBM environments.

FY23 Developmental Flight Test funding started in FY21 under RVAP and PAP and will meet combined technology demonstration needs between the Dem/Val and Mk21A programs.

VET-LF moved from LRP to RVAP in FY22.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603851F / *Intercontinental Ballistic Missile - Dem/Val*	**Project (Number/Name)** 644209 / *Long Range Planning (LRP)*

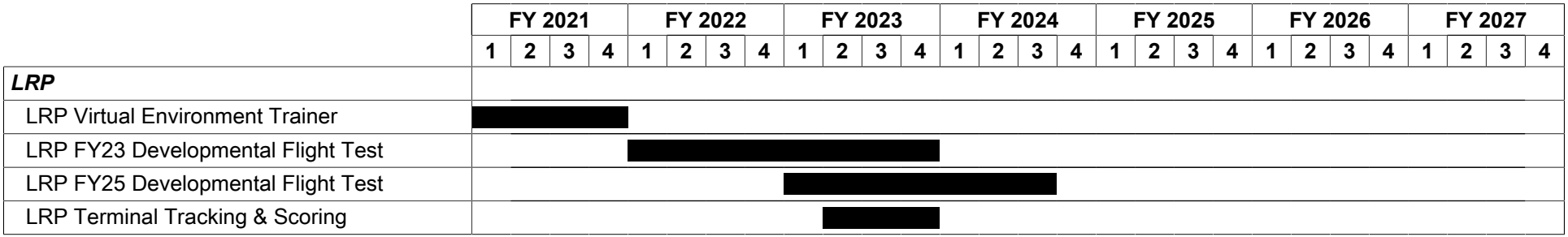

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0603851F / *Intercontinental Ballistic Missile - Dem/Val*	**Project (Number/Name)** 644209 / *Long Range Planning (LRP)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
LRP				
LRP Virtual Environment Trainer	1	2021	4	2021
LRP FY23 Developmental Flight Test	1	2022	4	2023
LRP FY25 Developmental Flight Test	1	2023	3	2024
LRP Terminal Tracking & Scoring	2	2023	4	2023

Note

Developmental flight tests require two years of funding prior to the test to support planning/execution activities. Developmental flight tests enable us to demonstrate developing technologies in relevant ICBM environments.

FY23 Developmental Flight Test funding started in FY21 under RVAP and PAP and will meet combined technology demonstration needs between the Dem/Val and Mk21A programs.

VET-LF moved from LRP to RVAP in FY22.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0604001F / *NC3 Advanced Concepts*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	0.000	6.900	5.098	0.000	5.098	0.000	0.000	0.000	0.000	Continuing	Continuing
646020: *NC3 Advanced Concepts*	-	0.000	6.900	5.098	0.000	5.098	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

NC3 Advanced Concepts previously executed from PE 0303131F /BPAC 672832, MEECN System Improvements (MSI), funded in FY19 only.

A. Mission Description and Budget Item Justification

Nuclear Command, Control, and Communications (NC3) Advanced Concepts is required for development and prototyping of next generation NC3 systems and sub-systems. This program ensures a responsive design and development engineering infrastructure to address evolving Nuclear Deterrence Operations (NDO) mission requirements; emerging issues and technology insertion/technology application on the NC3 Weapon System (WS), future strategic systems/capability, and other common strategic areas where appropriate; and develop enhanced multi-use capabilities. The NC3 Advanced Concepts Program will provide technology maturation and risk reduction activities to support the AF NC3 Weapon System (AN/USQ-225). Activity will reduce life cycle costs, inform technology maturation & risk reduction efforts, improve system performance, mitigate evolving threats, and ensure both viability and durability of the AF NC3 Weapon System.

Additional details can be provided at a higher classification.

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 0605831F and 0605833F. In FY21 $0.0M was expended for civilian pay expenses in this program element, in FY22 $0.0M is forecasted for civilian pay expenses in this program element.

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604001F / *NC3 Advanced Concepts*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.000	6.900	0.000	0.000	0.000
Current President's Budget	0.000	6.900	5.098	0.000	5.098
Total Adjustments	0.000	0.000	5.098	0.000	5.098
• 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	5.098	0.000	5.098

Change Summary Explanation

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY 2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: NC3 Advanced Concepts	0.000	6.900	5.098

Description: NC3 Advanced Concepts activities will include, but are not limited to: conducting studies, analysis, and prototyping; test bed activities; exercise participation; developing modeling and simulation of identified NC3 WS architecture; integrated NC3 WS testing, validation, and certification; and direct mission support contracts in support of next generation NC3 systems and sub-systems. NC3 Advanced Concepts ensures a responsive design and development engineering infrastructure to address evolving NDO.

FY 2022 Plans:

Initiate studies, analysis, and prototyping; test bed activities; exercise participation; develop modeling and simulation of identified NC3 WS architecture; integrate NC3 WS testing, validation, and certification; and direct mission support contracts in support of next generation NC3 systems and sub-systems.

FY 2023 Plans:

Continue studies, analysis, and prototyping; test bed activities; exercise participation; develop modeling and simulation of identified NC3 WS architecture; integrated NC3 WS testing, validation, and certification; direct mission support contracts in

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604001F / *NC3 Advanced Concepts*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
support of next generation NC3 systems and sub-systems; rapidly respond to evolving warfighter priorities and warfighter requirements. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease from FY22 to FY23 reflects reduction to Direct Mission Support contracts.			
Accomplishments/Planned Programs Subtotals	0.000	6.900	5.098

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

To conduct NC3 Advanced Concepts essential activities, a combination of competitively awarded contracts, sole source contracts, and/or other transaction authority, may be used to augment Air Force organic capabilities with technical skill sets from Federally Funded Research and Development Centers (FFRDCs), research laboratories, University-Affiliated Research Centers (UARCs), and industry Advisory and Assistance Services (A&AS) providers. All NC3 Advanced Concepts activities will be evaluated for promising technologies and considered for tech transition into the Air Force NC3 Weapon System.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604001F / *NC3 Advanced Concepts*	Project (Number/Name) 646020 / *NC3 Advanced Concepts*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NC3 Advanced Concepts	Various	Various : Various	-	-		6.900	Apr 2022	5.098	Nov 2022	-		5.098	Continuing	Continuing	-
		Subtotal	-	-		6.900		5.098		-		5.098	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		6.900		5.098		-		5.098	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604001F / *NC3 Advanced Concepts*	**Project (Number/Name)** 646020 / *NC3 Advanced Concepts*

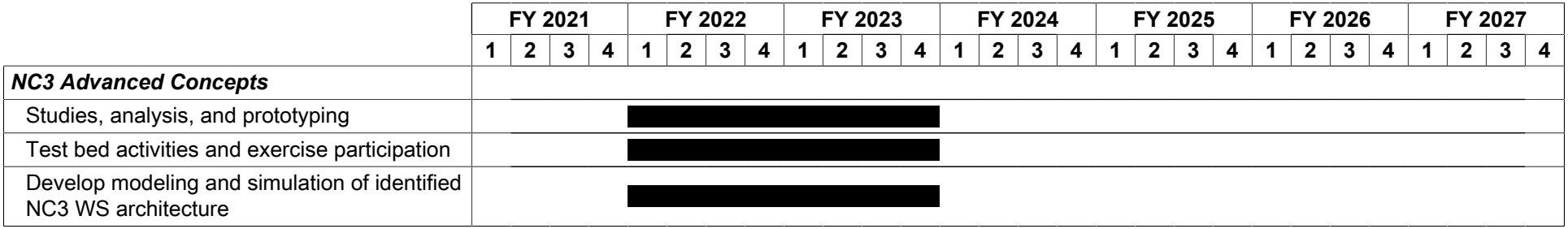

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604001F / *NC3 Advanced Concepts*	**Project (Number/Name)** 646020 / *NC3 Advanced Concepts*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
NC3 Advanced Concepts				
Studies, analysis, and prototyping	1	2022	4	2023
Test bed activities and exercise participation	1	2022	4	2023
Develop modeling and simulation of identified NC3 WS architecture	1	2022	4	2023

Note

NC3 Advanced Concepts (Level of Effort)

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0604002F / *Air Force Weather Services Research*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	2.151	3.855	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
643560: *AF Weather Services Research*	-	2.151	3.855	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2023, PE 0604002F Air Force Weather Services Research, Project 643560, AF Weather Services Research efforts were transferred to PE 0604002S, Space Force Weather Services Research, Project 645353, SF Weather Services Research in order to align four current AFWS programs to the USSF.

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 Air Force Weather Services (AFWS) in support of the 2018 National Defense Strategy's (NDS) three lines of effort. To improve readiness for a more lethal force, AFWS provides timely, accurate, resilient and relevant environmental information, to include space and terrestrial weather, for global battlespace situational awareness for the Air Force (AF), Army, Special Operations Forces (SOF), Space Force (USSF), combatant commands, the Intelligence Community (IC), and other government agencies. AFWS 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. AFWS development enhances the lethality, effectiveness, and survivability of AF 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, weaponeering, battle damage assessment, and space systems operations. To strengthen alliances and partnerships, AFWS development efforts integrate Department of Defense (DoD), government agency, commercial, and international partner environmental data with AFWS 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, AFWS 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.

AFWS 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 0604002F, Project 643560 - Air Force Weather Services Research.

1. 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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604002F / *Air Force Weather Services Research*

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. In FY21, 0M was expended for civilian pay expenses in this program element, and in FY22 $0M is forecasted for civilian pay expenses in this program element.

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

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	2.234	0.986	0.000	0.000	0.000
Current President's Budget	2.151	3.855	0.000	0.000	0.000
Total Adjustments	-0.083	2.869	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	2.869			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.083	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Project: 643560: *AF Weather Services Research*		
Congressional Add: *Drought Warning System*	1.286	2.869
Congressional Add Subtotals for Project: 643560	1.286	2.869
Congressional Add Totals for all Projects	1.286	2.869

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Space Weather Analysis and Forecast System (SWAFS) magnetospheric Energetic Charged Particle Hazard Assessment (SWAFS-ECP HAS)	0.288	0.000	0.000
Description: The SWAFS legacy baseline is currently being redesigned and upgraded under the Space Domain Awareness Environmental Toolkit for Defense (SET4D) program to satisfy Space Domain Awareness (SDA) goals for a modern cloud hosted infrastructure that is cyber resilient and integrated with the Unified Data Library (UDL). The Energetic Charged Particle			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604002F / *Air Force Weather Services Research*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Hazard Assessment System (ECP HAS) is one of several models and applications within the SET4D environment designed to 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. ***FY 2022 Plans:*** N/A ***FY 2023 Plans:*** Air Force Weather PE 0604002F will transfer to the United States Space Force PE 0604002S under organizational realignment from AF/ACC to SSC/ECZG. This is not a new start. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Program Will transfer to United States Space Force.			
Title: Space Weather Analysis and Forecast System (SWAFS) Scintillation Nowcast and Forecast Technology (SNFT) software upgrade ***Description:*** SWAFS SNFT AFRL 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. ***FY 2022 Plans:*** - Continue the AFRL AoA upgraded scintillation software. - Assess the maturity and readiness of scintillation software for integration into the SWAFS cloud environment. - Develop software prototypes based on the previous development of physics-based algorithms to rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. ***FY 2023 Plans:*** Air Force Weather PE 0604002F will transfer to the United States Space Force PE 0604002S under organizational realignment from AF/ACC to SSC/ECZG. This is not a new start. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Program will transfer to United States Space Force	0.577	0.986	0.000
Accomplishments/Planned Programs Subtotals	0.865	0.986	0.000

	FY 2021	FY 2022
Congressional Add: Drought Warning System	1.286	2.869

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604002F / *Air Force Weather Services Research*

	FY 2021	FY 2022
FY 2021 Accomplishments: - Review all new Broad Agency Announcement (BAA) white papers and request proposals. - Award 1 to 2 new contracts from new BAA, subject to change based on number of white paper submissions - and will look for efforts that will help to build upon previous AF Weather Service drought research efforts. - Research & prototype development will center on global drought research warning and mitigation, with emphasis/applications on extreme weather event forecasting, drought climate studies and regional destabilization analysis, effects to strategic basing and DoD installation environmental resiliency, and possible efforts for flood mitigation. ***FY 2022 Plans:*** Will develop an initial Global Composite Drought Indicator (GCDI) capability that utilizes operational, publicly available global data sets related to precipitation, soil moisture, evapotranspiration, and vegetation health to produce a beta version of the GCDI for global, drought 'hot spot' detection.		
Congressional Adds Subtotals	1.286	2.869

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• RDTE 07 0305111F: *WEATHER SERVICE*	4.099	4.362	-	-	-	-	-	-	-	0.000	8.461
• RDTE 07 1203940S: *Space Situation Awareness Operations*	-	-	3.051	-	3.051	3.816	3.022	3.113	3.175	Continuing	Continuing

Remarks

0305111F BPAC 672738 3600 funds on Air Force PE located in IDECS.

PEM update: C. Accomplishments section FY23 will be zeroed and not equal 0.792 due to the PE transfer to USSF.

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.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604002F / *Air Force Weather Services Research*	**Project (Number/Name)** 643560 / *AF Weather Services Research*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SWAFS ECP HAS Analysis of Alternatives	PO	AFRL : Kirtland AFB, NM	-	0.288	Oct 2020	-		-		-		-	0.000	0.288	-
SWAFS Scintillation Nowcast Forecast Model Update AoA	PO	AFRL : Kirtland AFB, NM	-	0.577	Oct 2020	3.855	Jan 2022	-		-		-	0.000	4.432	-
Drought Warning System R&D	Various	Various : Various	-	1.286	Jul 2021	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	2.151		3.855		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	2.151		3.855		-		-		-	Continuing	Continuing	N/A

Remarks

PEM Update: R-3 category for FY23 will be 0 not 0.792 due to PE transfer to USSF.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604002F / *Air Force Weather Services Research*	**Project (Number/Name)** 643560 / *AF Weather Services Research*

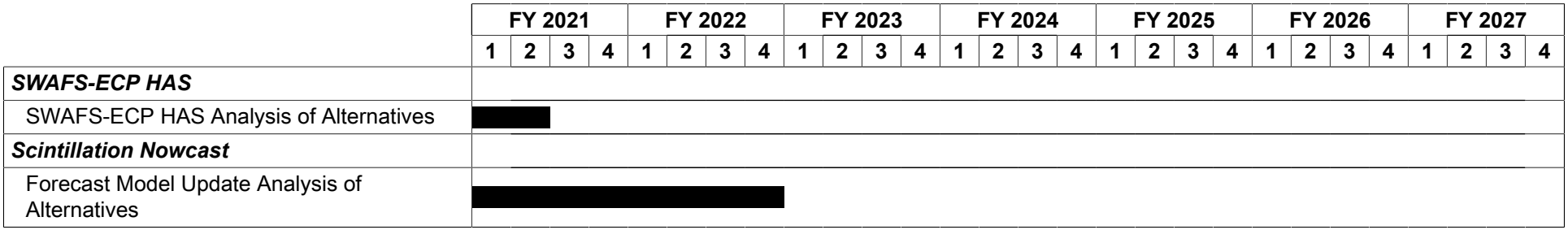

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604002F / *Air Force Weather Services Research*	**Project (Number/Name)** 643560 / *AF Weather Services Research*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
SWAFS-ECP HAS				
SWAFS-ECP HAS Analysis of Alternatives	1	2021	2	2021
Scintillation Nowcast				
Forecast Model Update Analysis of Alternatives	1	2021	4	2022

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0604003F / *Advanced Battle Management System (ABMS)*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	152.691	268.849	231.408	0.000	231.408	556.108	681.467	870.839	614.744	Continuing	Continuing
640141: *Advanced Battle Management System (ABMS)*	-	152.691	268.849	231.408	0.000	231.408	556.108	681.467	870.839	614.744	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

ABMS is the top modernization priority for the Department of the Air Force (DAF) and its primary contribution to provide decision superiority and meet the Joint All-Domain Command and Control (JADC2) requirements. JADC2 requires that individual military activities not simply be deconflicted, but be integrated - activities in one domain must enhance the effectiveness of those in other domains and compensate for vulnerabilities. ABMS will connect sensors, systems, and weapons across both the U.S. Space Force and U.S. Air Force. ABMS is not a platform or sensor, but instead will be the essential data network that connects and empowers current and future platforms to fight and win in the modern era as defined by the National Defense Strategy and Joint All-Domain Operations Department of Defense directives. Legacy and future sensors from a variety of programs and sources produce data that needs to be made available to those people and systems that need it most. Multi-level secure processing occurs on global distributed clouds, tactical edge nodes, infrastructure, platforms, and end user devices where operators interface with the data and applications at the required classification level. For information to flow, the network must be enabled by a combination of government and commercial connectivity pathways to move data to and through a suite of cloud and local edge-based applications that make sense of the environment and apply advanced algorithms aided by artificial intelligence and machine learning. Strategic, operational, and tactical operators use these applications to manage and direct the desired effects using machine-to-machine connections.

On 24 Nov 2020, the DAF Rapid Capabilities Office (DAF RCO) became the ABMS Integrating Program Executive Office (PEO) in a deliberate transition to start acquiring enduring ABMS capability through focused acquisition efforts and investments in robust digital infrastructure.

ABMS, as an acquisition effort managed by the DAF RCO, will pursue two parallel, symbiotic investment strategies under PE 0604003F: enduring digital infrastructure investments and Capability Releases (CRs) focused on closing kill-chains and delivering immediate operational capability to the warfighter. DAF RCO will focus ABMS investments on six capabilities as part of digital infrastructure and CRs:

1. Secure Processing: The hardware and software for processing and storage through multi-level security globally and edge enabling a full range of military operations.

2. Connectivity: Maturation and integration of open software-defined radios and networks, government-owned waveform libraries, and wideband multi-function RF systems. This element also includes the integration and standards required to leverage advances in commercial technology such as Open Communications Standards (OCS), 5G networks, and connections through multi-orbit satellite communications.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604003F / *Advanced Battle Management System (ABMS)*

3. Data Management: Cloud-based data libraries, data feeds, data wrappers, software-defined data management, and content routing to improve data discoverability and information sharing across the joint force for legacy and future platforms and programs.

4. Applications: Cloud-based applications to provide User Interface/User Experience (UI/UX) capabilities that will position warfighters "on the loop" to provide robust and dynamic battle management, command and control (BMC2) functionality, improved timing, and enhanced decision advantage.

5. Sensor Integration: ABMS will develop government-owned standards and provide open and reusable capabilities, to ensure interoperability with the ABMS digital infrastructure for existing and future military systems.

6. Effects Integration: ABMS will develop government-owned standards to ensure the successful integration of DAF and Joint effects capabilities into the ABMS digital infrastructure for existing and future military systems.

The ABMS Battle Lab will be a digital infrastructure experimentation environment to explore new command and control technologies and develop C2 tactics, techniques, and procedures. The ABMS Battle Lab will allow warfighters direct interaction with software development teams and prototypes in development, which speeds up the feedback loop and product maturity.

The first Capability Release is the Airborne Edge Node (AEN): Leveraging government reference architecture and the enduring digital infrastructure investments in Secure Processing, Connectivity, and Data Management, ABMS Capability Release #1 will connect select Tac Air assets and C2 functions to the ABMS cloud at the tactical edge, enhancing Situational Awareness and decision making at the tactical, operational, and strategic levels. AEN's first implementation will be in a podded solution on the KC-46. This will include a Situational Awareness Tool, which will host mission-relevant applications, and be developed as a roll-on/roll-off stand-alone capability using commercial solutions. CR #1 is the first prototype effort for AEN, and will inform future design and fielding decisions for other platforms and C2 functions to connect to the ABMS cloud.

Cloud-Based C2 (CBC2) modernizes battle management and command and control functions by replacing four existing C2 systems with modern applications, enhanced by AI/ML, to create a common operating picture. The intent is to develop hardware and software solutions that are extensible to all Combatant Commands (COCOMs).

ABMS funding provides for program management support, operational concept development and demonstration, hardware development and integration, software development and integration, and other government costs. The funding will also enable the limited transition of mature and ready capabilities to appropriate programs of record in synchronization with planned modernization activities.

Effective FY22, the categories of Digital Architecture, Standards, and Concepts and Architecture Experimentation and Evaluation are no longer aligned under this PE or executed by the DAF RCO. These efforts can be located in PE 0604006F.

This program element may include necessary civilian pay and National Guard/Reserve Duty expenses required to manage, execute, and deliver ABMS 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,

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604003F / *Advanced Battle Management System (ABMS)*

0605833F, 0605898F, 0606398F. In FY21 $0.848M was expended for civilian pay expenses in this program element, in FY22 forecasted $0.055M civilian pay expenses in this program element, and in FY23 no funding is currently forecasted for civilian pay expenses in this program element.

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

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	158.492	203.849	0.000	0.000	0.000
Current President's Budget	152.691	268.849	231.408	0.000	231.408
Total Adjustments	-5.801	65.000	231.408	0.000	231.408
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	65.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-5.801	0.000			
• Other Adjustments	0.000	0.000	231.408	0.000	231.408

Change Summary Explanation

FY 2021: Program reduced -5.801M in total due SBIR/STTR transfer in the year of execution.

FY 2022: FY22 reflects enacted numbers. Program increased 65.00M (50.00M for Digital Infrastructure and 15.00M general program increase).

FY 2023: Previous President's Budget did not include an FY23 base amount. The current President's Budget reflects the ABMS requested budget position of $231.408M.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Digital Infrastructure	21.591	107.549	86.608
Description: The first three ABMS capabilities (secure processing, connectivity, and data management) are considered the core digital infrastructure and the emphasis of future investments to ensure the ability to connect the joint force and allow decision making superiority at the tactical, operational, and strategic levels faster than the adversary. Secure Processing: Represents the physical infrastructure DAF RCO intends to procure in the initial phase. Investments focus on hybrid commercial and tactical edge multi-level security, multi-cloud environments resulting in secure compute and storage			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604003F / *Advanced Battle Management System (ABMS)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023

capability. Solutions will provide tactical edge secure processing environments and tools enabling remote operations as well as 'on the move' when disconnected from the broader network and global environment. These secure processing solutions will host critical services such as robust data management solutions, zero-trust multi-level security applications, Artificial Intelligence (AI) algorithms and Machine Learning (ML) capabilities.

Connectivity: Delivers capabilities to enable resilient, robust communications and the transport of data globally, to the edge, and through space. This will include the software-defined networking and routing layer to enable content routing across connected nodes through government as well as commercial communication paths. ABMS will integrate into existing and future connectivity solution efforts in order to bridge gaps across existing and future platforms. ABMS will leverage Open Communications Standard (OCS) software-defined radios for integration onto platforms, enabling competitive rapid upgrading and the addition of new waveforms over time. Leveraging OCS for legacy and non-native platforms will allow communication through translation and relay. The software-defined radio solution intended for Capability Release #1 builds on OCS technology in partnership with other PEOs across the DAF. Lastly, ABMS will leverage the rapidly advancing commercial satellite ecosystem to ensure robust and resilient connectivity for the Joint Force.

Data Management: Technologies and solutions will expose data through widely used commercial best practices and techniques such as Application Program Interfaces (APIs), and standardized data fabric solutions. This capability includes the capability for machine-assisted tagging of data across the DAF to enable rapid exploitation and processing. These techniques enable data to rapidly and securely move across multiple security levels and support decision making. Other high priority data management solutions include critical investments in zero-trust multi-level security applications, Artificial Intelligence (AI) applications, and Machine Learning (ML) capabilities.

Title: ABMS Battle Lab
Description:

The ABMS Battle Lab will be a digital infrastructure experimentation environment to explore new command and control technologies and develop C2 tactics, techniques, and procedures. The ABMS Battle Lab will allow warfighters direct interaction with software development teams and prototypes in development, which speeds up the feedback loop and product maturity.

FY 2022 Plans:
Establish ABMS Consortium comprised of traditional and non-traditional companies to perform Operational Analysis, Mission Analysis, Systems Engineering, and Integration of the ABMS Digital Infrastructure.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604003F / *Advanced Battle Management System (ABMS)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
• Continue maturing CONUS and OCONUS clouds by adding more data types, data transfers across classification levels, establishing data and network management standards and tools, and developing and hosting cloud-native applications. • Mature connections between CONUS, OCONUS, and existing clouds. • Begin data architecture, data tagging and data orchestration design solutions and prototypes that enable available data to be exposed, processed and transferred amongst multi-level security ABMS cloud environments. • ABMS Battle Lab: - Refine ABMS Battle Lab definition and initial integrations -- Establish MVP at ShOC-N and Ryan Center -- Integrate with NORAD-USNORTHCOM Homeland Defense Ecosystem -- Establish Battle Lab Data Broker - Develop Instrumentation Plan ***FY 2023 Plans:*** Continue ABMS Consortium comprised of traditional and non-traditional companies to perform Operational Analysis, Mission Analysis, Systems Engineering, and Integration of the ABMS Digital Infrastructure. • Continue maturing CONUS and OCONUS clouds by adding more data types, data transfers across classification levels, establishing data and network management standards and tools, and developing and hosting cloud-native applications. • Continue maturing connections between CONUS, OCONUS, and existing clouds. • Continue data architecture, data tagging and data orchestration design solutions and prototypes that enable available data to be exposed, processed and transferred amongst multi-level security ABMS cloud environments. • ABMS Battle Lab: - Integrate with and expand Battle Lab connections to additional sites / C2 programs - Integrate with and expand Battle Lab connections to Joint Partners, to include Project Convergence and Project Overmatch - Begin deployment of ABMS Digital Infrastructure to the Battle Lab - Integrate with Capability Release #1, Line of Effort #3 ***FY 2022 to FY 2023 Increase/Decrease Statement:*** An increased focus on Operational Analysis and Capability Needs Statements to focus requirements, coupled with applying cloud-based C2 solutions to multiple Combatant Commands (COCOMs), and a Non-Advocate Cost Assessment (NACA) by the			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604003F / *Advanced Battle Management System (ABMS)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Air Force Cost Analysis Agency (AFCAA) on Capability Release #1, the costs for Digital Infrastructure and Capability Releases increase from FY22 to FY23.			
Title: Capability Releases	67.300	161.300	144.800
Description: Capability Releases (CRs) deliver operational capability by leveraging and/or supplementing digital infrastructure investments, while making targeted investments in the remaining three ABMS capabilities of Applications, Sensor Integration, and Effects Integration areas. Title: Capability Release #1 (Airborne Edge Node) Description: Based off of CSAF and CSO requirements and technical maturity, Capability Release #1 (Airborne Edge Node, AEN): Leveraging government reference architecture and the enduring digital infrastructure investments in Secure Processing, Connectivity, and Data Management, ABMS Capability Release #1 will connect select Tac Air assets and C2 functions to the ABMS cloud at the tactical edge, enhancing Situational Awareness and decision making at the tactical, operational, and strategic levels. AEN's first implementation will be in a podded solution on the KC-46. This will include a Situational Awareness Tool, which will host mission-relevant applications, and be developed as a roll-on/roll-off stand-alone capability using commercial solutions. CR #1 is the first prototype effort for AEN, and will inform future design and fielding decisions for other platforms and C2 functions to connect to the ABMS cloud. Title: Cloud-Based C2 Description: Cloud-Based C2 (CBC2) modernizes battle management and command and control functions by replacing four existing C2 systems with modern applications, enhanced by AI/ML, to create a common operating picture. The intent is to develop hardware and software solutions that are extensible to all Combatant Commands (COCOMs). ***FY 2022 Plans:*** • Capability Release #1 (Airborne Edge Node): - Deliver completed open architecture communications subsystems and continue test flights and risk reduction activities - Complete designs and begin development activities to integrate the communications subsystem into a pod form factor for integration on the KC-46			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604003F / *Advanced Battle Management System (ABMS)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
- Develop/select applications to be hosted on the edge compute node to demonstrate processing at the tactical edge and increased SA aboard the KC-46 - Begin build of additional podded systems to meet quantities in the requirement - Coordinate with platform program office(s) on the scope of the Technical Data Package to enable potential follow-on development and/or procurement activities • Cloud-Based C2: - Initiate design activities focused on developing a scalable and extensible data-cloud architecture that leverages artificial intelligence/machine learning (AI/ML) applications and produces a common operating picture. - Develop shared visualization of multiple sources: automated & fused 2D/3D representation of air domain - Ingest, fuse, and analyze data from military, government, and commercial sources to multi-classification cloud environments - Develop automated and operator-selectable tasking of assets, voice, data, and C2 - Stand up ABMS Software Integrator that will help integrate new and existing development teams to create a micro-services Cloud-Based C2 system for N&NC that is fully government owned - Build micro-services based software applications that will enable Cloud-Based C2 - Design and build infrastructure pieces to support Cloud-Based C2 to include but not limited to: platform, cloud, cloud outposts, data transport, tactical data bus, identity management, zero trust network, cyber defense and data storage solutions - Initiate Quarterly minimum viable product (MVP) releases, iteratively building out the Cloud-Based C2 application/software baseline, initially geared towards NORAD & NORTHCOM (N&NC) implementation and execution.			
FY 2023 Plans: • Capability Release #1 (Airborne Edge Node): - Complete integration of capability on the KC-46 and conduct flights for test, military utility assessments, and Concept of Operations experimentation - Complete development of a palletized compute and store enclave with local cloud storage, cloud synchronization, and network management functions - Complete build of additional podded systems to meet quantities in the requirement - Maximize use of digital engineering, modern software development practices, and open architecture principles; develop Technical Data Package to enable potential follow-on development and integration activities • Cloud-Based C2:			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604003F / *Advanced Battle Management System (ABMS)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
- Continue design development activities focused on developing a scalable and extensible data-cloud architecture that leverages artificial intelligence/machine learning (AI/ML) applications and produces a common operating picture - Continue developing shared visualization of multiple sources: automated & fused 2D/3D representation of air domain - Ingest, fuse, and analyze data from military, government, and commercial sources to multi-classification cloud environments - Continue to develop automated and operator-selectable tasking of assets, voice, data and C2 - Continue integrating new and existing development teams with ABMS Software Integrator to create a micro-services Cloud-Based C2 system for N&NC that is fully government owned - Continue building micro-services based software applications that will enable Cloud-Based C2 - Continue efforts to design and build infrastructure pieces to support Cloud-Based C2 to include but not limited to: platform, cloud, cloud outposts, data transport, tactical data bus, identity management, zero trust network, cyber defense and data storage solutions - Continue Quarterly minimum viable product (MVP) releases, iteratively building out the Cloud-Based C2 application/software baseline, targeting minimum viable capability release (MVCR) to N&NC by the end of FY23. - The Cloud-Based C2 application/software baseline is the starting point of Air Combat Command's (ACC) Common Battle-management Interface (CBI), which is the foundation of ACC's Battle Management Command & Control (BMC2) Roadmap. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** An increased focus on Operational Analysis and Capability Needs Statements to focus requirements, coupled with applying cloud-based C2 solutions to multiple Combatant Commands (COCOMs), and a Non-Advocate Cost Assessment (NACA) by the Air Force Cost Analysis Agency (AFCAA) on Capability Release #1, the costs for Digital Infrastructure and Capability Releases increase from FY22 to FY23.			
Title: Digital Architecture, Standards, and Concepts	28.300	0.000	0.000
Description: In FY22, these activities were realigned to Program Element 0604006F. This line of effort develops and continually advances the integrated U.S. Air Force and U.S. Space Force digital architecture in order to enable current and future platforms and systems to operate as an ecosystem, or family of capabilities, in concert with the other Services, the Intelligence Community, and our allies and partners - as one joint and combined team. Open architectures coupled with open standards and a digital engineering ecosystem is critical to all Department of the Air Force programs because they provide the foundation for agility and adaptability over time as well as enabling the modular approach to development and integration across a family of systems. This activity also evaluates the technical and operational feasibility of new technical concepts that may be brought into the architecture through the science, technology, research, and development and experimentation enterprise. Finally, this effort creates and manages the family-of-systems trade space lying between traditional requirements and acquisition roles, turning warfighter requirements into potential integrated architecture level designs "horizontally" across all Program Executive Office "vertically" managed portfolios.			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604003F / *Advanced Battle Management System (ABMS)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY 2022 Plans: • N/A ***FY 2023 Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A			
Title: Architecture Experimentation and Evaluation ***Description:*** In FY22, these activities were realigned to Program Element 0604006F. The Department of Defense needs an agile approach to capability development, integration, and delivery that is both rapid and continuous. Therefore, the program also develops the digital architecture for the Air Force and Space Force via regularly recurring Department of the Air Force Architecture Demonstration and Evaluation events alongside other Services in partnership with one or more operational Commanders. This engine of architecture demonstration and integration affords the opportunity for commanders and operators to shape Minimum Viable capabilities and requirements for operational use. These evaluations and warfighter feedback shape subsequent Department of the Air Force wide architecture activities. The necessity to conduct test and analysis at the architecture level and the speed required by the operational needs require enhanced approaches to traditional test and analysis capabilities, namely new, innovative and sufficiently resourced test and analysis infrastructure, networks, and core subject matter expertise to include employment of military, civilian, reserve, and contractor capabilities. ***FY 2022 Plans:*** N/A ***FY 2023 Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A	35.500	0.000	0.000
Accomplishments/Planned Programs Subtotals	152.691	268.849	231.408

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604003F / *Advanced Battle Management System (ABMS)*

E. Acquisition Strategy

ABMS will build to a portfolio of acquisition efforts and should not be viewed as a monolithic program. The first acquisition effort is an ACAT II, Capability Release #1 (CR #1). The Department of the Air Force Rapid Capabilities Office (DAF RCO) matured the CR #1 (Airborne Edge Node) Acquisition Strategy and it was approved by the Service Acquisition Executive (SAE) on 15 Jun 21. Digital Infrastructure, the second ABMS acquisition strategy, was approved by the SAE in Nov 21.

The ABMS agile acquisition strategy and development approach is modeled after the path of commercial innovation and internet of things technology practices. The acquisition strategy breaks capabilities - that might traditionally be developed as a monolith in the government - up into modular components and then integrates them through open standards and an open architecture. Modularity and openness enable increased competition and continuous innovation, as well as more rapid upgrade of product capabilities. Software development and hardware development can both follow this path—a proven, successful model that is employed in the commercial world as well as in agile government entities.

The iterative nature of technology and speed of technical obsolescence in the 21st century digital age mandate an agile approach to capability development, integration, and delivery that is both rapid and continuous. The DAF RCO will make targeted investments in select areas and technologies to expedite the delivery of warfighter capability and close operational gaps.

To enable the speed and agility required by this acquisition strategy, the ABMS acquisition efforts have developed a contracting strategy that is agile. Though the program employs the full range of contracting authorities, ABMS has established the following three primary Broad Agency Announcements: (1) JADC2 Multi-Award, Multi-Level Security (MA-MLS) Indefinite Delivery/Indefinite Quantity (ID/IQ) vehicle; (2) Open Call, and (3) a Cooperative Research and Development Agreement (CRADA); and (4) already existing contract vehicles where ABMS acquisition efforts are within scope. More information about these calls may be found on https://beta.sam.gov.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604003F / *Advanced Battle Management System (ABMS)*	**Project (Number/Name)** 640141 / *Advanced Battle Management System (ABMS)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DAF RCO - Digital Infrastructure	Various	DAF RCO: Various : TBD	-	21.591	Jun 2021	107.549	Jun 2022	86.608	Jun 2023	-		86.608	Continuing	Continuing	-
DAF RCO - Capability Releases	Various	DAF RCO: Various : TBD	-	67.300	Nov 2020	161.300	Jun 2022	144.800	Jun 2023	-		144.800	Continuing	Continuing	-
CAO - Digital Architectures, Standards, and Concepts Development	Various	Prior to RCO transition : TBD	-	28.300	Oct 2020	-		-		-		-	0.000	28.300	-
		Subtotal	-	117.191		268.849		231.408		-		231.408	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CAO - DAF Architecture Experimentation & Evaluation	Various	Prior to RCO transition : TBD	-	35.500	Oct 2020	-		-		-		-	0.000	35.500	-
		Subtotal	-	35.500		-		-		-		-	0.000	35.500	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	152.691		268.849		231.408		-		231.408	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604003F / *Advanced Battle Management System (ABMS)*	**Project (Number/Name)** 640141 / *Advanced Battle Management System (ABMS)*

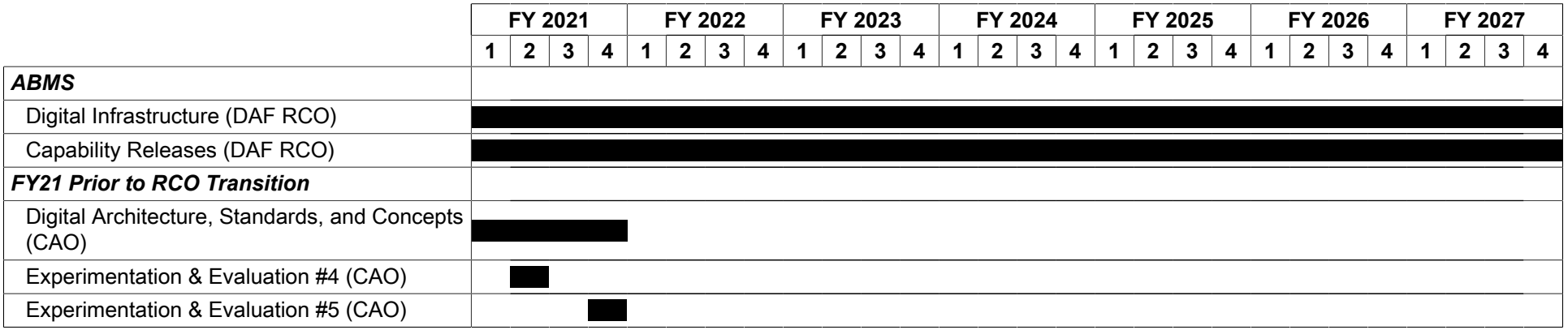

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604003F / *Advanced Battle Management System (ABMS)*	**Project (Number/Name)** 640141 / *Advanced Battle Management System (ABMS)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ABMS				
Digital Infrastructure (DAF RCO)	1	2021	4	2027
Capability Releases (DAF RCO)	1	2021	4	2027
FY21 Prior to RCO Transition				
Digital Architecture, Standards, and Concepts (CAO)	1	2021	4	2021
Experimentation & Evaluation #4 (CAO)	2	2021	2	2021
Experimentation & Evaluation #5 (CAO)	4	2021	4	2021

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0604004F / *Advanced Engine Development*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	642.581	583.712	353.658	0.000	353.658	757.468	917.761	937.646	955.867	Continuing	Continuing
643608: *Advanced Engine Dev*	-	642.581	583.712	353.658	0.000	353.658	757.468	917.761	937.646	955.867	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Advanced Engine Development Program enables demonstration of adaptive engine prototypes. This program is maturing fuel efficient adaptive engine component technologies and reducing associated risk in preparation for next-generation propulsion system development for combat aircraft applications. Adaptive engine technology enables next generation combat aircraft capabilities by combining the efficiency of high bypass turbofans used by commercial airlines with the performance demanded of military fighter engines. This technology has undergone initial development under the auspices of the Air Force Research Laboratory through the Adaptive Versatile Engine Technology (ADVENT) and Adaptive Engine Technology Demonstrator (AETD) programs.

This program element may include necessary emergent or unanticipated 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. In FY 2021 3.064 million was expended for civilian pay expenses in this program element, and in FY 2022 2.199 million is forecasted for civilian pay expenses in this program element.

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

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	665.280	123.712	0.000	0.000	0.000
Current President's Budget	642.581	583.712	353.658	0.000	353.658
Total Adjustments	-22.699	460.000	353.658	0.000	353.658
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	460.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-23.914	0.000			
• Other Adjustments	1.215	0.000	353.658	0.000	353.658

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604004F / *Advanced Engine Development*

Change Summary Explanation

FY 2021 - SBIR/STTR Transfer
FY 2021 - Undistributed 3600 Mark

FY 2022 - Congressional Program Increase - AETP

FY 2023 - The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY 2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Adaptive Engine Transition Program	299.905	473.536	286.096
Description: The Adaptive Engine Transition Program (AETP) will design and manufacture multiple adaptive engine prototypes, complete component rig assessments, characterize materials, and inform manufacturing process improvements. The program will demonstrate adaptive engine technology can be scaled to meet military fighter engine size requirements, while ensuring appropriate manufacturing and technology readiness levels by producing flight-weight prototypes. The prototype engines will demonstrate fuel efficiency increases, thrust increases, and new component technologies by performing sea-level, altitude, and durability assessments across multiple power settings. These assessments will provide data to quantify the capability and reduce risk in areas such as thermal capacity, reliability, and supportability, among others. The FY 2023 Budget Justification Exhibit includes a breakout of the FY 2021 through FY 2023 Next Generation Adaptive Propulsion (NGAP) funds from the AETP effort to increase transparency to Congress. ***FY 2022 Plans:*** Funds prototype engine assessments and airframe integration/adaptive propulsion design efforts. ***FY 2023 Plans:*** Funds continuation of prototype engine assessments and product design activities that include addressing known design improvements, engine weight reduction initiatives, development of engine controls and accessories (Full Authority Digital Engine Control-FADEC) and F-35 integration. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 decreased compared to FY 2022 by $187.44 million. Funding decreased to align with activities executable within the remaining ceiling of the current contracts.			
Title: Next Generation Adaptive Propulsion	342.676	110.176	67.562

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604004F / *Advanced Engine Development*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Description: The Next Generation Adaptive Propulsion (NGAP) effort will design and perform component risk reduction for adaptive engine prototypes enabling Next Generation Air Dominance (NGAD) capabilities. NGAP will select appropriate adaptive engine technologies that can meet Next Generation Air Dominance (NGAD) engine requirements while ensuring appropriate manufacturing and technology readiness levels. The FY 2023 Budget Justification Exhibit includes a breakout of the FY 2021 through FY 2023 Next Generation Adaptive Propulsion (NGAP) funds from the AETP effort to increase transparency to Congress. ***FY 2022 Plans:*** Funds continuation of NGAP preliminary design activities and initiation of prototyping activities for Next Generation Air Dominance (NGAD) capabilities. Prototyping activity will drive digital engineering transformation in the propulsion industry by including requirements for the use of digital design processes, digital thread connectivity between engine and weapon system contractors, and digital product definition and manufacturing. More details can be provided in an appropriate forum. ***FY 2023 Plans:*** Continue adaptive prototyping planning, complete preliminary design activities, and transition to NGAP detailed design activities for Next Generation Air Dominance (NGAD) capabilities. More details can be provided in an appropriate forum. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 Funding decreased compared to FY 2022 by $42.614 million. Funding decrease is reflective of the Air Force priority to enable near-term transition of AETP and the fiscal constraints associated between AETP and NGAP within the program element.			
Accomplishments/Planned Programs Subtotals	642.581	583.712	353.658

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

C. Accomplishments/Planned Programs (in Millions)
Updated FY 2021 distributions reflect a flow of funds to the Adaptive Engine Transition Program to avert a cessation of activities while under the FY 2022 continuing resolution authorities.

E. Acquisition Strategy

For the Adaptive Engine Transition Program, the Air Force awarded two limited source, cost plus incentive fee contracts back in FY 2016 to General Electric and Pratt & Whitney due to their unique qualifications to design a high performance, flight-weight adaptive turbine engine in the thrust class for AETP. Incentive categories include engine weight, performance factors, and maintainability and supportability, with specific metrics for each category incentivized. Embedded in each AETP contract

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604004F / *Advanced Engine Development*

was an option for the Next Generation Adaptive Propulsion (NGAP) effort. In FY 2018, these options were exercised and awarded to optimize risk reduction for Next Generation Air Dominance (NGAD) capabilities through the NGAP effort. Acquisition planning to enable transition of NGAP prototyping activities to new contracts that include digital engineering transformation requirements and increase program acquisition agility is underway. To support transition of the AETP to a program of record, the program office is looking to leverage the remaining scope and ceiling of the current contracts for continuing engine development and integration work in FY 2023. For AETP Engineering, Manufacturing and Development, the program office plans to establish a new contract that includes digital engineering transformation requirements with the selected engine contractor. The government agency responsible for managing this program is the Air Force Life Cycle Management Center, Propulsion Directorate, Wright-Patterson Air Force Base, Ohio.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604004F / *Advanced Engine Development*	**Project (Number/Name)** 643608 / *Advanced Engine Dev*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Adaptive Engine Transition Program - GE	C/CPIF	GE : Evendale, OH	-	130.719	Oct 2020	6.457	Oct 2021	139.849	Oct 2022	-		139.849	0.000	277.025	-
Adaptive Engine Transition Program - PW	C/CPIF	PW : East Hartford, CT	-	163.635	Oct 2020	6.457	Oct 2021	139.849	Oct 2022	-		139.849	0.000	309.941	-
Next Generation Adaptive Propulsion (Preliminary Design) - GE	C/CPIF	GE : Evendale, OH	-	167.223	Oct 2020	47.500	Oct 2021	0.000	Oct 2022	-		0.000	0.000	214.723	-
Next Generation Adaptive Propulsion (Preliminary Design) - PW	C/CPIF	PW : East Hartford, CT	-	170.902	Oct 2020	47.500	Oct 2021	0.000	Oct 2022	-		0.000	0.000	218.402	-
Next Generation Adaptive Propulsion (Detailed Design & Prototyping) - TBD	C/TBD	TBD : TBD	-	-		10.113	Apr 2022	66.046	Oct 2022	-		66.046	Continuing	Continuing	-
		Subtotal	-	632.479		118.027		345.744		-		345.744	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Adaptive Engine Transition Program - Program Management Support	Various	Various : TBD	-	5.551	Dec 2020	460.622	Dec 2021	6.398		-		6.398	0.000	472.571	-
Next Generation Adaptive Propulsion - Program Management Support	Various	Various : TBD	-	4.551	Dec 2020	5.063	Dec 2021	1.516		-		1.516	Continuing	Continuing	-
		Subtotal	-	10.102		465.685		7.914		-		7.914	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	642.581		583.712		353.658		-		353.658	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604004F / *Advanced Engine Development*	Project (Number/Name) 643608 / *Advanced Engine Dev*	

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

The FY 2023 Budget Justification Exhibit includes a breakout of the FY 2021 through FY 2023 Next Generation Adaptive Propulsion (NGAP) funds from the AETP effort to increase transparency to Congress.

Distribution of FY 2021 funding updated to reflect flow of funds to the Adaptive Engine Transition Program (AETP) to avert cessation of activities while under the FY 2022 continuing resolution authorities.

FY 2022 Adaptive Engine Transition Program (AETP) distributions will be updated to reflect the congressional program increase once congressional concurrence with the spend plan for the funds is obtained. Next Generation Adaptive Propulsion (NGAP) distributions updated to reflect continuation of preliminary design activities under current contracts.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604004F / *Advanced Engine Development*	**Project (Number/Name)** 643608 / *Advanced Engine Dev*

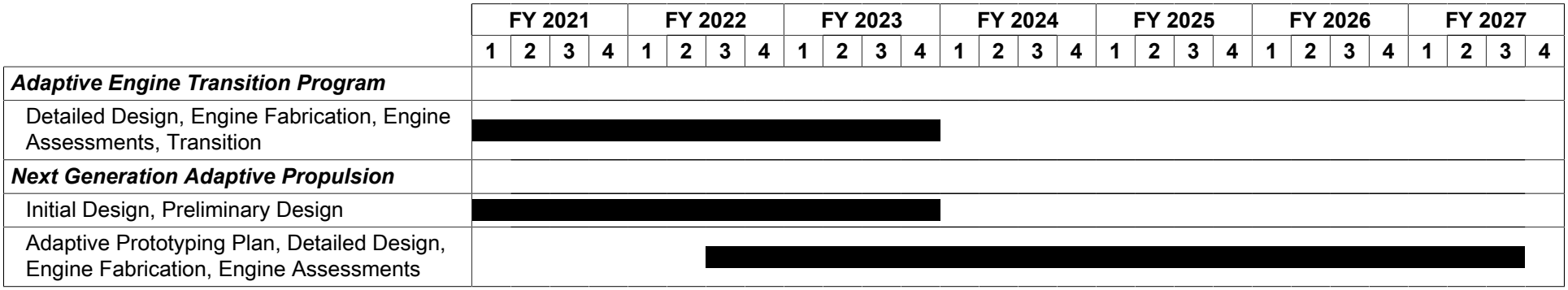

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604004F / *Advanced Engine Development*	**Project (Number/Name)** 643608 / *Advanced Engine Dev*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Adaptive Engine Transition Program				
Detailed Design, Engine Fabrication, Engine Assessments, Transition	1	2021	4	2023
Next Generation Adaptive Propulsion				
Initial Design, Preliminary Design	1	2021	4	2023
Adaptive Prototyping Plan, Detailed Design, Engine Fabrication, Engine Assessments	3	2022	3	2027

Note

The FY 2023 Budget Justification Exhibit includes a breakout of the FY 2021 through FY 2023 Next Generation Adaptive Propulsion (NGAP) funds from the AETP effort to increase transparency to Congress.

The Adaptive Engine Transition Program consists of four phases: detailed design, engine fabrication, engine assessments and transition.

Program deliverables include: military adaptive engine detailed design parameters and models; multiple engine sets of hardware (plus spare parts); matured technologies; major rig assessment data (controls, combustor, etc.); program reviews; and technology, afford-ability, sustainability and integration studies.

The Next Generation Adaptive Propulsion effort consists of six phases initial design, preliminary design, adaptive prototyping planning, detailed design, engine fabrication, and engine assessments.

Program deliverables include: military adaptive engine detailed design parameters and models; engine hardware (plus spare parts); matured technologies; major rig assessment data (controls, combustor, etc.); program reviews; and technology, afford-ability and sustainability studies for Next Generation Air Dominance (NGAD) capabilities.

Initial Design, Preliminary Design end extended to fourth quarter.

Additional details can be provided in the appropriate forum.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0604006F / *Dept of the Air Force Tech Architecture*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	0.000	25.138	66.615	0.000	66.615	78.731	110.313	115.791	134.292	Continuing	Continuing
645352: *Department of the Air Force Technical Architecture Design, Integration, and Evaluation*	-	0.000	25.138	66.615	0.000	66.615	78.731	110.313	115.791	134.292	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

PE 0604006F, Dept of the Air Force Tech Architecture, changed from Architecture Initiatives.

A. Mission Description and Budget Item Justification

The Department of the Air Force (DAF) Tech Architecture resources activities to oversee and shape the technical architecture of the entire Air Force and Space Force and foster modular and agile architectures within individual programs and across programs to rapidly deliver warfighting capability.

Potential adversaries are modernizing faster than anticipated. They are advancing individual systems while bringing families of systems (or systems of systems) together into an architecture to deny U.S. interests and counter potential U.S. action. One such example is the increasingly coupled investments and integration of space, air, and maritime sensing with long-range missile systems. The mix of capabilities and the integration of capabilities are just as important as the individual systems themselves because they have to work together in order to achieve the necessary operational effects and do so on increasingly rapid timelines. Successful companies follow a similar approach across product lines, and the same approach is needed for the DAF. The DAF must not only invest in superior capabilities but also invest in superior architectures that enable those capabilities to integrate and modernize.

First, the DAF needs a technical architecture that enables platforms to leverage modular open subcomponents and to integrate them together to achieve operational mission threads, such as Decision Superiority and Information Advantage, Agile Combat Employment, Rapid All-Domain Kill Chains, Logistics Under Attack, Space Domain Awareness, and Space Defense. The Department does not have an integrated reference architecture, so it should not be a surprise if capabilities do not work together as desired or the technical achievements fail to match the warfighter's desired operational effects. An integrated architecture is necessary and must dynamically mature as threats advance and new technological opportunities arise. This architecture must also ensure that programs and platforms are built with agility via Modular open systems and open standards so that they can adapt and upgrade components quickly in response to threats or opportunities to integrate technology as advances are made. Efforts in this arena often fail to produce the desired results as organizations often stop at the "blueprint" phase or the design phase and fail to move from a great design into mission-ready capabilities on the battlefield.

Second, the DAF needs to rapidly field systems-of-systems to deliver incremental gains in capability while creating the path to scaled deployment and sustainment. The Department of the Air Force does not have a deliberate campaign that integrates technology into the force at the architecture level. Architecture Integration addresses this technology integration challenge, highlights architecture level gaps, and rapidly delivers immediate flexible capability improvements in priority areas in

advance of scaled solutions. By rapidly fielding open solutions, the DAF has uncovered mission-critical gaps that might not have been found at test ranges before being discovered on the road to conflict when it would likely be too late to correct. Therefore, a regular campaign to deliver time-critical technology with a bridge to scaling at the architecture level is critical to deliberately advancing the DAF's technological edge and impact overall architecture design, investments, requirements for future capabilities, and acquisition baseline updates for current systems.

This activity is directed by the DAF Chief Architect Officer with oversight by the Secretary of the Air Force along with the Chief of Staff of the Air Force and Chief of Space Operations. This activity is executed by the Air Force Research Laboratory.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Department of the Air Force Tech Architecture. 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, 0605831F and/or 0604858F. In FY 2022 $2.267 million is forecasted for civilian pay expenses in this program element.

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

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

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.000	82.438	0.000	0.000	0.000
Current President's Budget	0.000	25.138	66.615	0.000	66.615
Total Adjustments	0.000	-57.300	66.615	0.000	66.615
• Congressional General Reductions	0.000	-57.300			
• 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	66.615	0.000	66.615

Change Summary Explanation

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY 2023 cannot be made in a relevant manner.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604006F / *Dept of the Air Force Tech Architecture*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: DAF Architecture Design and Integration	0.000	25.106	66.615

Description: The Department does not have an integrated reference architecture, so it should not be a surprise if capabilities do not work together as desired or the technical achievements fail to match the warfighter's desired operational effects. An integrated architecture is necessary and must dynamically mature as threats advance and new technological opportunities arise. In other words an architecture must play both defense and offense effectively to adapt to these challenges and opportunities. This architecture drives programs and platforms to be built with agility via open systems and open standards so that they can adapt and upgrade components quickly in response to threats or opportunities to integrate technology as advances are made. While having an integrated architecture is uncommon in the Department, it is a standard commercial practice. This architecture focuses on closing these systems and systems-of-systems modularity and integrated capability gaps.

DAF Architecture Design focuses on integration of DAF systems to deliver superior systems-of-systems capabilities addressing multiple warfighting mission scenarios. Design delivers architectures that enable scalability, flexibility, and interoperability through application of open standards and modular open system architectures. Design enables cross-cutting architecture development across the Air and Space Staffs, Program Executive Offices, Major Commands, and Deltas leveraging a collaborative digital environment and architecture repository. Design analyzes architectures to identify technical gaps and assess operational feasibility of new capabilities across science, technology, research, and development enterprises to inform acquisition strategy to maximize system-of-systems lethality.

DAF Architecture Integration gauges opportunities and delivers architecturally-sound, high impact Minimum Viable Product (MVP) capabilities with roadmaps for programs to scale capabilities that warfighters need. This work is a deliberate campaign that integrates capabilities at the force-level (i.e., architecture level). This process also uncovers mission-critical gaps that may not be uncovered at test ranges—meaning they would have been discovered on the road to conflict when it could be too late to correct. Therefore, a regular campaign to deliver time-critical technology with a bridge to scaling at the architecture level is critical to deliberately advancing the DAF's technological edge and impacts overall architecture design, funding priorities among multiple capability areas, investments, requirements for future capabilities, and acquisition baseline updates for both materiel and non-materiel solutions.

FY 2022 Plans:
Continue to capitalize on DAF Architecture Design activities previously accomplished, to include objectives such as: (1) design technical architectures to enable Department of the Air Force Service Chiefs' cross-cutting priority missions, including Decision Superiority and Information Advantage, Agile Combat Employment, Distributed Operations, and Layered Defense, and Rapid All-domain Kill Chains; (2) design and develop functional cross-cutting architectures such as an enterprise data architecture and associated infrastructure; (3) foster and mature accessible open architecture and standards to enable program agility and

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604006F / *Dept of the Air Force Tech Architecture*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
adaptability; (4) develop foundational cloud-based digital models of Air Force and Space Force platforms across classification levels; and (5) help drive current and future programs towards the architecture through program objective investments and acquisition program modernization. ***FY 2023 Plans:*** Continue DAF Architecture Design and Integration activities with focus on: (1) the DAF government reference architecture standards and governance within a Digital Architecture Enterprise Cloud Environment that enables programs to transition to DAF-wide technical architectures; (2) Architecture Minimum Viable Product (MVP) for Decision Superiority and Information Advantage inserting Operational Artificial Intelligence to drive global information exchange across regional commander boundaries in the face of contested operations; (3) Architecture MVP for Agile Combat Employment, Distributed Operations, and Layered Defense; (4) Expanded architecture for data infrastructure that includes structured, unstructured, and streaming data enabled through open source interfaces; (5) Integrated Warfighter Network architecture for classified networking and encrypted connectivity for seamless operation and connectivity whether on base or deployed in combat; (6) Identify needed changes to architectures and architecture-driven requirements for modernization programs. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 funding increased compared to FY 2022 by $41.509 million. Funding increased due to increased demand for mission and functional architectures to support Secretary of the Air Force requirements.			
Title: DAF Architecture Force Integration	0.000	0.032	0.000
Description: Description: Department of the Air Force (DAF) Architecture Demonstration and Evaluation demonstrates and evaluates the integration of capabilities, not just individual capabilities. This work is a deliberate campaign that integrates demonstration and evaluation at the force-level (i.e., architecture level). This is critical because great designs on paper may not have traction when meeting reality, and traditional system-level testing and experimentation are not designed to yield insights into the effectiveness of capabilities working together to achieve integrated mission effects. By taking Architecture Demonstrations and Evaluations to the field, the DAF also uncovers mission-critical gaps that may not be uncovered at test ranges—meaning they would have been discovered on the road to conflict when it could be too late to correct. Therefore, a regular campaign of learning at the architecture level with demonstration and evaluation of how and where the Department of the Air Force fights is critical to moving from simply buying systems and hoping they compose into a family of systems in conflict to a deliberate approach that impacts overall architecture design, investments, requirements for future capabilities, and acquisition baseline updates for current systems. The DAF Architecture Demonstration and Evaluation effort focuses on addressing these needs. The DAF Architecture Demonstration and Evaluation pillar enables and conducts architecture-level demonstration and testing throughout the year and specifically at capstone Architecture Evaluations at key points to evaluate the integrated mission-oriented and functional-oriented architectures. These events further evaluate agility by adjusting operational scenarios from technical sprint to technical sprint to better reflect the uncertainty that a potential conflict might bring. The live demonstrations also enable focused			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604006F / *Dept of the Air Force Tech Architecture*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
objectives for integration with the joint force, allies, and partners and lower barriers to transition prototypes into operational programs. The Architecture Evaluations approach is modeled after modern commercial industry best practices and elements of the Special Operations community. This line of effort also includes costs for architecture evaluation infrastructure, test personnel, range access, consumables, travel, operational concept and non-materiel development, technical sprints to solve near-term gaps, and other evaluation-specific activities. The necessity of conducting evaluations at the architecture level and the speed required by the operational needs compel enhanced approaches to traditional test and analysis capabilities, namely new, innovative, and sufficiently-resourced test and analysis infrastructure, networks, and core subject matter expertise to include employment of military, civilian, reserve, and contractor capabilities. ***FY 2022 Plans:*** FY 2022 plans capitalize on DAF Architecture Demonstration and Evaluation activities previously accomplished within individual programs and will include objectives such as: (1) demonstrate and evaluate technical architecture designs to enable Department of the Air Force Service Chiefs' cross-cutting priority missions, including Decision Superiority and Information Advantage, Agile Combat Employment, Distributed Operations, and Layered Defense, and Rapid All-domain Kill Chains as well as functional architectures such as enterprise data capabilities; (2) identify needed changes to architectures and architecture-driven requirements for modernization programs and program objective budget investments; (3) solve select "quick win" technical gaps identified as part of the evaluations; (4) assess the military utility of technology solutions to achieve the Department of the Air Force architecture designs; and (5) enhance evaluation infrastructure at test locations and augment relocatable test capabilities to enable Continental United States and Outside the Continental United States evaluations. ***FY 2023 Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 funding decreased compared to FY 2022 by $0.032 million. Funding decreased due to increased demand for design and integration of mission and functional architectures to support Secretary of the Air Force requirements.			
Accomplishments/Planned Programs Subtotals	0.000	25.138	66.615

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Due to the Congressional marks in the Architecture Demonstration and Evaluation thrust identified in the enacted FY2022 President's Budget (PB), the Chief Architect's Office (CAO) will not be able to execute the FY 2022 plans as stated above. The CAO will transition all work to Architecture Design and Integration thrust in FY 2022 and beyond.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604006F / *Dept of the Air Force Tech Architecture*

E. Acquisition Strategy

Contracting strategies vary based on activity; please see R3 for additional details.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604006F / *Dept of the Air Force Tech Architecture*	**Project (Number/Name)** 645352 / *Department of the Air Force Technical Architecture Design, Integration, and Evaluation*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DAF Architecture Design	Various	RAFT SBIR PhIII : Reston, VA	-	-		3.780	Jun 2022	-		-		-	Continuing	Continuing	-
DAF Architecture Design and Integration Contract 1	MIPR	BAH : McLean, VA	-	-		1.660	Nov 2021	2.200	Jan 2023	-		2.200	Continuing	Continuing	-
DAF Architecture Design and Integration Contract 2	MIPR	MIT/LL : Lexington, MA	-	-		0.000	Nov 2021	2.740	Jan 2023	-		2.740	Continuing	Continuing	-
DAF Architecture Modeling and Analysis Contract 1	MIPR	GTRI, MITRE, MIT/LL, Aero : Various	-	-		2.900	Nov 2021	2.525	Nov 2022	-		2.525	Continuing	Continuing	-
DAF Architecture Modeling and Analysis Contract 2	MIPR	JHU APL : Laurel, MD	-	-		3.690	Nov 2021	9.546	Nov 2022	-		9.546	Continuing	Continuing	-
DAF Architecture Modeling and Analysis Infrastructure	Various	Various : Various	-	-		0.055	Nov 2021	1.500	Dec 2022	-		1.500	Continuing	Continuing	-
DAF Architecture Technology Solutions, FY22-23	Various	Various : Various	-	-		1.313	Dec 2021	10.060	Jan 2023	-		10.060	Continuing	Continuing	-
DAF Mission Architecture	MIPR	GTRI, SEI : Various	-	-		0.852	Dec 2021	6.642	Dec 2022	-		6.642	Continuing	Continuing	-
DAF Program Architecture	MIPR	GTRI, APL, SEI : Various	-	-		0.000	Dec 2021	3.413	Dec 2022	-		3.413	Continuing	Continuing	-
DAF Architecture Integration	MIPR	MITRE : McLean, VA	-	-		0.800	Mar 2022	0.450	Oct 2022	-		0.450	Continuing	Continuing	-
		Subtotal	-	-		15.050		39.076		-		39.076	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DAF Architecture Initiatives Support	MIPR	BAH/SEI : Various	-	-		0.319	Nov 2021	1.150	Dec 2022	-		1.150	Continuing	Continuing	-
DAF Architecture Engineering Support	Reqn	AFRL : Various	-	-		0.000	Oct 2021	0.000	Oct 2022	-		0.000	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604006F / *Dept of the Air Force Tech Architecture*	**Project (Number/Name)** 645352 / *Department of the Air Force Technical Architecture Design, Integration, and Evaluation*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	-		0.319		1.150		-		1.150	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DAF Architecture Design Test	Various	LL; APL; MITRE; GTRI; BAH : Various	-	-		2.332	Dec 2021	3.040	Oct 2022	-		3.040	Continuing	Continuing	-
DAF Architecture Execution Team 1	MIPR	Booz Allen Hamilton : McLean, VA	-	-		3.196	Oct 2021	4.000	Nov 2022	-		4.000	Continuing	Continuing	-
DAF Architecture Mission Execution	Various	Various : Various	-	-		0.270	Dec 2021	1.500	Dec 2022	-		1.500	Continuing	Continuing	-
DAF Architecture Test Infrastructure	Various	Various : Various	-	-		0.000	Dec 2021	2.000	Dec 2022	-		2.000	Continuing	Continuing	-
		Subtotal	-	-		5.798		10.540		-		10.540	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Administration	Various	Various : Various	-	-		3.971	Oct 2021	15.849	Oct 2022	-		15.849	Continuing	Continuing	-
		Subtotal	-	-		3.971		15.849		-		15.849	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		25.138		66.615		-		66.615	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604006F / *Dept of the Air Force Tech Architecture*	**Project (Number/Name)** 645352 / *Department of the Air Force Technical Architecture Design, Integration, and Evaluation*

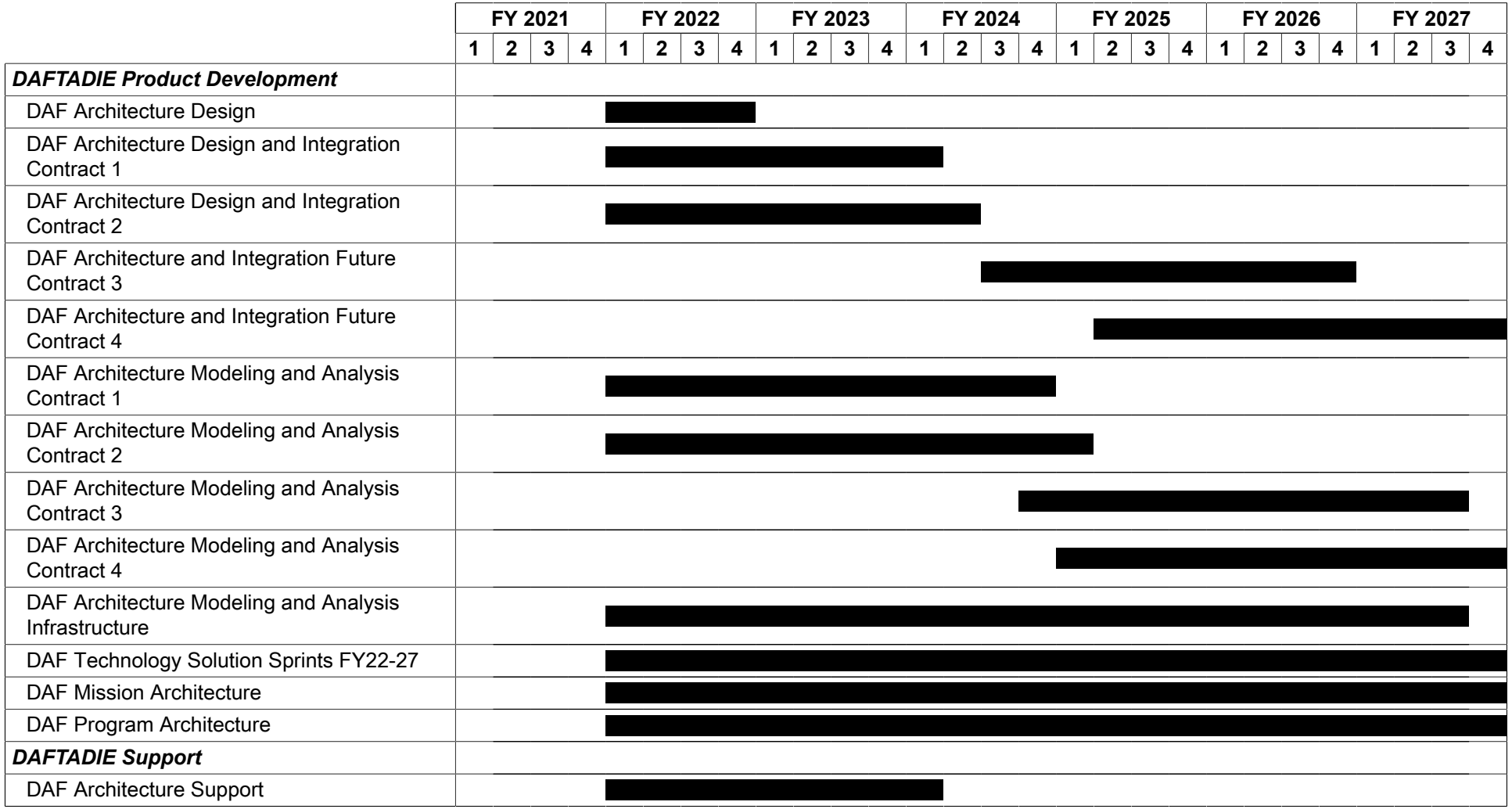

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604006F / *Dept of the Air Force Tech Architecture*	**Project (Number/Name)** 645352 / *Department of the Air Force Technical Architecture Design, Integration, and Evaluation*

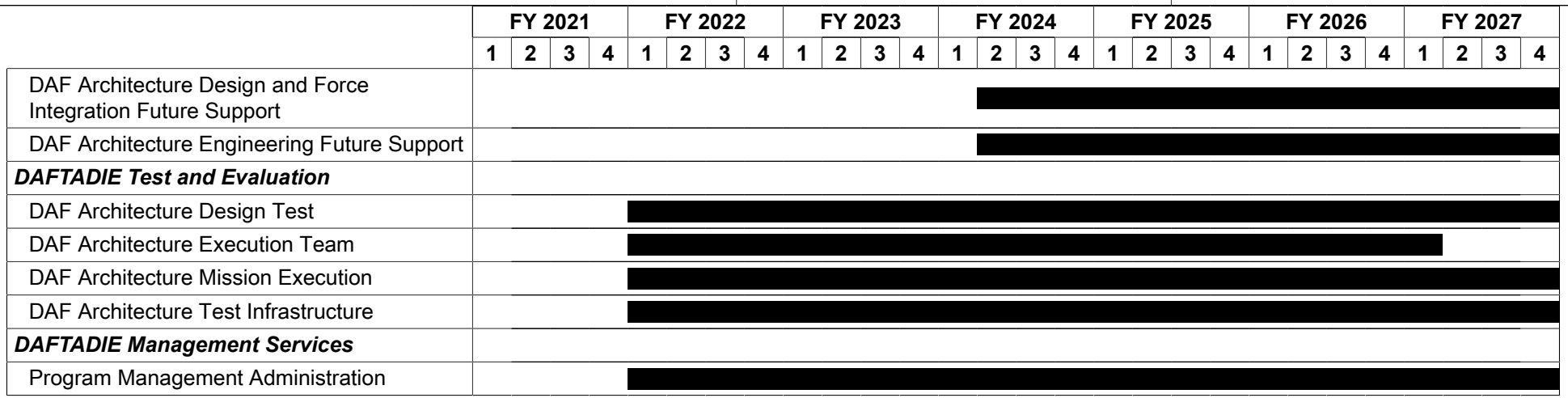

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604006F / *Dept of the Air Force Tech Architecture*	**Project (Number/Name)** 645352 / *Department of the Air Force Technical Architecture Design, Integration, and Evaluation*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
DAFTADIE Product Development				
DAF Architecture Design	1	2022	4	2022
DAF Architecture Design and Integration Contract 1	1	2022	1	2024
DAF Architecture Design and Integration Contract 2	1	2022	2	2024
DAF Architecture and Integration Future Contract 3	3	2024	4	2026
DAF Architecture and Integration Future Contract 4	2	2025	4	2027
DAF Architecture Modeling and Analysis Contract 1	1	2022	4	2024
DAF Architecture Modeling and Analysis Contract 2	1	2022	1	2025
DAF Architecture Modeling and Analysis Contract 3	4	2024	3	2027
DAF Architecture Modeling and Analysis Contract 4	1	2025	4	2027
DAF Architecture Modeling and Analysis Infrastructure	1	2022	3	2027
DAF Technology Solution Sprints FY22-27	1	2022	4	2027
DAF Mission Architecture	1	2022	4	2027
DAF Program Architecture	1	2022	4	2027
DAFTADIE Support				
DAF Architecture Support	1	2022	1	2024
DAF Architecture Design and Force Integration Future Support	2	2024	4	2027
DAF Architecture Engineering Future Support	2	2024	4	2027
DAFTADIE Test and Evaluation				
DAF Architecture Design Test	1	2022	4	2027
DAF Architecture Execution Team	1	2022	1	2027

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604006F / *Dept of the Air Force Tech A rchitecture*	**Project (Number/Name)** 645352 / *Department of the Air Force Technical Architecture Design, Integration, and Evaluation*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
DAF Architecture Mission Execution	1	2022	4	2027
DAF Architecture Test Infrastructure	1	2022	4	2027
DAFTADIE Management Services				
Program Management Administration	1	2022	4	2027

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604015F / *Long Range Strike - Bomber*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	2,744.473	2,872.624	3,253.584	0.000	3,253.584	2,322.076	1,707.696	1,527.043	1,261.732	Continuing	Continuing
643308: *Long Range Strike Bomber*	-	2,744.473	2,872.624	3,253.584	0.000	3,253.584	2,322.076	1,707.696	1,527.043	1,261.732	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress. For further information, please contact the Director of Special Programs, OUSD(A&S)/DSP.

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

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	2,843.214	2,872.624	0.000	0.000	0.000
Current President's Budget	2,744.473	2,872.624	3,253.584	0.000	3,253.584
Total Adjustments	-98.741	0.000	3,253.584	0.000	3,253.584
• 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	-98.741	0.000			
• Other Adjustments	0.000	0.000	3,253.584	0.000	3,253.584

Change Summary Explanation

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress. For further information, please contact the Director of Special Programs, OUSD(A&S)/DSP.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Long Range Strike Bomber	2,744.473	2,872.624	3,253.584
Description: Long Range Strike Bomber			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604015F / *Long Range Strike - Bomber*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY 2022 Plans: Program continuation in 2022. This program is reported in accordance with Title 10, USC, Section 119(a)(1) in the Special Access Program Annual Report to Congress. For further information, please contact the Director of Special Programs, OUSD(A&S)/DSP. ***FY 2023 Plans:*** Program continuation in 2023. This program is reported in accordance with Title 10, USC, Section 119(a)(1) in the Special Access Program Annual Report to Congress. For further information, please contact the Director of Special Programs, OUSD(A&S)/DSP. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** This program is reported in accordance with Title 10, USC, Section 119(a)(1) in the Special Access Program Annual Report to Congress. For further information, please contact the Director of Special Programs, OUSD(A&S)/DSP.			
Accomplishments/Planned Programs Subtotals	2,744.473	2,872.624	3,253.584

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• MILCON PE 0604015: *Long Range Strike Bomber*	10.000	343.000	168.000	-	168.000	39.749	227.362	323.415	351.850	Continuing	Continuing

Remarks

E. Acquisition Strategy

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress. For further information, please contact the Director of Special Programs, OUSD(A&S)/DSP.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604015F / *Long Range Strike - Bomber*	Project (Number/Name) 643308 / *Long Range Strike Bomber*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Actual breakout provided in Special Access Program Annual Report to Congress	Various	N/A : FL	-	2,744.473		2,872.624		3,253.584		-		3,253.584	Continuing	Continuing	-
Subtotal			-	2,744.473		2,872.624		3,253.584		-		3,253.584	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	2,744.473		2,872.624		3,253.584		-		3,253.584	Continuing	Continuing	N/A

Remarks

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress. For further information, please contact the Director of Special Programs, OUSD(A&S)/DSP.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604015F / *Long Range Strike - Bomber*	**Project (Number/Name)** 643308 / *Long Range Strike Bomber*

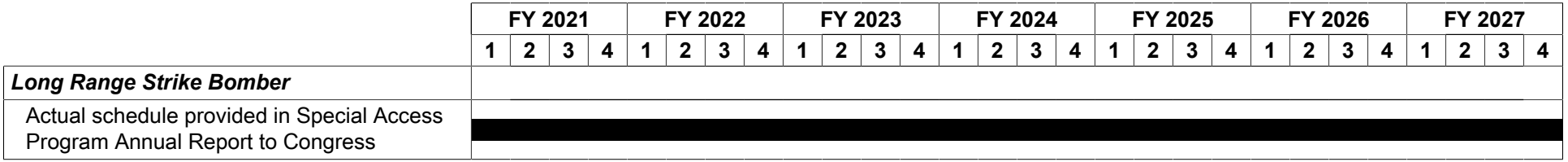

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604015F / *Long Range Strike - Bomber*	**Project (Number/Name)** 643308 / *Long Range Strike Bomber*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Long Range Strike Bomber				
Actual schedule provided in Special Access Program Annual Report to Congress	1	2021	4	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0604032F / *Directed Energy Prototyping*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	19.023	15.820	4.269	0.000	4.269	4.080	4.082	4.168	4.260	0.000	55.702
640200: *DE Prototyping*	-	19.023	15.820	4.269	0.000	4.269	4.080	4.082	4.168	4.260	0.000	55.702
Quantity of RDT&E Articles	-	4	1	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Air Force Life Cycle Management Center, Architecture and Integration Directorate Directed Energy Prototyping Program acquires and evaluates prototype high energy laser, high power microwave and/or other electromagnetic radiation or particle beam technologies as a future integral component of the Airbase defense mission. The Directed Energy Prototyping Program bridges the gap between lab based technology demonstration under a controlled environment, and demonstration of a system in realistic environments with the intent of establishing successful acquisition, and operation or operational capability implementation.

This prototyping effort enables the ability to integrate the directed energy prototype systems with other operational systems required for the mission (e.g. radar, command and control, etc.), conduct test and evaluation activities, and mature emerging directed energy technology systems based on prototyping activities to enable rapid fielding to the warfighter. The Directed Energy Prototyping Program allows acquisition program managers (capability developers) and warfighters (capability recipients and end users) to prototype, integrate, evaluate, and demonstrate candidate weapon technologies and assess them in an operational environment with the intent of iteratively maturing directed energy technologies to a production representative design.

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 Prior Years $0.852M was expended for civilian pay expenses in this program element, and in CY22 $0.973M is forecasted for civilian pay expenses in this program element.

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604032F / *Directed Energy Prototyping*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	19.429	10.820	0.000	0.000	0.000
Current President's Budget	19.023	15.820	4.269	0.000	4.269
Total Adjustments	-0.406	5.000	4.269	0.000	4.269
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	5.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.406	0.000			
• Other Adjustments	0.000	0.000	4.269	0.000	4.269

Change Summary Explanation

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

Decrease in FY 2021 reflects reprogramming to support Prototyping & Technology Development Projects, 10 U.S.C. Section 2363, an amendment to PL 110-417, 10 U.S.C. Section 2358 and 10 U.S.C. 2805(d)(1)(B)

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Directed Energy Capabilities	19.023	15.820	4.269

Description: Prototypes and evaluates Directed energy weapon technologies for Airbase Defense against unmanned aerial vehicles and cruise missiles, Precision Strike against electronic and conventional targets and Aircraft Defense against incoming threats.

FY 2022 Plans:

Continue to test and evaluate acquired Directed Energy Counter-small Unmanned Ariel System prototype-systems to determine system capability and field effectiveness of this next generation of prototypes. Results from government field assessment will be used to support future fielding/Program of Record decisions. The effort will initiate another round of Counter-small Unmanned Ariel System technology maturation based on information gleaned from previous efforts.

FY 2023 Plans:

Iterate the FY22 plans for integrating the recent maturation efforts into prototypes and then follow up with government capability/ field effectiveness testing. The prototyping office will continue to work with Air Force futures, the Joint counter small Unmanned Ariel System Office, and others to refine requirements and architecture for defense of critical infrastructure and base defense. The

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604032F / *Directed Energy Prototyping*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
prototyping office will work with major/combatant commands to identify paths to incorporate new directed energy prototypes into integration/testing during their exercises. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 decreased compared to FY 2022 by $11.551 million because this investment meets the requirement to provide Directed Energy prototypes to counter small UAS.			
Accomplishments/Planned Programs Subtotals	19.023	15.820	4.269

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Not Applicable

E. Acquisition Strategy

During FY 2020, the Air Force Life Cycle Management Center, Architecture and Integration Directorate, Wright-Patterson Air Force Base, Ohio conducted a source selection evaluating eight (8) ground-based Counter Unmanned Aerial Systems for prototype development. In 4QFY20, three (3) vendors were selected for award using Other Transaction Authority based on a best value determination with Technical being the most important factor. During FY21, these three (3) prototypes will be evaluated and potentially down-selected at specific testing gates based on operational capability/suitability assessment supporting the Airbase defense mission. After acceptance testing and characterization testing is complete in FY 2022, the prototypes will be iterated toward a production representative article. An acquisition readiness assessment will be made while documenting design, sustainment, and initial operational concepts of operation information to support a future milestone decision regarding program of record status.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604032F / *Directed Energy Prototyping*	Project (Number/Name) 640200 / *DE Prototyping*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
High Energy Laser Prototypes	C/FFP	Various : Various	-	6.872	Mar 2021	6.800	Mar 2022	-		-		-	Continuing	Continuing	-
High Power Microwave Development	C/CPAF	Not specified. : Various	-	6.000	Jun 2021	4.395	Jul 2022	1.000	Jun 2023	-		1.000	Continuing	Continuing	-
		Subtotal	-	12.872		11.195		1.000		-		1.000	Continuing	Continuing	N/A

Remarks

Other Transactions Authorities used for High Energy Laser Prototype contracts.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Directed Energy C-UAS Prototype Technical Maturation and Improvements	Various	Various : Various	-	4.940	May 2021	2.697	Apr 2022	2.000	Apr 2023	-		2.000	Continuing	Continuing	-
		Subtotal	-	4.940		2.697		2.000		-		2.000	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Directed Energy Prototyping Program Administration	Various	AFLCMC : Various	-	0.359	Oct 2020	1.000	Oct 2021	0.419	Oct 2022	-		0.419	Continuing	Continuing	-
Direct Cite Authority	TBD	AFLCMC : Various	-	0.852	Oct 2020	0.928	Oct 2021	0.850	Oct 2022	-		0.850	Continuing	Continuing	-
		Subtotal	-	1.211		1.928		1.269		-		1.269	Continuing	Continuing	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	19.023		15.820		4.269		-		4.269	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604032F / *Directed Energy Prototyping*	Project (Number/Name) 640200 / *DE Prototyping*	

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

FY 2022 - FY 2026 will concentrate on prototyping and maturing high energy laser and high power microwave systems for base area defense in preparation for transition to program of record. The program makes use of Other Transactional Authorities (OTA). Continued support will be provided by the Directed Energy Transition Management Office, Kirtland Air Force Base, New Mexico.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604032F / *Directed Energy Prototyping*	**Project (Number/Name)** 640200 / *DE Prototyping*

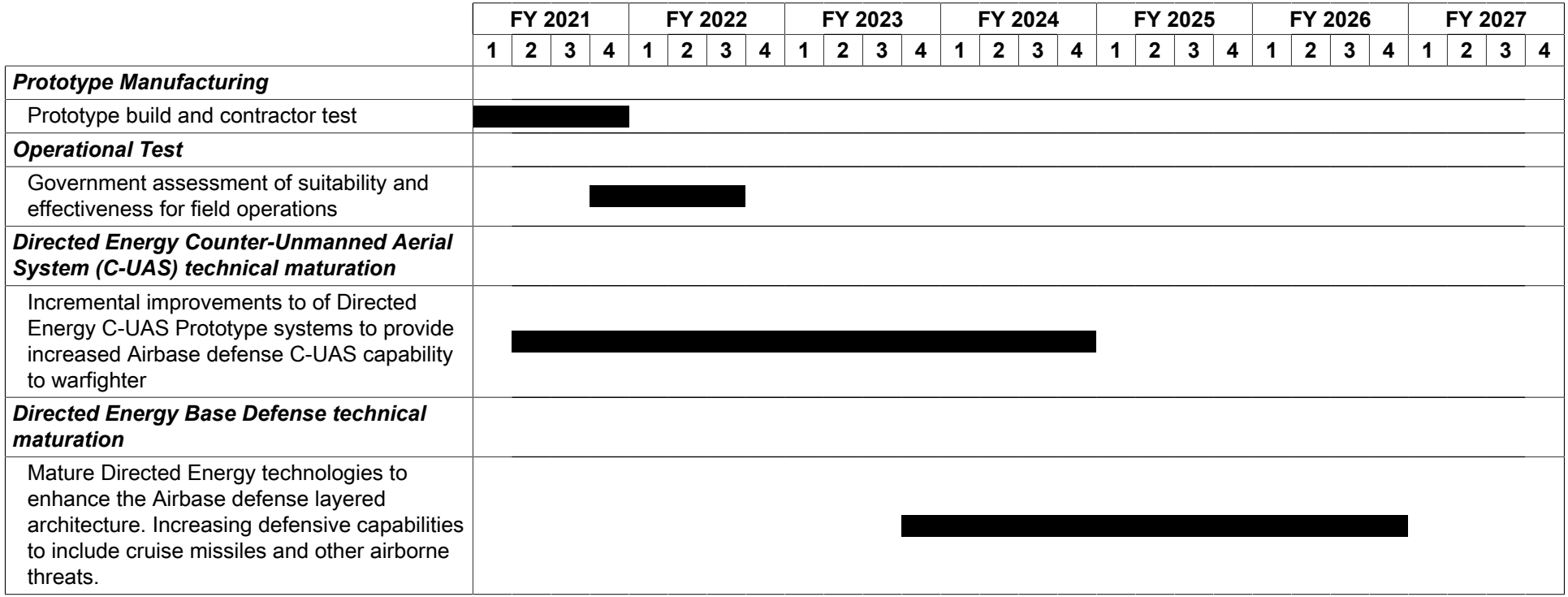

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604032F / *Directed Energy Prototyping*	**Project (Number/Name)** 640200 / *DE Prototyping*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Prototype Manufacturing				
Prototype build and contractor test	1	2021	4	2021
Operational Test				
Government assessment of suitability and effectiveness for field operations	4	2021	3	2022
Directed Energy Counter-Unmanned Aerial System (C-UAS) technical maturation				
Incremental improvements to of Directed Energy C-UAS Prototype systems to provide increased Airbase defense C-UAS capability to warfighter	2	2021	4	2024
Directed Energy Base Defense technical maturation				
Mature Directed Energy technologies to enhance the Airbase defense layered architecture. Increasing defensive capabilities to include cruise missiles and other airborne threats.	4	2023	4	2026

Note

FY 2022 - FY 2026 will concentrate on maturing high energy laser and high power microwave systems for base area defense in preparation for transition of prototype weapon systems to program(s) of record. The program makes use of Other Transactional Authorities (OTA). Continued support will be provided by the Directed Energy Transition Management Office, Kirtland Air Force Base, New Mexico.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0604033F / *Hypersonics Prototyping*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	374.426	318.687	431.868	0.000	431.868	270.240	305.602	237.367	105.990	0.000	2,044.180
643882: *Air-Launched Rapid Response Weapon (ARRW)*	-	374.426	318.687	114.981	0.000	114.981	0.000	0.000	0.000	0.000	0.000	808.094
643883: *Hypersonic Attack Cruise Missile*	-	0.000	0.000	316.887	0.000	316.887	270.240	305.602	237.367	105.990	0.000	1,236.086

Note

In FY 2022, PE 0101101F, Project ARRW00/AGM-183A Air-Launched Rapid Response Weapon, efforts were transferred to PE 0604033F, Hypersonics Prototyping, Project 643882, Air-Launched Rapid Response Weapon, in order to mitigate the testing shortfall.

A. Mission Description and Budget Item Justification

The Hypersonics Prototyping program enables integration and demonstration of emerging hypersonic technologies in an operational or operational-like environment to capitalize on successful laboratory hypersonic research and development efforts with high warfighter priority. Integration and demonstration of hypersonic prototypes also allows leadership to make informed strategy and resource decisions for future programs based on the results of such hypersonic prototype demonstrations.

Hypersonic Prototyping enables a key linkage between research and development in the lab and fielding advanced technologies to the warfighter. Under this program, Air-Launched Rapid Response Weapon (ARRW) and the Hypersonic Attack Cruise Missile (HACM) will accelerate the technology transfer of hypersonic technologies to enable a responsive, long range strike capability.

Throughout this program element will be future hypersonics development, which will incubate and mature new technologies, processes, and resources for the development and demonstration of hypersonic technology including, but not limited to, infrastructure advancements, digital engineering, open systems architecture, modeling and simulation, analytics, and high performance computing environments.

The total cost of the ARRW Rapid Prototyping Middle Tier of Acquisition effort is $1,568.682 million, including RDT&E and procurement of prototype units. ARRW 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 programs funds would be in addition to the civilian pay expenses budgeted in program element 0605827F, 0605828F, 0605829F, 0605831F, 0605832F, 0605833F, 0605898F, 0606398F. In FY 2021 $3.536 million was expended for civilian pay expenses in this program element, and in FY 2022 $4.222 million is forecasted for civilian pay expenses in this program element.

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604033F / *Hypersonics Prototyping*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	386.157	438.378	0.000	0.000	0.000
Current President's Budget	374.426	318.687	431.868	0.000	431.868
Total Adjustments	-11.731	-119.691	431.868	0.000	431.868
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-200.116			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	80.425			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-11.731	0.000			
• Other Adjustments	0.000	0.000	431.868	0.000	431.868

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Project: 643882: *Air-Launched Rapid Response Weapon (ARRW)*		
Congressional Add: *Program increase - Air-launched rapid response weapon*	5.000	0.000
Congressional Add Subtotals for Project: 643882	5.000	0.000
Congressional Add Totals for all Projects	5.000	0.000

Change Summary Explanation

In FY 2022, $190.116 million was transferred from PE 0604033F Project 643883 (HACM) to establish new HACM PE 64183F, Project 644183 (HACM). Additionally, $80.425M from PE 0101101F, Project ARRW00/AGM-183A Air-Launched Rapid Response Weapon, efforts were transferred to PE 0604033F, Hypersonics Prototyping, Project 643882, Air-Launched Rapid Response Weapon, in order to mitigate the testing shortfall.

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY 2023 cannot be made in a relevant manner.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604033F / *Hypersonics Prototyping*	Project (Number/Name) 643882 / *Air-Launched Rapid Response Weapon (ARRW)*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
643882: *Air-Launched Rapid Response Weapon (ARRW)*	-	374.426	318.687	114.981	0.000	114.981	0.000	0.000	0.000	0.000	0.000	808.094
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Air-Launched Rapid Response Weapon (ARRW) project integrates Air Force and DARPA enabled system technologies into a prototype that will demonstrate the viability of this concept to be fielded as a long range prompt strike capability. ARRW will design, develop, manufacture, and test, a number of prototype vehicles to inform decisions concerning ARRW acquisition and production.

Future hypersonics development will incubate and mature new technology, processes, and resources for the development and demonstration of hypersonic technology including, but not limited to, infrastructure advancements, digital engineering, open systems architecture, modeling and simulation, analytics, and high performance computing environments.

In FY 2022, PE 0101101F, Project ARRW00/AGM-183A Air-Launched Rapid Response Weapon, efforts were transferred to PE 0604033F, Hypersonics Prototyping, Project 643882, Air-Launched Rapid Response Weapon, in order to mitigate the testing shortfall.

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 FY 2021 $3.536 million was expended for civilian pay expenses in this program element, and in FY 2022 $4.222 million is forecasted for civilian pay expenses in this program element.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Air Launched Rapid Response Weapon (ARRW)	369.426	318.687	114.981	0.000	114.981
Description: Integrates Air Force and DARPA enabled system technologies into a prototype that will demonstrate the viability of this concept to be fielded as a long range prompt strike capability. ARRW will design, develop, manufacture, and test, a number of prototype vehicles to inform decisions concerning ARRW acquisition and production.					
FY 2022 Plans: Continue manufacture and flight test of AUR test missiles and prepare for early operational capability.					
FY 2023 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604033F / *Hypersonics Prototyping*	**Project (Number/Name)** 643882 / *Air-Launched Rapid Response Weapon (ARRW)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Complete flight test of AUR test missiles, prepare for transition to production and conduct contract closeout. ***FY 2023 OCO Plans:*** Not Applicable ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 funding decreased compared to FY 2022 by $203.706 million due to program ramping down to MTA completion					
Accomplishments/Planned Programs Subtotals	369.426	318.687	114.981	0.000	114.981

	FY 2021	FY 2022
Congressional Add: Program increase - Air-launched rapid response weapon	5.000	0.000
FY 2021 Accomplishments: Conducted congressionally directed efforts to improve critical technology supplier base. ***FY 2022 Plans:*** Not Applicable		
Congressional Adds Subtotals	5.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• MPAF 02 0101101F: *N/A*	0.000	0.000	46.566	0.000	46.566	0.000	0.000	0.000	0.000	0.000	46.566

Remarks

Program office may require temporary relocatable structures for expansion to support workforce and meet mission requirements.

D. Acquisition Strategy

Acquisition Decision Memorandum (signed 3 May 2018) designated Air-Launched Rapid Response Weapon (ARRW) as Section 804 Rapid Prototyping Program.

The Air Force awarded in August 2018 an undefinitized contract in order to complete a critical design review and procure all long lead parts and materials. The ARRW Program definitized this contract December 2019 to include the entire RDT&E effort (through the end of flight test). The cost type contract includes schedule incentives. The government agency responsible for managing this program is the Air Force Life Cycle Management Center, Armament Directorate, Eglin AFB, FL.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604033F / *Hypersonics Prototyping*	**Project (Number/Name)** 643882 / *Air-Launched Rapid Response Weapon (ARRW)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ARRW - Contract	C/CPFF	LMCO: Various : Various	-	324.596	Feb 2021	249.825	Feb 2022	43.076	Dec 2022	-		43.076	0.000	617.497	-
ARRW - Mission Planning	C/CPFF	Boeing: Tapestry : TBD	-	1.026	Mar 2021	0.801	Mar 2022	0.856	Dec 2022	-		0.856	0.000	2.683	-
ARRW - Aircraft Integration	Various	Various : Various	-	11.617	Dec 2020	7.962	Jan 2022	0.640	Dec 2022	-		0.640	0.000	20.219	-
Congressional Add	TBD	TBD : TBD	-	5.000	Jun 2021	-		-		-		-	0.000	5.000	-
		Subtotal	-	342.239		258.588		44.572		-		44.572	0.000	645.399	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Direct Cite Authority Civilian Pay	Allot	Not specified. : TBD	-	3.536	Oct 2020	4.222	Oct 2021	4.332	Oct 2022	-		4.332	0.000	12.090	-
		Subtotal	-	3.536		4.222		4.332		-		4.332	0.000	12.090	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ARRW - Government Test	Various	Various : TBD	-	20.239	May 2021	44.833	May 2022	56.200	Dec 2022	-		56.200	0.000	121.272	-
		Subtotal	-	20.239		44.833		56.200		-		56.200	0.000	121.272	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ARRW - Program Management Administration	Various	Multiple : TBD	-	8.412	Sep 2021	11.044	Sep 2022	9.877	Oct 2022	-		9.877	0.000	29.333	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604033F / *Hypersonics Prototyping*	**Project (Number/Name)** 643882 / *Air-Launched Rapid Response Weapon (ARRW)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			-	8.412		11.044		9.877		-		9.877	0.000	29.333	N/A

Remarks

Includes A&AS support requirements plus TDY, and office supplies.

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	374.426		318.687		114.981		-		114.981	0.000	808.094	N/A

Remarks

Additional details on Hypersonics prototyping concepts can be provided in the appropriate forum.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604033F / *Hypersonics Prototyping*	**Project (Number/Name)** 643882 / *Air-Launched Rapid Response Weapon (ARRW)*

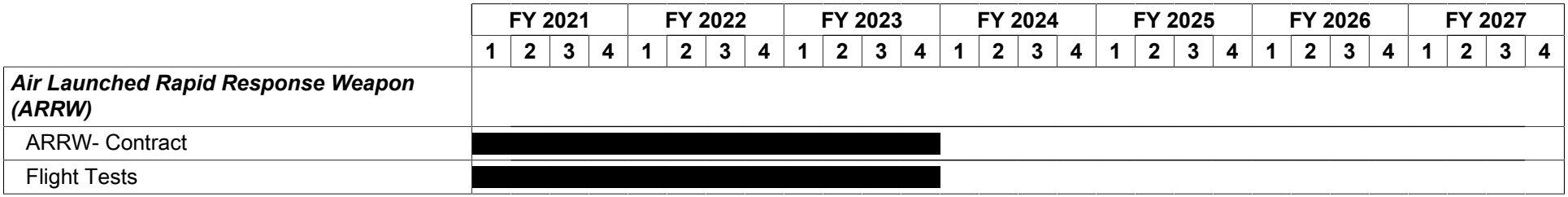

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604033F / *Hypersonics Prototyping*	**Project (Number/Name)** 643882 / *Air-Launched Rapid Response Weapon (ARRW)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Air Launched Rapid Response Weapon (ARRW)				
ARRW- Contract	1	2021	4	2023
Flight Tests	1	2021	4	2023

Note

Further schedule details can be provided in the appropriate forum.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604033F / *Hypersonics Prototyping*	Project (Number/Name) 643883 / *Hypersonic Attack Cruise Missile*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
643883: *Hypersonic Attack Cruise Missile*	-	0.000	0.000	316.887	0.000	316.887	270.240	305.602	237.367	105.990	0.000	1,236.086
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Hypersonic Attack Cruise Missile (HACM) integrates advanced technologies and mature designs into an All-Up Round (AUR) prototype and will demonstrate a fieldable long range prompt strike capability. HACM will design, develop, manufacture, and test a number of prototype vehicles to inform future HACM acquisition decisions.

HACM will mature hypersonic technologies, processes, and resources to include: subsystem integration, infrastructure and testing advancements, digital engineering, open systems architecture, modeling and simulation, analytics, and high performance computing environments.

HACM is currently listed under both this PE 64033F/BPAC 643883 and PE 64183F/BPAC 644183 and will be consolidated to PE 64183F/BPAC 644183 during the next budget update.

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 FY 2021 $0.000 million was expended for civilian pay expenses in this program element, and in FY 2022 $2.360 million is forecasted for civilian pay expenses in this program element.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: HACM Development	0.000	0.000	256.577	-	256.577
Description: Three industry performers purchasing hardware and developing a preliminary design. Followed by a single performer purchasing hardware and completing a critical design, and initial long-lead flight test asset hardware, to include aircraft integration assets. ***FY 2022 Plans:*** This effort consists of HACM requirements development, hardware purchases, trade studies and preliminary design maturation using a model-based Digital Engineering (DE) ecosystem. The effort also includes the incorporation of Air Force enabled technologies into the design, evaluation of system performance, applying a Weapon Open System Architecture (WOSA) standard and program planning. ***FY 2023 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604033F / *Hypersonics Prototyping*	**Project (Number/Name)** 643883 / *Hypersonic Attack Cruise Missile*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Effort will utilize a single industry performer to build upon preliminary design activities and mature HACM to critical design. The effort will continue model-based engineering activities and the DE ecosystem to complete critical design analysis, design verification testing, systems integration, lab development, initial qualification testing, initial flight test hardware orders, aircraft integration assets, and WOSA compliance evaluation. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 funding increased compared to FY 2022 by $256.577 million. Funding increased due to the completion of PDR in FY 2022, advancement to CDR in FY 2023, and initial flight test hardware orders.					
Title: Integration, Qualification and Test ***Description:*** This effort includes the government costs associated to assembly, integration and test of subsystems for qualification testing as well as prototype systems for system qualification, ground test and flight testing. The effort includes the planning, execution and analysis to complete the defined HACM test strategy. ***FY 2022 Plans:*** Effort begins the planning, execution and analysis to assist in the completion of a defined HACM test strategy. ***FY 2023 Base Plans:*** Effort continues the assembly, integration and test of subsystems for qualification testing as well as prototype systems for system qualification, ground test and flight testing. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 funding increased compared to FY 2022 by $38.367 million due to the ramp up of efforts to develop the HACM missile.	0.000	0.000	38.367	-	38.367
Title: Program Support ***Description:*** Provides associated direct cite authority civilian pay and contractor support for HACM requirements. ***FY 2022 Plans:*** Efforts include Digital Engineering (DE), WOSA development/support, DE Infrastructure, mission planning and direct cite authority civilian pay. ***FY 2023 Base Plans:***	0.000	0.000	21.943	-	21.943

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604033F / *Hypersonics Prototyping*	**Project (Number/Name)** 643883 / *Hypersonic Attack Cruise Missile*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Efforts include Digital Engineering (DE), WOSA development/support, DE Infrastructure, mission planning, container design, tech orders and direct cite authority civilian pay. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 funding increased compared to FY 2022 by $21.943 million due to a increase in DE infrastructure requirement.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	316.887	-	316.887

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Project integrates Air Force & Defense Advanced Research Projects Agency (DARPA) enabled systems technologies into a prototype that will demonstrate a multi-mission weapon concept to be fielded as a long range prompt strike capability. Includes scope to develop/test/demonstrate prototype weapon through Digital Model-Based System Engineering (MBSE) process, implementing WOSA and Agile Software Development. The HACM program will prioritize integration on the F-15E platform to enable quick entry into flight test.

The Air Force will award a Cost Plus Fixed Fee (CPFF) contract to procure all long lead parts, materials and labor for HACM Critical Design Review Development.

Acquisition Strategy approved Dec 2021 which designated HACM as a Section 804 Middle Tier of Acquisition (MTA) Pathway (Rapid Prototyping). Engaging OSD MTA Panel for pathway concurrence 2nd Quarter FY 2022.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604033F / *Hypersonics Prototyping*	Project (Number/Name) 643883 / *Hypersonic Attack Cruise Missile*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
HACM prime contractor support, analysis, technical risk reduction, and development.	C/CPFF	Multiple: TBD: Various : TBD	-	-		-		256.577	Nov 2022	-		256.577	Continuing	Continuing	-
		Subtotal	-	-		-		256.577		-		256.577	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development & Prototyping	C/CPFF	Multiple: TBD: Various : TBD	-	-		-		8.539	Dec 2022	-		8.539	Continuing	Continuing	-
Direct Cite Authority Civilian Pay	Allot	Not specified : TBD : TBD	-	-		-		3.912	Feb 2023	-		3.912	Continuing	Continuing	-
		Subtotal	-	-		-		12.451		-		12.451	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	C/TBD	Multiple: TBD: Various : TBD	-	-		-		38.367	Nov 2022	-		38.367	Continuing	Continuing	-
		Subtotal	-	-		-		38.367		-		38.367	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Services	C/TBD	Multiple: TBD: Various : TBD	-	-		-		9.492	Oct 2022	-		9.492	Continuing	Continuing	-
		Subtotal	-	-		-		9.492		-		9.492	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604033F / *Hypersonics Prototyping*	Project (Number/Name) 643883 / *Hypersonic Attack Cruise Missile*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks															
Includes A&AS support requirements plus TDY and office supplies.															

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		-		316.887		-		316.887	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604033F / *Hypersonics Prototyping*	**Project (Number/Name)** 643883 / *Hypersonic Attack Cruise Missile*

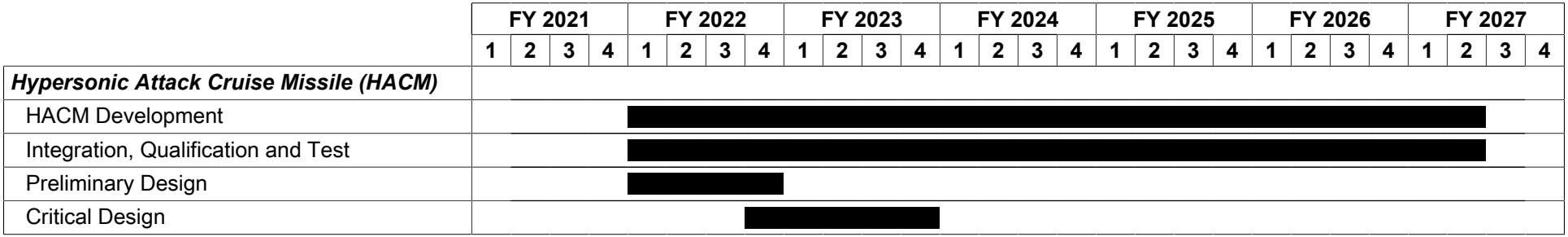

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604033F / *Hypersonics Prototyping*	**Project (Number/Name)** 643883 / *Hypersonic Attack Cruise Missile*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Hypersonic Attack Cruise Missile (HACM)				
HACM Development	1	2022	2	2027
Integration, Qualification and Test	1	2022	2	2027
Preliminary Design	1	2022	4	2022
Critical Design	4	2022	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0604183F / *Hypersonics Prototyping - Hypersonic Attack Cruise Missile (HACM)*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	0.000	190.116	144.891	0.000	144.891	117.282	33.226	0.000	90.540	0.000	576.055
644183: *Hypersonic Attack Cruise Missile (HACM)*	-	0.000	190.116	144.891	0.000	144.891	117.282	33.226	0.000	90.540	0.000	576.055
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Hypersonic Attack Cruise Missile (HACM) integrates advanced technologies and mature designs into an All-Up Round (AUR) prototype and will demonstrate a fieldable long range prompt strike capability. HACM will design, develop, manufacture, and test a number of prototype vehicles to inform future HACM acquisition decisions.

HACM will mature hypersonic technologies, processes, and resources to include: subsystem integration, infrastructure and testing advancements, digital engineering, open systems architecture, modeling and simulation, analytics, and high performance computing environments.

This PE is not a new start. HACM is currently listed under both 64033F/BPAC 643883 and PE 64183F/BPAC 644183 and will be consolidated to this PE (64183F/BPAC 644183) during the next budget update.

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 FY 2021 $0.000 million was expended for civilian pay expenses in this program element, and in FY 2022 $2.360 million is forecasted for civilian pay expenses in this program element.

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604183F / *Hypersonics Prototyping - Hypersonic Attack Cruise Missile (HACM)*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	190.116	144.891	0.000	144.891
Total Adjustments	0.000	190.116	144.891	0.000	144.891
• 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	190.116	144.891	0.000	144.891

Change Summary Explanation

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY 2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: HACM Development	-	168.040	106.891	-	106.891
Description: Three industry performers purchasing hardware and developing a preliminary design. Followed by a single performer purchasing hardware and completing a critical design, and initial long-lead flight test asset hardware, to include aircraft integration assets.					
FY 2022 Plans: This effort consists of HACM requirements development, hardware purchases, trade studies, completion of preliminary design and start of critical design maturation using a model-based Digital Engineering (DE) ecosystem. The effort also includes the incorporation of Air Force enabled technologies into the design, evaluation of system performance, applying a Weapon Open System Architecture (WOSA) standard and program planning.					
FY 2023 Base Plans: Effort will utilize a single industry performer to build upon preliminary design activities and mature HACM to critical design. The effort will continue model-based engineering activities and the DE ecosystem to complete					

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604183F / *Hypersonics Prototyping - Hypersonic Attack Cruise Missile (HACM)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
critical design analysis, design verification testing, systems integration, lab development, initial qualification testing, initial flight test hardware orders, aircraft integration assets, and WOSA compliance evaluation. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 funding decreased compared to FY 2022 by $61.149 million due to the completion of PDR in FY 2022, advancement to CDR in FY 2023, and initial hardware orders.					
Title: Integration, Qualification, and Test ***Description:*** This effort includes the government costs associated to assembly, integration and test of subsystems for qualification testing as well as prototype systems for system qualification, ground test and flight testing. The effort includes the planning, execution and analysis to complete the defined HACM test strategy. ***FY 2022 Plans:*** Effort begins the planning, execution and analysis to assist in the completion of a defined HACM test strategy. ***FY 2023 Base Plans:*** Effort continues the assembly, integration and test of subsystems for qualification testing as well as prototype systems for system qualification, ground test and flight testing. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY2023 funding increased compared to FY 2022 by $32.877 million due to the ramp up of efforts to develop the HACM missile.	-	5.123	38.000	-	38.000
Title: Program Support ***Description:*** Provides associated direct cite authority civilian pay and contractor support for HACM requirements. ***FY 2022 Plans:*** Efforts include Digital Engineering (DE), WOSA development/support, DE Infrastructure, mission planning and direct cite authority civilian pay. ***FY 2023 Base Plans:*** Efforts include Digital Engineering (DE), WOSA development/support, DE Infrastructure, mission planning, container design, tech orders and direct cite authority civilian pay. ***FY 2023 OCO Plans:***	-	16.953	0.000	0.000	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604183F / *Hypersonics Prototyping - Hypersonic Attack Cruise Missile (HACM)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Funding decreased due to DE infrastructure. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 funding decreased compared to FY 2022 by $16.953 million.					
Accomplishments/Planned Programs Subtotals	-	190.116	144.891	0.000	144.891

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

Project integrates Air Force & Defense Advanced Research Projects Agency (DARPA) enabled systems technologies into a prototype that will demonstrate a multi-mission weapon concept to be fielded as a long range prompt strike capability. Includes scope to develop/test/demonstrate prototype weapon through Digital Model-Based System Engineering (MBSE) process, implementing WOSA and Agile Software Development. The HACM program will prioritize integration on the F-15E platform to enable quick entry into flight test.

The Air Force will award a Cost Plus Fixed Fee (CPFF) contract to procure all long lead parts, materials and labor for HACM Critical Design Review Development.

Acquisition Strategy approved Dec 2021 which designated HACM as a Section 804 Middle Tier of Acquisition (MTA) Pathway (Rapid Prototyping). Engaging OSD MTA Panel for pathway concurrence 2nd quarter of FY 2022.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604183F / *Hypersonics Prototyping - Hypersonic Attack Cruise Missile (HACM)*	**Project (Number/Name)** 644183 / *Hypersonic Attack Cruise Missile (HACM)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
HACM prime contractor support, analysis, technical risk reduction, and development	C/CPFF	Multiple: TBD: Various : TBD	-	-		168.040	Jun 2022	144.891	Mar 2023	-		144.891	Continuing	Continuing	-
		Subtotal	-	-		168.040		144.891		-		144.891	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development & Prototyping	C/CPFF	Multiple: TBD: Various : TBD	-	-		5.675	Apr 2022	-		-		-	Continuing	Continuing	-
Direct Cite Authority Civilian Pay	Allot	Not specified: TBD : TBD	-	-		2.360	May 2022	-		-		-	Continuing	Continuing	-
		Subtotal	-	-		8.035		-		-		-	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation	C/TBD	Multiple: TBD: Various : TBD	-	-		5.123	Jun 2022	-		-		-	Continuing	Continuing	-
		Subtotal	-	-		5.123		-		-		-	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Services	C/TBD	Multiple: TBD: Various : TBD	-	-		8.918	Apr 2022	-		-		-	Continuing	Continuing	-
		Subtotal	-	-		8.918		-		-		-	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604183F / *Hypersonics Prototyping - Hypersonic Attack Cruise Missile (HACM)*	Project (Number/Name) 644183 / *Hypersonic Attack Cruise Missile (HACM)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks Includes A&AS support requirements plus TDY and office supplies.															

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		190.116		144.891		-		144.891	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604183F / *Hypersonics Prototyping - Hypersonic Attack Cruise Missile (HACM)*	**Project (Number/Name)** 644183 / *Hypersonic Attack Cruise Missile (HACM)*

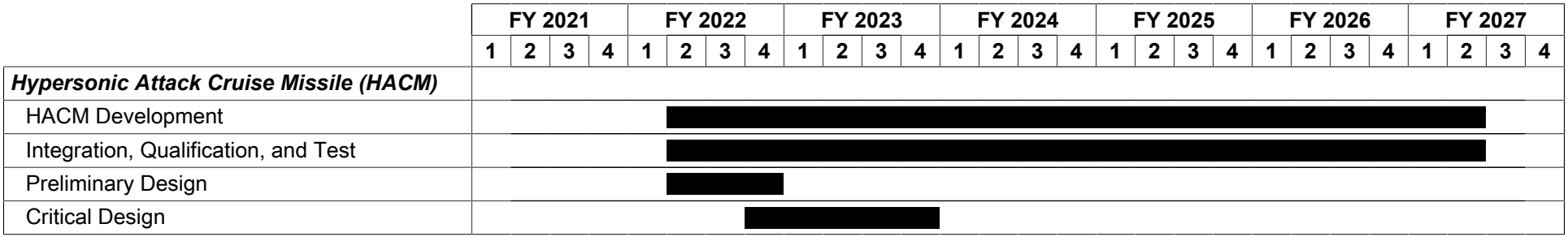

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604183F / *Hypersonics Prototyping - Hypersonic Attack Cruise Missile (HACM)*	**Project (Number/Name)** 644183 / *Hypersonic Attack Cruise Missile (HACM)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Hypersonic Attack Cruise Missile (HACM)				
HACM Development	2	2022	2	2027
Integration, Qualification, and Test	2	2022	2	2027
Preliminary Design	2	2022	4	2022
Critical Design	4	2022	4	2023

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force												Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0604201F / *PNT Resiliency, Mods, and Improvements*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	0.000	39.742	12.010	0.000	12.010	0.000	0.000	0.000	0.000	0.000	51.752
641030: *GPS Receiver Development*	-	0.000	39.742	12.010	0.000	12.010	0.000	0.000	0.000	0.000	0.000	51.752

A. Mission Description and Budget Item Justification

PE 0604201F, Project 641030 covers the research, development, qualification, and testing of Enhanced Anti-Jam (EAJ) Military Code (M-Code) Global Positioning System (GPS) receivers for Air Force and joint weapon systems. This includes updates to weapon mission planning software to support new M-Code and EAJ receiver development. These acquisitions will enable the Air Force to increase its operational Positioning, Navigation, and Timing (PNT) resiliency while satisfying the DoD and civil mandates. Fielding of EAJ M-Code weapons requires research, development, qualification and testing of M-Code receivers across the Air Force Program Executive Officer (AFPEO) Weapons portfolio. Funds may be used to address emerging and short notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues.

This requirement supports performance of a full financial audit as required by title 10 U.S.C. Chapter 9A, Sec 240-D.

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 FY21 0.0M was expended for civilian pay expenses in this program element, and in FY22 1.8M is forecasted for civilian pay expenses in this program element.

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force					Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*			R-1 Program Element (Number/Name) PE 0604201F / *PNT Resiliency, Mods, and Improvements*		
B. Program Change Summary ($ in Millions)	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**
Previous President's Budget	0.000	39.742	0.000	0.000	0.000
Current President's Budget	0.000	39.742	12.010	0.000	12.010
Total Adjustments	0.000	0.000	12.010	0.000	12.010
• 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	12.010	0.000	12.010

Change Summary Explanation

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY 2023 cannot be made in a relevant manner.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604201F / *PNT Resiliency, Mods, and Improvements*	Project (Number/Name) 641030 / *GPS Receiver Development*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
641030: *GPS Receiver Development*	-	0.000	39.742	12.010	0.000	12.010	0.000	0.000	0.000	0.000	0.000	51.752
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This munitions receiver development project includes development of a GPS M-code receiver with EAJ and analysis efforts. M-code receivers with EAJ provide advanced Positioning, Navigation, and Timing (PNT) capabilities required for weapons to operate in Adversarial Anti-access/Area Denial (A2/AD) environments. M-Code receivers with EAJ also provide increased accuracy, better signal acquisition, and advanced security.

M-code receivers with EAJ capability assures continued weapon system precision and lethality.

Fielding EAJ M-Code weapons requires research, development, qualification, testing, and mission planning of M-Code receivers across the weapons portfolio. This will include all systems, subsystems, software, fuzing, and support activities associated with the development and implementation of M-Code receivers.

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 FY21 0.0M was expended for civilian pay expenses in this program element, and in FY22 1.8M is forecasted for civilian pay expenses in this program element.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: M-Code EAJ	0.000	39.742	12.010
Description: M-Code/EAJ receivers provide an enhanced anti-jam capability. M-Code/EAJ receivers provide the capability to operate in increasing adversarial A2/AD jamming environment. M-Code/EAJ receivers also provide increased accuracy, better signal acquisition, and advanced security. ***FY 2022 Plans:*** Perform design and development of High Anti-Jam Miniature M-Code Enhanced Receiver (HAMMER), and support design of Joint Air-to-Surface Standoff Missile (JASSM) Anti-Jam GPS Receiver (JAGR) M-Code capability. ***FY 2023 Plans:*** Continue performing design and development of High Anti-Jam Miniature M-Code Enhanced Receiver (HAMMER), and support design of JASSM Anti-Jam GPS Receiver (JAGR) M-Code capability. ***FY 2022 to FY 2023 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604201F / *PNT Resiliency, Mods, and Improvements*	**Project (Number/Name)** 641030 / *GPS Receiver Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Funding decreased due to engineering and schedule changes to the receiver design and development work in FY 2023.			
Accomplishments/Planned Programs Subtotals	0.000	39.742	12.010

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• RDTE 07 0207327F: *Small Diameter Bomb (SDB)*	6.000	11.606	13.532	-	13.532	-	-	-	-	0.000	31.138
• RDTE 04 PE 0604327F, BPAC 645341: *Direct Strike Penetrators*	1.402	-	-	-	-	-	-	-	-	0.000	1.402
• RDTE 05 0604618F: *Joint Direct Attack Munition*	6.555	-	-	-	-	-	-	-	-	0.000	6.555
• RDTE 07 0207325F: *Joint Air-to-Surface Standoff Missile (JASSM)*	0.000	0.000	0.000	0.000	0.000	-	-	-	-	0.000	0.000

Remarks

D. Acquisition Strategy

M-Code/EAJ effort uses a Family of Systems (FoS) approach where the weapons prime contractors develop receivers capable of operating in any of their Air Force weapons. The receivers are based on a common, internally-developed Interface Requirements Specification (IRS), Technology Requirement Document (TRD), and threat scenarios. This approach uses a combination of contract types based on acquisition phase (Technology Maturation & Risk Reduction (TMRR), Development, Production) and risk. The weapons system program offices share a common development Program Element (PE) to allow flexibility in funding and planning, switching to individual PEs for receiver integration, operational testing, and production. The M-Code/EAJ weapons receiver development effort leverages technology currently under development by the Military GPS User Equipment (MGUE) program and will provide the warfighter with unmatched capability to operate in future A2/AD environments.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604201F / *PNT Resiliency, Mods, and Improvements*	**Project (Number/Name)** 641030 / *GPS Receiver Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Common Weapons M-Code Receiver Development (SDB II)	Various	Raytheon : Tucson, AZ	-	-		20.354	Apr 2022	6.246	Jan 2023	-		6.246	0.000	26.600	-
Common Weapons M-Code Receiver Development (CAAP ASIC)	MIPR	DMEA/Global Foundries : Hopewell Junction, NY	-	-		4.273	Apr 2022	-		-		-	0.000	4.273	-
Common Weapons M-Code Receiver Development (JASSM C+ + Phase II)	Various	Lockheed Martin : Orlando, FL	-	-		1.397	Apr 2022	-		-		-	0.000	1.397	-
Common Weapons M-Code Receiver Development (JASSM MCU)	Various	Lockheed Martin : Orlando, FL	-	-		2.313	Apr 2022	-		-		-	0.000	2.313	-
Common Weapons M-Code Receiver Development (JASSM JAGR)	Various	Lockheed Martin : Orlando, FL	-	-		9.605	Apr 2022	5.764	Jan 2023	-		5.764	Continuing	Continuing	-
		Subtotal	-	-		37.942		12.010		-		12.010	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DCA CIV PAY	Allot	Allotment : Eglin AFB, FL	-	-		1.800	Apr 2022	-		-		-	0.000	1.800	-
		Subtotal	-	-		1.800		-		-		-	0.000	1.800	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		39.742		12.010		-		12.010	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604201F / *PNT Resiliency, Mods, and Improvements*	Project (Number/Name) 641030 / *GPS Receiver Development*	

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604201F / *PNT Resiliency, Mods, and Improvements*	**Project (Number/Name)** 641030 / *GPS Receiver Development*

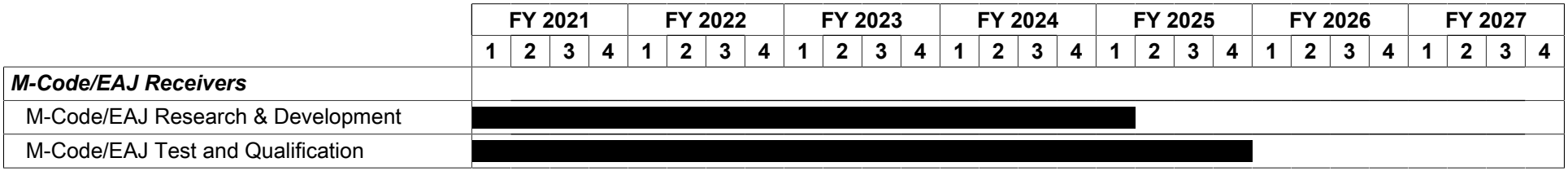

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604201F / *PNT Resiliency, Mods, and Improvements*	**Project (Number/Name)** 641030 / *GPS Receiver Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
M-Code/EAJ Receivers				
M-Code/EAJ Research & Development	1	2021	1	2025
M-Code/EAJ Test and Qualification	1	2021	4	2025

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0604257F / *Advanced Technology and Sensors*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	25.901	23.745	13.311	0.000	13.311	10.155	10.344	10.563	10.798	Continuing	Continuing
644818: *Imaging and Targeting Support*	-	17.068	14.641	13.311	0.000	13.311	10.155	10.344	10.563	10.798	Continuing	Continuing
645148: *Common Airborne Sense and Avoid (C-ABSAA)*	-	8.833	9.104	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Note

FY2023, PE 0604257F (Advanced Technology and Sensors), Project 645148, (Common Airborne Sense and Avoid) funds were transferred to align funding with Air Force project priorities and requirements. Project 645148 was strategically paused.

A. Mission Description and Budget Item Justification

The Advanced Technology and Sensors (ATS) program coordinates the development of advanced technologies (sensors, data links, targeting support, and quick reaction capabilities) in support of multiple airborne reconnaissance platforms, both manned and unmanned. Its objectives are to develop, demonstrate, and rapidly transition advanced, interoperable, multi-platform solutions to reduce the find, fix, target, and track kill chain timeline, and to provide safe separation and collision avoidance for remotely piloted aircraft. This program coordinates the development of common collection, processing, and dissemination solutions for near-real time intelligence, surveillance, and reconnaissance. The ATS program also increases interoperability by developing common standards and interfaces.

The funds in this program are distributed in priority order for the goal of building a comprehensive Geospatial Intelligence (GEOINT) capability for the USAF. On an annual basis, developmental technologies are reviewed against warfighter capabilities and requirements based on strategic roadmaps and on the results of the Airborne Sensors for ISR Analysis of Alternatives, as prefaced in the Challenging Targets Initial Capabilities Document. Efforts advancing the technological maturity of promising sensors and processing capabilities are reviewed and prioritized into a recommended list for senior executive direction to implement in the coming year. The program office has the ability to rapidly initiate an Imaging & Targeting Support (I&TS) project in order to expedite development and acquisition of urgently needed capabilities for the warfighter.

The Air Force is pursuing a software-intensive approach to maintain safe separation, avoid collisions, and provide the ability to safely integrate with other airspace users. The software solutions identified in this Information System Capability Development Document (IS-CDD) are open and modular and accept inputs from any type of sensor or data link and will operate any legacy and future Group 4 and 5 RPA. The effort includes technology maturation, risk reduction, EMD and life-cycle costs, such as: 1) prototyping activities, 2) streamlined development, test and implementation of the software, 3) development of open system architecture using modular design, standards-based interfaces, and widely-supported consensus-based standards, and 4) collaboration with the Federal Aviation Agency (FAA), National Aeronautics and Space Administration (NASA), and other services to develop national policy and standards.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604257F / *Advanced Technology and Sensors*

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.

The Advanced Technology and Sensors (ATS) funding also supports innovation activities to include studies, analyses, requirements definition, and quick-reaction capability prototypes/demonstrations to accelerate planning for technology transition, technology insertion and future acquisition programs. This program element may include necessary civilian pay expenses required to manage, execute, and deliver technology and sensor capabilities. The use of such program funds would be in addition to civilian pay expenses budgeted in program element 0304260F.

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

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	24.702	23.745	0.000	0.000	0.000
Current President's Budget	25.901	23.745	13.311	0.000	13.311
Total Adjustments	1.199	0.000	13.311	0.000	13.311
• 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	1.199	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	13.311	0.000	13.311

Change Summary Explanation

FY21 increase due to approved BTR supporting AgilePod.

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604257F / *Advanced Technology and Sensors*	Project (Number/Name) 644818 / *Imaging and Targeting Support*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
644818: *Imaging and Targeting Support*	-	17.068	14.641	13.311	0.000	13.311	10.155	10.344	10.563	10.798	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The purpose of the I&TS project is to develop, mature, demonstrate, and rapidly transition next-generation, persistent, wide area surveillance and common imagery reconnaissance sensor capabilities (active and passive systems), including sensor data processing, for multiple airborne platforms, as well as sensor products to aid in rapid targeting (e.g., geolocation models, sensor-based exploitation tools, sensor networking capabilities). Includes multi-INT integration efforts intended to cross-cue or fuse with SIGINT products in order to create a holistic ISR picture for warfighters and the IC.

Developmental efforts pursued include improved sensor performance, new and improved sensor capabilities and modes, new and/or unique modalities, and enabling technologies. Improved sensor performance includes but is not limited to: increased geolocation accuracy, increased dismount detection capability, and advanced sensor data correlation. New and improved sensor capabilities include but are not limited to: Hyperspectral Imagery (HSI), Polarimetric Imaging (PI), Ground and Dismount Moving target indicator (GMTI/ DMTI), maritime search/track, Inverse Synthetic Aperture Radar, Foliage Penetration (FOPEN), and nuclear event detection. New and improved sensor modes include but are not limited to: high resolution imagery, Ground and Dismount Moving Target Indicator (GMTI/DMTI), persistent surveillance, wide area motion imagery, and Spectral Identification. New and unique sensor modalities include but are not limited to: low frequency SAR, Hyperspectral Imagery (HSI), and Light Detection And Ranging (LIDAR). Enabling Technologies include but are not limited to: automated and assisted target detection/recognition, Artificial Intelligence (AI), Machine Learning (ML), network centric warfare, integrated multi-sensor capabilities to detect and identify obscured targets, TCPED (Tasking, Collection, Planning, Exploitation, and Dissemination) improvements related to sensors, automated registration, and imagery product quality assurance. New and improved sensor capabilities that involve massed sensing involving SUASs and low-cost sensors for Attritable aircraft.

These efforts are intended to accelerate delivery of data from sensor to user for both target search and target engagement (kill-chain) activities. This project will also increase interoperability by developing and advancing common standards (e.g. Open Mission Systems (OMS), Sensor Open System Architecture (SOSA), Common Open Architecture Radar Programs (COARPS), Multi-INT Common Open Architecture Reconnaissance Program Standard (MI-COARPS), National Imagery Transmission Format, AgilePod and data reduction) and interfaces.

Activities also include studies and analysis to support both current program planning and execution and future program planning. This program element may include necessary civilian pay expenses required to manage, execute, and deliver technology and sensor capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F.

I&TS funding also supports innovation activities to include studies, analyses, requirements definition, and quick-reaction capability prototypes/demonstrations to accelerate planning for technology transition, technology insertion and future acquisition programs. This program element may include necessary civilian pay expenses

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604257F / *Advanced Technology and Sensors*	**Project (Number/Name)** 644818 / *Imaging and Targeting Support*

required to manage, execute, and deliver technology and sensor capabilities. The use of such program funds would be in addition to civilian pay expenses budgeted in program element 0304260F.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Imaging & Targeting Support (I&TS)	17.068	14.641	13.311

Description: Corporately prioritized Air Force Multi-INT Portfolio of projects to develop and demonstrate next generation airborne sensors and processing technologies to further the art of the possible and/or transition ISR capabilities (ex: radar improvement, next-generation HSI, LIDAR, ISR Standards, EO/IR, and data mitigation technologies).

FY 2022 Plans:
Continue to develop, modernize, and demonstrate lower TRL projects into transition ready efforts. The following FY21 efforts will continue into FY22:
- Multi-INT Object-level Targeting Imagery Fusion-engine (MOTIF)
- Autonomous Multi-IMINT Adaptive Tasking Engine (AUTOMATE)
- MI-COARPS Processor for Real-Time Embedded Performance (MICPREP)

These efforts and new proposed projects will be approved through the GEOINT Capabilities Working Group (GCWG) Executive Element process. Efforts are approved in the summer prior to the start of the new fiscal year.

New FY22 GCWG approved efforts to include:
- MAGIC Heat
- Reactive Artificial Intelligence for GEOINT On-Line Data (RAINGOD)
- Agile ATR in Highly-Contested Environment (HCE) (BirdBox V2)
- Automated On-Board GEOINT ATR and SIGINT Sensor Fusion
- Surveillance and Targeting Open Real-time Multi-INT (STORM)

FY 2023 Plans:
Will continue to develop, modernize, and demonstrate lower TRL projects into transition ready efforts. The following FY22 efforts will continue into FY23:
- MAGIC Heat
- Reactive Artificial Intelligence for GEOINT On-Line Data (RAINGOD)
- Agile ATR in Highly-Contested Environment (HCE) (BirdBox V2)
- Automated On-Board GEOINT ATR and SIGINT Sensor Fusion
- Surveillance and Targeting Open Real-time Multi-INT (STORM)

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604257F / *Advanced Technology and Sensors*	**Project (Number/Name)** 644818 / *Imaging and Targeting Support*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
These efforts and new proposed projects will be approved through the GEOINT Capabilities Working Group (GCWG) Executive Element process. Efforts are approved in the summer prior to the start of the new fiscal year. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease in funding due to realignment of funds to higher Air Force priorities			
Accomplishments/Planned Programs Subtotals	17.068	14.641	13.311

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Imaging and Targeting Support efforts are prioritized on an annual basis by the GCWG, in accordance with the validated gaps in the Challenging Targets Initial Capabilities Document. Resulting funded efforts are then contracted for and/or executed by either various program offices, laboratories, industry, and/or other government agencies.

Acquisition strategy is to maximize commercial and national development efforts and investment through multiple contracting methods, including the use of Engineering Change Proposals to modify existing contracts and new contracts that were awarded both competitively or on a sole source basis.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604257F / *Advanced Technology and Sensors*	**Project (Number/Name)** 644818 / *Imaging and Targeting Support*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SHERLOC	SS/CPFF	Collins : Westford, MA	-	0.018	May 2021	-		-		-		-	Continuing	Continuing	-
H-Chip	SS/CPFF	EO Vista : Acton, MA	-	1.895	Dec 2020	-		-		-		-	Continuing	Continuing	-
Predator/Reaper Off-board Sensing and Improved Targeting (PROSIT)	SS/CPFF	Various : Various, OH	-	0.047	Jul 2021	-		-		-		-	Continuing	Continuing	-
AgilePod	SS/CPFF	Various : Various	-	5.469	May 2021	-		-		-		-	Continuing	Continuing	-
COARPS Compliant Detection Removal and Characterization (DRACO)	SS/CPFF	Lockheed Martin : Goodyear, AZ	-	0.351	Mar 2021	-		-		-		-	Continuing	Continuing	-
Automated Electro-Optical Mobile Target Classification Deep Learning	SS/CPFF	Ball Aerospace : Dayton, OH	-	2.640	Apr 2021	0.811	Mar 2022	-		-		-	Continuing	Continuing	-
Aether Spy	SS/CPFF	Various : Various	-	0.422	Sep 2021	-		-		-		-	Continuing	Continuing	-
MOTIF	SS/CPFF	SRI : Ann Arbor, MN	-	1.300	Apr 2021	0.902	Sep 2022	-		-		-	Continuing	Continuing	-
Real Time Turbulence Mitigation	SS/CPFF	Centauri : Chantilly, VA	-	0.230	Apr 2021	0.000	Dec 2021	-		-		-	Continuing	Continuing	-
AUTOMATE	SS/CPFF	SRI : Ann Arbor, MN	-	1.150	Apr 2021	0.279	Sep 2022	-		-		-	Continuing	Continuing	-
MICPREP	SS/CPFF	General Dynamics : Bloomington, MN	-	0.000	Sep 2021	0.725	Jun 2022	2.029	Nov 2022	-		2.029	Continuing	Continuing	-
LIDAR for Mid to High Alt	SS/CPFF	Ball Aerospace : Dayton, OH	-	0.600	Aug 2021	-		-		-		-	Continuing	Continuing	-
Multi ATR	SS/CPFF	BAE Systems : Durham, NC	-	0.400	Sep 2021	-		-		-		-	Continuing	Continuing	-
MAGIC Heat	SS/CPFF	BAE Systems : Durham, NC	-	-		0.897	Mar 2022	2.000	Jan 2023	-		2.000	Continuing	Continuing	-
RAINGOD	SS/CPFF	Northrop Grumman : Dayton, OH	-	-		2.250	Apr 2022	0.750	Jan 2023	-		0.750	Continuing	Continuing	-
BirdBox V2 ATR in HCE	SS/CPFF	Various : Dayton, OH	-	-		1.596	Feb 2022	1.910	Nov 2022	-		1.910	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604257F / *Advanced Technology and Sensors*	**Project (Number/Name)** 644818 / *Imaging and Targeting Support*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Auto On-board GEOINT ATR and SIGINT Sensor Fusion	SS/CPFF	Lockheed Martin : Arlington, VA	-	-		2.000	Apr 2022	0.770	Nov 2022	-		0.770	Continuing	Continuing	-
STORM	SS/CPFF	Raytheon : McKinney, TX	-	-		1.427	Jun 2022	3.426	Nov 2022	-		3.426	Continuing	Continuing	-
New FY22 Technology Efforts (Prioritized by GCWG)	C/CPAF	Various : TBD	-	-		1.808	Apr 2022	-		-		-	Continuing	Continuing	-
New FY23 Technology Efforts (Prioritized by GCWG)	Various	Various : TBD	-	-		-		0.301	Dec 2022	-		0.301	Continuing	Continuing	-
		Subtotal	-	14.522		12.695		11.186		-		11.186	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMA: Other Govt Cost	Various	Various : Dayton, OH	-	2.546	Mar 2021	1.946	Nov 2021	2.125	Dec 2022	-		2.125	Continuing	Continuing	-
		Subtotal	-	2.546		1.946		2.125		-		2.125	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	17.068		14.641		13.311		-		13.311	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604257F / *Advanced Technology and Sensors*	**Project (Number/Name)** 644818 / *Imaging and Targeting Support*

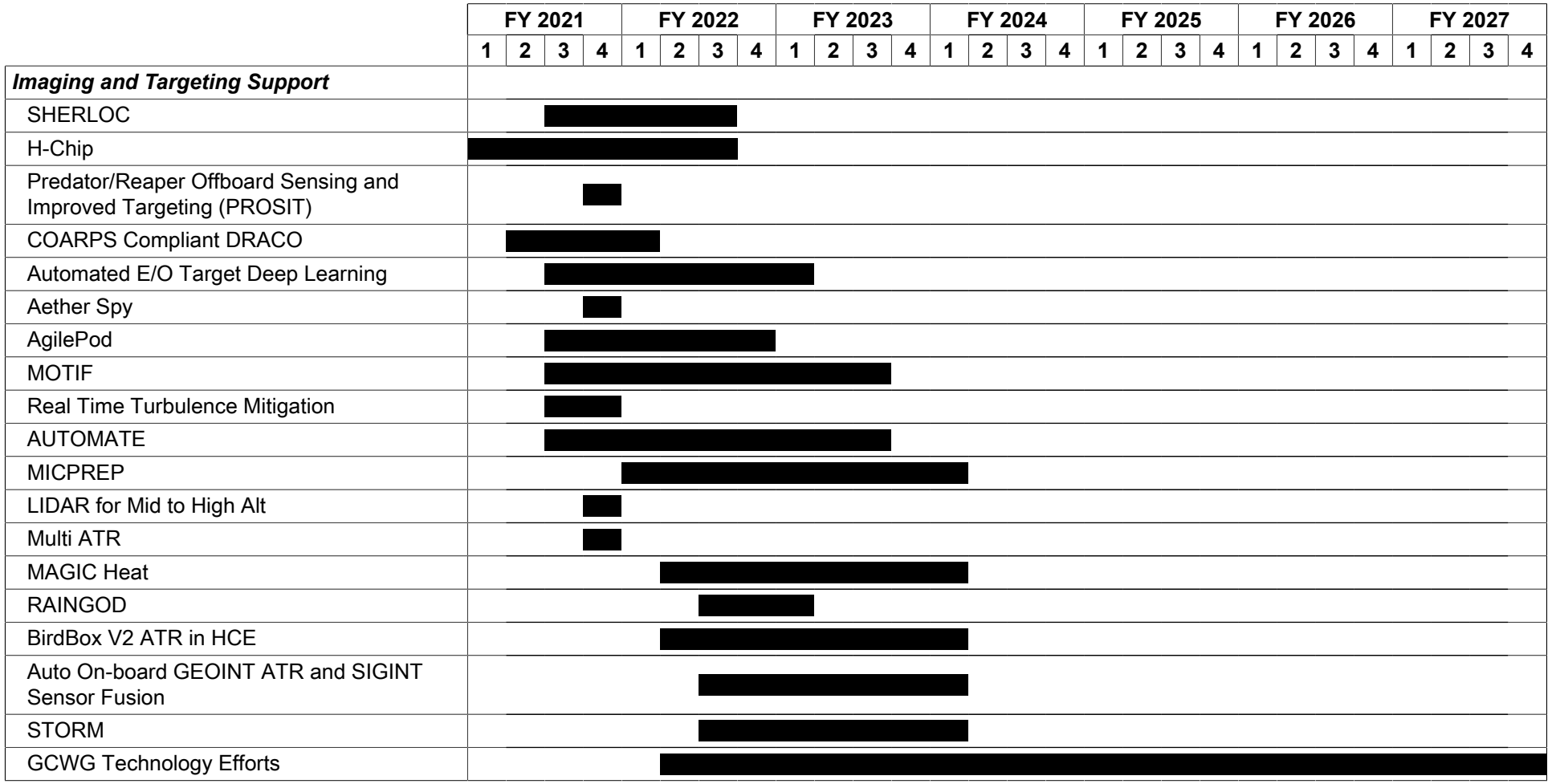

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604257F / *Advanced Technology and Sensors*	**Project (Number/Name)** 644818 / *Imaging and Targeting Support*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Imaging and Targeting Support				
SHERLOC	3	2021	3	2022
H-Chip	1	2021	3	2022
Predator/Reaper Offboard Sensing and Improved Targeting (PROSIT)	4	2021	4	2021
COARPS Compliant DRACO	2	2021	1	2022
Automated E/O Target Deep Learning	3	2021	1	2023
Aether Spy	4	2021	4	2021
AgilePod	3	2021	4	2022
MOTIF	3	2021	3	2023
Real Time Turbulence Mitigation	3	2021	4	2021
AUTOMATE	3	2021	3	2023
MICPREP	1	2022	1	2024
LIDAR for Mid to High Alt	4	2021	4	2021
Multi ATR	4	2021	4	2021
MAGIC Heat	2	2022	1	2024
RAINGOD	3	2022	1	2023
BirdBox V2 ATR in HCE	2	2022	1	2024
Auto On-board GEOINT ATR and SIGINT Sensor Fusion	3	2022	1	2024
STORM	3	2022	1	2024
GCWG Technology Efforts	2	2022	4	2027

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604257F / *Advanced Technology and Sensors*	Project (Number/Name) 645148 / *Common Airborne Sense and Avoid (C-ABSAA)*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
645148: *Common Airborne Sense and Avoid (C-ABSAA)*	-	8.833	9.104	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 Common-Airborne Sense and Avoid (C-ABSAA) project provides Group 4 and 5 Remotely Piloted Aircraft (RPA) with the ability to safely and effectively operate in all classes of airspace worldwide. The C-ABSAA project acts as a replacement for the sense and avoid capability of the pilot on board a manned aircraft.

The Air Force is pursuing a software intensive approach to maintain safe separation, avoid collisions, and provide the ability to safely integrate with other airspace users. The software solutions identified in this Information System Capability Development Document (IS-CDD) are open and modular and accept inputs from any type of sensor or data link and will operate any legacy and future Group 4 and 5 RPA. The effort includes technology maturation, risk reduction, and software processes and initiatives, such as: 1) prototyping activities, 2) system integration, test and implementation of software, 3) development of open system architecture using modular design, standards-based interfaces, and widely-supported consensus-based standards, 4) development of model based system engineering processes, standards and documentation and, 5) collaboration with the Federal Aviation Agency (FAA), National Aeronautics and Space Administration (NASA), and other services to develop national policy and standards.

The program element may include necessary civilian pay expenses required to manage, execute, and deliver technology and sensor capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Sense and Avoid (SAA)-Related Activities	8.833	9.104	0.000
Description: Conduct risk reduction and prototyping activities to improve affordability, reduce cost, schedule and technical risk entering next milestone. Received Joint Staff approval of Information Systems CDD requirements. C-ABSAA uses an iterative and incremental approach to design, code, integrate, test and implement high quality software in a cost effective and timely manner. The software utilizes Open System Architecture (OSA) design, COTS, Application Programming Interfaces (APIs), and maximum software and interface module independence. Program will also develop and certify Government simulation tools and equipment. ***FY 2022 Plans:*** FY 2022 Plans: - Complete and close remaining C-ABSAA Technology Maturation & Risk Reduction actions to posture for future efforts			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604257F / *Advanced Technology and Sensors*	**Project (Number/Name)** 645148 / *Common Airborne Sense and Avoid (C-ABSAA)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
- Complete review and acceptance of Technical Data Package - Allocate remaining funds to expedite existing projects or start new projects within the Advanced Technology & Sensors program under the Imaging and Targeting Support project ***FY 2023 Plans:*** - Program strategically paused. Funding transferred to United States Air Force higher priority needs. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding transferred to United States Air Force higher priority needs.			
Accomplishments/Planned Programs Subtotals	8.833	9.104	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Program strategically paused. Pre-milestone B information archived for future use when needed.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604257F / *Advanced Technology and Sensors*	Project (Number/Name) 645148 / *Common Airborne Sense and Avoid (C-ABSAA)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
C-ABSAA Technology Development	C/Various	Various : Various	-	4.113	Nov 2020	4.104	Dec 2021	-		-		-	0.000	8.217	-
		Subtotal	-	4.113		4.104		-		-		-	0.000	8.217	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Administration (PMA)	Various	Various : Various	-	4.720	Oct 2020	5.000	Dec 2021	-		-		-	0.000	9.720	-
		Subtotal	-	4.720		5.000		-		-		-	0.000	9.720	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	8.833		9.104		-		-		-	0.000	17.937	N/A

Remarks

Program strategically paused. FY23 funding transferred to United States Air Force higher priority needs.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604257F / *Advanced Technology and Sensors*	**Project (Number/Name)** 645148 / *Common Airborne Sense and Avoid (C-ABSAA)*

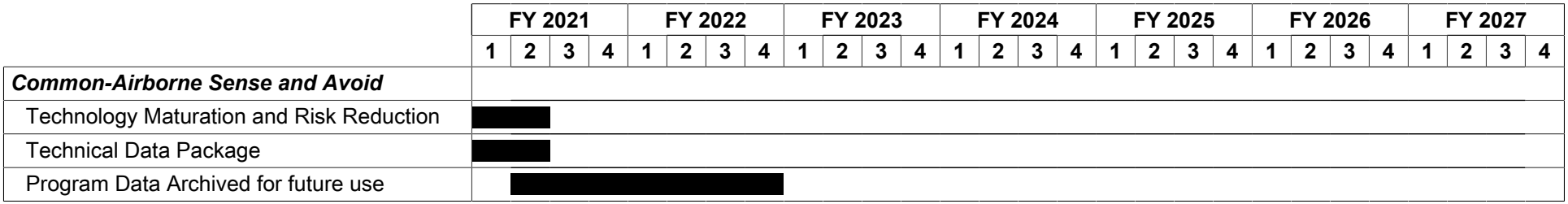

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604257F / *Advanced Technology and Sensors*	**Project (Number/Name)** 645148 / *Common Airborne Sense and Avoid (C-ABSAA)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Common-Airborne Sense and Avoid				
Technology Maturation and Risk Reduction	1	2021	2	2021
Technical Data Package	1	2021	2	2021
Program Data Archived for future use	2	2021	4	2022

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0604288F / *Survivable Airborne Operations Center*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	50.038	95.788	203.213	0.000	203.213	609.966	856.916	837.722	738.364	Continuing	Continuing
646507: *Survivable Airborne Operations Center (SAOC)*	-	50.038	95.788	203.213	0.000	203.213	609.966	856.916	837.722	738.364	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Survivable Airborne Operations Center (SAOC), formerly known as the E-4B National Airborne Operations Center (NAOC) Recapitalization effort, will replace the aging E-4B fleet which faces capability gaps, diminishing manufacturing sources, increased maintenance costs, and parts obsolescence as it approaches the end of its serviceable life. The recapitalization effort is informed by Air Force and Department of Defense analyses used to determine a holistic approach to replacing the aging E-4B fleet and capabilities of other nuclear and national command and control mission sets.

SAOC will provide POTUS, SECDEF and the CJCS a worldwide, survivable, and enduring node of the National Military Command System (NMCS) to fulfill national security requirements throughout all stages of conflict. As a command, control and communications center directing US forces, executing emergency war orders and coordinating the activities of civil authorities including national contingency plans, this capability ensures continuity of operations plans and continuity of government as required in a national emergency or after negation/destruction of ground command and control centers. SAOC will fulfill the requirements of the AF Nuclear Mission by providing Nuclear Command, Control and Communications (NC3) capabilities to execute Nuclear Command and Control (NC2) Concept of Operations (CONOPS) that enable the exercise of authority and direction by the President to command and control US military nuclear weapon operations.

Program funding includes funds for emerging requirements to support program office operations, management services (Federally Funded Research and Development Centers [FFRDC], Advisory and Assistance Services [A&AS], etc.), Program Management Support (PMS), security, facilities, prototyping, equipment, integrate Digital Engineering and other efforts as required to establish the required program office capabilities. Funding will also support all activities required to award and execute development contract(s) for the SAOC Weapon System to include supporting test activities and prototype, development, sustainment, and integration activities of NC3 or other DoD programs supporting SAOC development.

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 0605831F. In FY21 $0.391M was expended for civilian pay expenses in this program element, and in FY22 $4.2M is forecasted for civilian pay expenses in this program element.

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604288F / *Survivable Airborne Operations Center*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	59.390	133.253	0.000	0.000	0.000
Current President's Budget	50.038	95.788	203.213	0.000	203.213
Total Adjustments	-9.352	-37.465	203.213	0.000	203.213
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-37.465			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-7.569	0.000			
• SBIR/STTR Transfer	-1.783	0.000			
• Other Adjustments	0.000	0.000	203.213	0.000	203.213

Change Summary Explanation

FY 2021 reflects reprogramming adjustments in the amount of $7.569M that went to other Air Force higher priority bills.

FY 2022 reflects an enacted Air Force requested $37.465M transfer to PE 0303131F.

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY 2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: SAOC	50.038	95.788	203.213
Description: The SAOC weapon system will be comprised of a Commercial Derivative Aircraft (CDA), mission system, and ground support systems. The CDA will be hardened to protect against nuclear and electromagnetic effects and modified with an aerial refueling capability to enable sustained airborne operations. The mission system will integrate secure communications and planning capabilities on modern information technology (IT) infrastructure based on a Modular Open System Architecture (MOSA). The ground systems include aircrew trainers, mission crew trainers, maintenance training devices, ground support equipment, test and sustainment system integration laboratories, and other ground systems to enable the operations, sustainment, and future modifications of the SAOC weapon system across the lifecycle.			
FY 2022 Plans: -Complete SAOC Acquisition Strategy approval -Complete development of the System Requirements Document (SRD)			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604288F / *Survivable Airborne Operations Center*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
-Complete industry-supported market research to support Request for Proposal (RFP) release and documentation development for milestone decisions -Complete and release the SAOC RFP and begin source selection -Expand planning, prototyping, and acquisition activities with industry that are required for integration of, or in support of, NC3 systems, directed systems, communications systems, Advanced Battle Management System (ABMS), mission system laboratories, or other assets/hardware -Support development, modernization, or sustainment of required NC3, Command, Control and Communications (C3), Cryptographic, Open Architecture/Open Mission System, and other capabilities to ensure systems are sustainable and available to integrate into the SAOC Weapon System -Conduct mitigation activities for diminishing manufacturing issues impacting mission systems to avoid upgrade/redesign expense -Continue to implement the infrastructure, training, and preparation activities and investments to develop the Digital Engineering Environment to execute and support the development and lifecycle sustainment of the SAOC Weapon System -Continue the program office manning growth-path required to support the SAOC system development ***FY 2023 Plans:*** -Conclude Source Selection activities, complete Milestone requirements, and award the SAOC contract(s) to begin executing Engineering and Manufacturing Development (EMD) contract activities -Continue supporting development and modernization of required NC3, Command, Control and Communications (C3), Cryptographic, Open Architecture/Open Mission System, and other capabilities to ensure systems are sustainable and available to integrate into the SAOC Weapon System -Support test planning and preparation activities -Continue to implement the infrastructure, training, and preparation activities and investments to develop the Digital Engineering Environment to execute and support the development and lifecycle sustainment of the SAOC Weapon System -Continue program office manning growth-path required to support the SAOC system development ***FY 2022 to FY 2023 Increase/Decrease Statement:*** -Funding increased because of continued program pre-development preparatory activities to mitigate risk and prepare for program execution, and award of the EMD contract			
Accomplishments/Planned Programs Subtotals	50.038	95.788	203.213

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604288F / *Survivable Airborne Operations Center*

E. Acquisition Strategy

Based on National Airborne Operations Center (NAOC), Executive Airlift, Airborne National Command Post (ABNCP), Take Charge and Move Out (TACAMO) [NEAT] Analysis of Alternatives (AoA) findings and revalidated Capabilities Development Document (CDD) required capabilities, the SAOC program is pursuing an accelerated market research phase to finalize the acquisition strategy and rapidly pursue system development. The SAOC acquisition strategy involves the award of development and production contracts on a competitive basis to an offeror(s) who will procure required aircraft, bring each aircraft to a common configuration, make required modifications, develop and integrate the mission system into each aircraft and provide required ground systems.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604288F / *Survivable Airborne Operations Center*	Project (Number/Name) 646507 / *Survivable Airborne Operations Center (SAOC)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
EMD	C/TBD	TBD : TBD	-	-		-		134.866	Sep 2023	-		134.866	Continuing	Continuing	-
Pre-Development Contract Activities/Studies	C/Various	TBD : TBD	-	14.434	Apr 2021	60.348	Jan 2022	28.655	Oct 2022	-		28.655	Continuing	Continuing	-
		Subtotal	-	14.434		60.348		163.521		-		163.521	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Direct Mission Support	C/Various	Various : Bedford, MA : TBD	-	15.647	Oct 2020	15.402	Oct 2021	6.021	Oct 2022	-		6.021	Continuing	Continuing	-
Direct Cite Civilian Pay	TBD	Not specified. : Hanscom AFB, MA	-	0.374	Jul 2021	4.000	Oct 2021	4.282	Oct 2022	-		4.282	Continuing	Continuing	-
		Subtotal	-	16.021		19.402		10.303		-		10.303	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FFRDC	SS/CPFF	Various : Bedford, MA : Hanscom AFB, MA	-	10.004	Oct 2020	6.064	Oct 2021	14.104	Oct 2022	-		14.104	Continuing	Continuing	-
EPASS (A&AS)	C/CPFF	Various : Bedford, MA : Hanscom AFB, MA	-	7.821	Jul 2021	7.240	Jul 2022	12.255	Jul 2023	-		12.255	Continuing	Continuing	-
PMA - Other	Various	Various : Bedford, MA : Hanscom AFB, MA	-	1.758	Oct 2020	2.734	Oct 2021	3.030	Oct 2022	-		3.030	Continuing	Continuing	-
		Subtotal	-	19.583		16.038		29.389		-		29.389	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604288F / *Survivable Airborne Operations Center*	Project (Number/Name) 646507 / *Survivable Airborne Operations Center (SAOC)*	

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	50.038		95.788		203.213		-		203.213	Continuing	Continuing	N/A

Remarks

Product Development:
-FY22 increase in Pre-Development Contract Activities/Studies from FY21 accelerates pre-development activities by investing in necessary product development to prepare program for execution in 4QTR FY23
-Decrease in FY23 Pre-Development Contract Activities/Studies is due to concluding pre-EMD preparatory activities
-Increase in FY23 due to EMD contract award 4QTR FY23

Support:
-FY22 Direct Mission Support continues implementation of digital engineering tool infrastructure and efforts
-Decrease in FY23 Direct Mission Support is due to completing deployment of digital engineering tool infrastructure

Management Services:
-Increase in FY23 attributed to continuing program office ramp up to support EMD contract award 4QTR FY23

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604288F / *Survivable Airborne Operations Center*	**Project (Number/Name)** 646507 / *Survivable Airborne Operations Center (SAOC)*

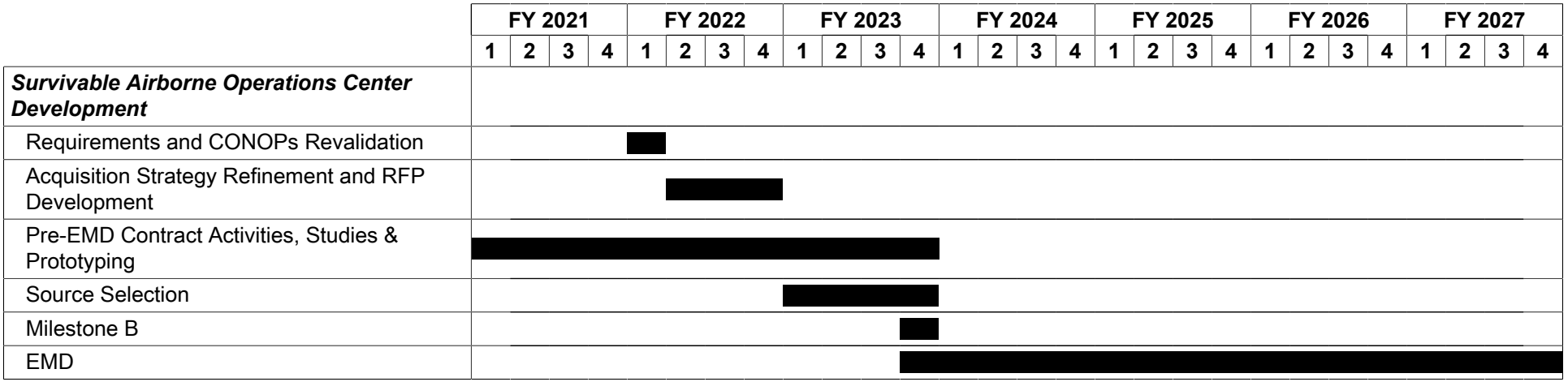

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604288F / *Survivable Airborne Operations Center*	**Project (Number/Name)** 646507 / *Survivable Airborne Operations Center (SAOC)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Survivable Airborne Operations Center Development				
Requirements and CONOPs Revalidation	1	2022	1	2022
Acquisition Strategy Refinement and RFP Development	2	2022	4	2022
Pre-EMD Contract Activities, Studies & Prototyping	1	2021	4	2023
Source Selection	1	2023	4	2023
Milestone B	4	2023	4	2023
EMD	4	2023	4	2027

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0604317F / *Technology Transfer*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	16.823	56.768	16.759	0.000	16.759	13.671	13.942	14.235	14.428	Continuing	Continuing
64317A: *64317A Technology Transfer Add*	-	0.000	0.000	2.672	0.000	2.672	5.339	5.453	5.568	5.568	Continuing	Continuing
646003: *Partnership Intermediary Agreement(s)*	-	16.823	28.000	3.329	0.000	3.329	3.396	3.459	3.532	3.611	Continuing	Continuing
646030: *AFwerX*	-	0.000	28.768	10.758	0.000	10.758	4.936	5.030	5.135	5.249	0.000	59.876

A. Mission Description and Budget Item Justification

Technology Transfer is a critical strategy for the NDS and DoD that makes the best possible use of national scientific, technical resources and information to enhance the effectiveness of DoD forces and warfighting capability systems. The Air Force Technology Transfer program oversees all Air Force inventions/patents and technology transfer agreements.

In FY 2012, DoD devolved management of OSD sponsored Partnership Intermediaries (PIAs) to the Air Force (AF). The Air Force Technology Transfer & Transition Office manages the Montana State University's TechLink & MilTech PIAs as well as AF PIAs. TechLink brokered 70% of DoD licenses over the past 10 years. The 646003 project includes the management of DoD/AF PIAs, Federal Lab Consortium Fees, invention disclosure & patent fees, information management data base, travel, training, outreach and tech scouting events. This program impacts virtually all technology fields, including medical, software, electronics, communications, advanced materials, energy-related technologies, and more. This effort support our mission to innovate and modernize DoD weapon systems through collaborative teamwork and strategic partnerships.

The AFWERX mission is to transition agile, affordable, and accelerated capabilities by teaming innovative technology developers with Airmen and Guardian talent. AFWERX leverages Spark (the Airmen and Guardian talent base), AFVentures (the dual-use expanded technology base), and Prime (technology transitions) to scale and accelerate the capability. Funding in this project supports AFWERX research and development, non-Small Business Innovation Research/ Small Business Technology Transfer (SBIR/STTR) civilian personnel pay, innovation hubs, and non-SBIR/STTR information technology, public affairs, and marketing. The Spark mission is to inspire and enable Airmen and Guardians to unleash their potential and to drive capability development that increases the efficiency, effectiveness and quality of life of the warfighter. AFWERX uses Spark to discover and translate innovative talent into executable projects by facilitating stakeholder alignment through workshops and challenges. This inspires and ignites creativity as well as creates a bridge to the small business ecosystem reached through the SBIR/STTR program. This connection brings together the creativity, innovation, and entrepreneurial spirit of small businesses and our Airmen and Guardians to solve Air and Space Force technology and capability gaps.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Technology Transfer capabilities. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program element 0605827F, 0605828F, 0605829F, 0605832F, 0605833F, 0605898F, 0606398F.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604317F / *Technology Transfer*

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

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	16.980	15.768	0.000	0.000	0.000
Current President's Budget	16.823	56.768	16.759	0.000	16.759
Total Adjustments	-0.157	41.000	16.759	0.000	16.759
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	41.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.157	0.000			
• Other Adjustments	0.000	0.000	16.759	0.000	16.759

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Project: 646003: *Partnership Intermediary Agreement(s)*		
Congressional Add: *Program Increase - technology partnerships*	4.000	-
Congressional Add: *Program increase - academic partnership intermediary agreement tech transfer*	10.000	0.000
Congressional Add: *Program Increase- Technology Transfer*	-	7.000
Congressional Add: *Program Increase- Digital part transformation to support operational readiness*	-	20.000
Congressional Add Subtotals for Project: 646003	14.000	27.000
Project: 646030: *AFwerX*		
Congressional Add: *Program Increase-Academic partnership intermediary agreements*	-	10.000
Congressional Add: *Program Increase-Partnership intermediary agreements*	-	4.000
Congressional Add Subtotals for Project: 646030	-	14.000
Congressional Add Totals for all Projects	14.000	41.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604317F / *Technology Transfer*

Change Summary Explanation

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604317F / *Technology Transfer*	Project (Number/Name) 64317A / *64317A Technology Transfer Add*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
64317A: *64317A Technology Transfer Add*	-	0.000	0.000	2.672	0.000	2.672	5.339	5.453	5.568	5.568	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The AFWERX mission is to transition agile, affordable, and accelerated capabilities by teaming innovative technology developers with Airmen and Guardian talent. AFWERX leverages Spark (the Airmen and Guardian talent base), AFVentures (the dual-use expanded technology base), and Prime (technology transitions) to scale and accelerate the capability. Funding in this project supports AFWERX research and development, non-Small Business Innovation Research/ Small Business Technology Transfer (SBIR/STTR) civilian personnel pay, innovation hubs, and non-SBIR/STTR information technology, public affairs, and marketing. The Spark mission is to inspire and enable Airmen and Guardians to unleash their potential and to drive capability development that increases the efficiency, effectiveness and quality of life of the warfighter. AFWERX uses Spark to discover and translate innovative talent into executable projects by facilitating stakeholder alignment through workshops and challenges. This inspires and ignites creativity as well as creates a bridge to the small business ecosystem reached through the SBIR/STTR program. This connection brings together the creativity, innovation, and entrepreneurial spirit of small businesses and our Airmen and Guardians to solve Air and Space Force technology and capability gaps.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Technology Transfer capabilities under project 646030/ AFWERX.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Civilian Pay	-	0.000	2.672
Description: Provide professional government civilian workforce in support of AFWERX programs and activities. ***FY 2022 Plans:*** Not applicable ***FY 2023 Plans:*** FY 2023 Funding increased compared to FY 2022 by $2.672 million to fund civilian pay for AFwerX program listed above. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY2023 funding increase to fund civilian pay for AFwerX program listed above.			
Accomplishments/Planned Programs Subtotals	-	0.000	2.672

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604317F / *Technology Transfer*	**Project (Number/Name)** 64317A / *64317A Technology Transfer Add*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

Not applicable

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604317F / *Technology Transfer*	Project (Number/Name) 64317A / *64317A Technology Transfer Add*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Not specified.	C/CPAF	Not specified. : TBD	-	-		-		2.672		-		2.672	Continuing	Continuing	-
		Subtotal	-	-		-		2.672		-		2.672	Continuing	Continuing	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		-		2.672		-		2.672	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604317F / *Technology Transfer*	**Project (Number/Name)** 64317A / *64317A Technology Transfer Add*

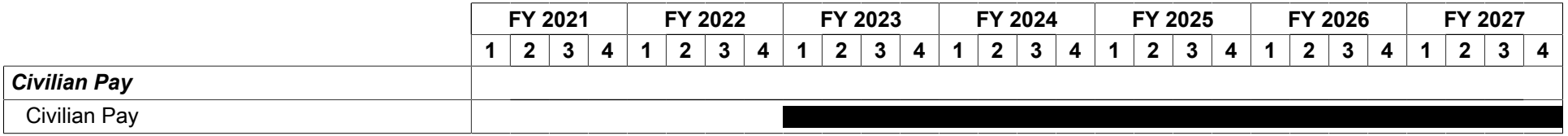

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604317F / *Technology Transfer*	**Project (Number/Name)** 64317A / *64317A Technology Transfer Add*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Civilian Pay				
Civilian Pay	1	2023	4	2027

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604317F / *Technology Transfer*	Project (Number/Name) 646003 / *Partnership Intermediary Agreement(s)*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
646003: *Partnership Intermediary Agreement(s)*	-	16.823	28.000	3.329	0.000	3.329	3.396	3.459	3.532	3.611	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In FY 2012, DoD devolved management of OSD sponsored Partnership Intermediaries (PIs) to the Air Force (AF). The Air Force Technology Transfer & Transition Office manages the Montana State University's TechLink & MilTech Partnership Intermediary Agreements (PIAs) as well as Air Force Partnership Intermediary Agreements (PIAs). TechLink brokered 70% of DoD licenses over the past 10 years. Technology Transfer is a critical strategy for the National Defense Strategy and DoD that makes the best possible use of national scientific, technical resources and information to enhance the effectiveness of DoD forces and warfighting capability systems. The Air Force Technology Transfer program oversees all AF inventions/patents and technology transfer agreements. This project includes the management of DoD/AF PIAs, Federal Lab Consortium Fees, invention disclosure & patent fees, information management data base, travel, training, outreach and tech scouting events. This program impacts virtually all technology fields, including medical, software, electronics, communications, advanced materials, energy-related technologies, and more. This effort support our mission to innovate and modernize DoD weapon systems through collaborative teamwork and strategic partnerships.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Technology Transfer	2.823	1.000	3.329
Description: Enhance and expand transfer of technologies between DoD and the commercial sector.			
FY 2022 Plans: Continue to implement new cost-effective approaches to further increase and accelerate transfer of technologies developed at DoD laboratories and facilitate their transition to the warfighter. Evaluate and market DoD laboratory inventions and broker technology transfer agreements/Cooperative Research and Development Agreements (CRADAs), to include commercial licenses, that will support the US defense mission and benefit the US economy. Engage the innovative capabilities of non-traditional defense contractors in developing and commercializing new dual-use products and services.			
FY 2023 Plans: Continue to implement new cost-effective approaches to further increase and accelerate transfer of technologies developed at DoD laboratories and facilitate their transition to the warfighter. Evaluate and market DoD laboratory inventions and broker technology transfer agreements/Cooperative Research and Development Agreements (CRADAs), to include commercial licenses, that will support the US defense mission and benefit the US economy. Engage the innovative capabilities of non-traditional defense contractors in developing and commercializing new dual-use products and services.			
FY 2022 to FY 2023 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604317F / *Technology Transfer*	**Project (Number/Name)** 646003 / *Partnership Intermediary Agreement(s)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY 2023 Funding increased compared to FY 2022 by 2.329 million due to restoral of FY 2022 funds through the FY 2022 President's Budget Request which went into BPAC 646030 versus 646003.			
Accomplishments/Planned Programs Subtotals	2.823	1.000	3.329

	FY 2021	FY 2022
Congressional Add: Program Increase - technology partnerships ***FY 2021 Accomplishments:*** Conduct Congressionally directed effort	4.000	-
Congressional Add: Program increase - academic partnership intermediary agreement tech transfer ***FY 2021 Accomplishments:*** Conduct Congressionally directed effort ***FY 2022 Plans:*** Conduct Congressionally directed effort	10.000	0.000
Congressional Add: Program Increase- Technology Transfer ***FY 2022 Plans:*** Conduct Congressionally directed effot	-	7.000
Congressional Add: Program Increase- Digital part transformation to support operational readiness ***FY 2022 Plans:*** Conduct Congressionally directed effort	-	20.000
Congressional Adds Subtotals	14.000	27.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

N/A

D. Acquisition Strategy

This effort uses a Partnership Intermediary Agreement (PIA) with TechLink at Montana State University. Through this agreement TechLink helps the Department of Defense to establish licensing and other technology transfer agreements with US industry. The effort is run through the Air Force Research Laboratory/Small Business office at Wright Patterson Air Force Base.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604317F / *Technology Transfer*	Project (Number/Name) 646003 / *Partnership Intermediary Agreement(s)*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
License DoD inventions for conversion into new products and services	PO	TechLink : Bozeman, MT	-	2.823	Jan 2021	1.000		3.329		-		3.329	Continuing	Continuing	-
Congressional Add - technology partnerships	PO	TechLink : Bozeman, MT	-	4.000	Apr 2021	-		-		-		-	0.000	4.000	-
Congressional Add - academic partnership intermediary agreement tech transfer	PO	Air Force APEX : Dayton, OH	-	10.000	Apr 2021	-		-		-		-	0.000	10.000	-
Congressional Add-technology transfer	PO	TechLink : Bozeman, MT	-	-		7.000		-		-		-	Continuing	Continuing	-
Congressional Add-digital part transformation to support operational readiness	PO	NIAR : Wichita, KS	-	-		20.000		-		-		-	Continuing	Continuing	-
		Subtotal	-	16.823		28.000		3.329		-		3.329	Continuing	Continuing	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	16.823		28.000		3.329		-		3.329	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604317F / *Technology Transfer*	**Project (Number/Name)** 646003 / *Partnership Intermediary Agreement(s)*

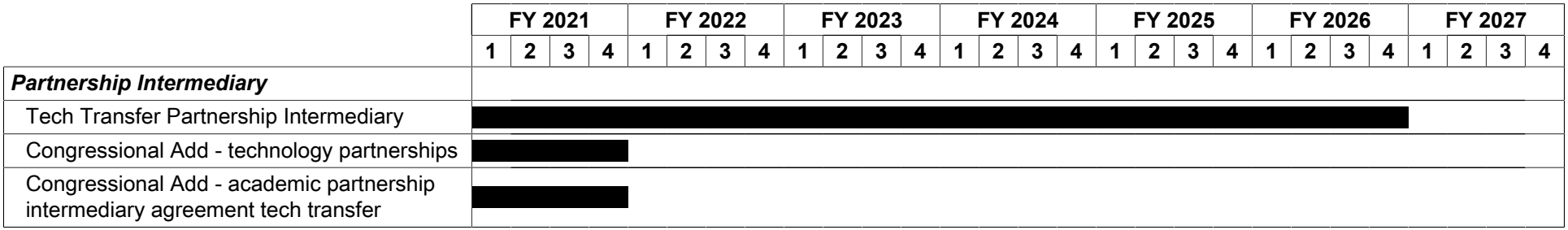

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604317F / *Technology Transfer*	**Project (Number/Name)** 646003 / *Partnership Intermediary Agreement(s)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Partnership Intermediary				
Tech Transfer Partnership Intermediary	1	2021	4	2026
Congressional Add - technology partnerships	1	2021	4	2021
Congressional Add - academic partnership intermediary agreement tech transfer	1	2021	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604317F / *Technology Transfer*	Project (Number/Name) 646030 / *AFwerX*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
646030: *AFwerX*	-	0.000	28.768	10.758	0.000	10.758	4.936	5.030	5.135	5.249	0.000	59.876
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The AFWERX mission is to transition agile, affordable, and accelerated capabilities by teaming innovative technology developers with Airmen and Guardian talent. AFWERX leverages Spark (the Airmen and Guardian talent base), AFVentures (the dual-use expanded technology base), and Prime (technology transitions) to scale and accelerate the capability. Funding in this project supports AFWERX research and development, non-Small Business Innovation Research/ Small Business Technology Transfer (SBIR/STTR) civilian personnel pay, innovation hubs, and non-SBIR/STTR information technology, public affairs, and marketing. The Spark mission is to inspire and enable Airmen and Guardians to unleash their potential and to drive capability development that increases the efficiency, effectiveness and quality of life of the warfighter. AFWERX uses Spark to discover and translate innovative talent into executable projects by facilitating stakeholder alignment through workshops and challenges. This inspires and ignites creativity as well as creates a bridge to the small business ecosystem reached through the SBIR/STTR program. This connection brings together the creativity, innovation, and entrepreneurial spirit of small businesses and our Airmen and Guardians to solve Air and Space Force technology and capability gaps.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Technology Transfer capabilities under project 646030/ AFWERX.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: AFWERX	0.000	14.768	10.758
Description: Transition affordable, and accelerated capabilities by teaming innovative technology developers with Airmen and Guardian talent.			
FY 2022 Plans: Continue to drive capability development and technology transition through AFWERX core activities supporting all divisions: Innovation Hubs enable seamless connections with and among industry, academia and government personnel; Products and Training provide Airmen/Guardian innovators with the mindset, experience, and tools they need to effectively transition solutions to the field at scale; Innovation Facilitation enhances innovation outcomes by guiding Airmen/Guardians through critical elements of effective innovation (proper problem scoping, program design, stakeholder alignment, industry outreach, etc.) and transition funding supports development of high-impact technology solutions. Also to develop/sustain the Acquisition Workforce.			
FY 2023 Plans: Continue to develop and sustain the Acquisition Workforce and organizational capabilities. Continue to develop increasingly integrated technology transition pathways between the AFWERX core activities. Planned activities include increasing interagency and international partner collaboration, expanded technology transition opportunities, and increased integration across			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604317F / *Technology Transfer*	**Project (Number/Name)** 646030 / *AFwerX*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Department of the Air Force innovation capabilities. Manage two major Prime technology transition programs and increase small targeted technology transitions through Airmen/Guardian-provided innovations. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 Funding decreased compared to FY 2022 by $4.01M mostly due to execution year transfer of 3.2M in FY 2022 to the Partnership Intermediary Agreement BPAC 646003 and investment under-execution buyback of $0.57 million			
Accomplishments/Planned Programs Subtotals	0.000	14.768	10.758

	FY 2021	FY 2022
Congressional Add: Program Increase-Academic partnership intermediary agreements ***FY 2022 Plans:*** Conduct Congressionally directed effort	-	10.000
Congressional Add: Program Increase-Partnership intermediary agreements ***FY 2022 Plans:*** Conduct Congressionally directed effort	-	4.000
Congressional Adds Subtotals	-	14.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Both FY22 Congressionally directed efforts will be executed in the 646003 Partnership Intermediary Agreements BPAC.

D. Acquisition Strategy

The Innovation Hubs, Products and Training, and Innovation Facilitation are awarded through a combination of Partnership Intermediary Agreements and competitive contract vehicles, some of which are directly awarded by AFWERX and others are executed through federal partnerships as appropriate.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604317F / *Technology Transfer*	Project (Number/Name) 646030 / *AFwerX*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Innovation Hub (Collaboration Space, Operations)	PO	DefenseWerx : Ft Walton Beach, FL	-	-		3.100		3.568		-		3.568	0.000	6.668	-
Facilitation (Challenges, Workshops & Events)	PO	VA Tech Applied Res Corp : Arlington, VA	-	-		2.200		2.600		-		2.600	0.000	4.800	-
Prototype & Transition	MIPR	Capital-Factory : Austin, TX	-	-		0.700		1.100		-		1.100	0.000	1.800	-
Product Development and Tools & Training	Various	All AFWERX locations : TBD	-	-		3.200		3.490		-		3.490	0.000	6.690	-
		Subtotal	-	-		9.200		10.758		-		10.758	0.000	19.958	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Congressional Add-academic partnership intermediary agreements	PO	Air Force APEX : Dayton, OH	-	-		10.000		-		-		-	Continuing	Continuing	-
Congressional Add-partnership intermediary agreements	PO	TechLink : Bozeman, MT	-	-		4.000		-		-		-	Continuing	Continuing	-
		Subtotal	-	-		14.000		-		-		-	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Acquisition workforce	Allot	HQ Air Force : Arlington, VA	-	-		5.568		-		-		-	0.000	5.568	-
		Subtotal	-	-		5.568		-		-		-	0.000	5.568	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604317F / *Technology Transfer*	Project (Number/Name) 646030 / *AFwerX*	

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		28.768		10.758		-		10.758	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604317F / *Technology Transfer*	**Project (Number/Name)** 646030 / *AFwerX*

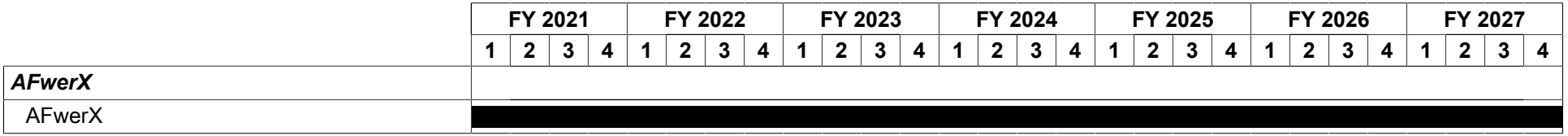

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604317F / *Technology Transfer*	**Project (Number/Name)** 646030 / *AFwerX*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
AFwerX				
AFwerX	1	2021	4	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604327F / *Hard and Deeply Buried Target Defeat System (HDBTDS) Program*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	0.000	53.026	12.886	106.826	0.000	106.826	19.222	0.000	0.000	0.000	0.000	191.960
645341: *Direct Strike Penetrator Systems*	0.000	53.026	12.886	106.826	0.000	106.826	19.222	0.000	0.000	0.000	0.000	191.960
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Direct Strike Penetrator Systems program develops and modifies a family of advanced precision-guided penetrator munitions to include evaluation of integrated technologies for the development/integration of advanced position, navigation, and timing (PNT) capabilities (i.e., Global Positioning System (GPS), non-GPS, optical, passive, active, etc.) and smart fuze systems, and all penetrator components, that will provide the Air Force with improved ability to attack Hard and Deeply Buried Targets (HDBT), such as bunker and tunnel facilities, using air-to-surface conventional munitions. Systems developed include, but are not limited to Massive Ordnance Penetrator (MOP), GBU-72 Advanced 5,000-lb Penetrator Weapon System (A5K), and Section 804 Rapid Prototype/Rapid Fielding activities. Systems developed will be integrated onto current and future platforms to reduce the number of weapons required to hold HDBTs at risk and will result in more targets engaged per mission flown. Direct Strike Penetrators will provide critical global strike capability not met by inventory conventional weapons and will hold at risk the best protected high value assets essential to an enemy's war fighting ability. The project also provides an opportunity to quickly insert emerging technologies into existing and developing aircraft munitions and fuzes.

A Hard Target Munitions (HTM) Analysis-of-Alternatives (AoA) was conducted in 2014 to determine the best weapons and/or development efforts for addressing the HDBT mission area. The HTM AoA determined that it was necessary to develop a family of HTMs in order to apply effects to the entire range of HDBT sets. The Air Force is using the AoA to develop, produce and modify HDBT weapons identified as the most effective and affordable. Modeling and simulation is used to assess and characterize current inventory and to drive design and explore the utility of new classes of penetrator munitions.

This requirement supports performance of a full financial audit as required by title 10 U.S.C. Chapter 9A, Sec 240-D.

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 0605831F. In FY21 $1.434M was expended for civilian pay expenses in this program element, and in FY22 $0.192M is forecasted for civilian pay expenses in this program element.

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604327F / *Hard and Deeply Buried Target Defeat System (HDBTDS) Program*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	52.825	15.886	0.000	0.000	0.000
Current President's Budget	53.026	12.886	106.826	0.000	106.826
Total Adjustments	0.201	-3.000	106.826	0.000	106.826
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-3.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	2.000	0.000			
• SBIR/STTR Transfer	-1.799	0.000			
• Other Adjustments	0.000	0.000	106.826	0.000	106.826

Change Summary Explanation

FY22 Congressional mark of -$3M for unexecuted prior year balances

The FY2022 President's Budget submittal did not reflect FY2023 through FY2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Massive Ordnance Penetrator (MOP) Modification	23.292	4.647	105.758
Description: Modify the Massive Ordnance Penetrator (MOP) weapon for enhanced capability to hold additional Hard and Deeply Buried Targets at risk in multiple Combatant Commands (COCOMs). The modification will be primarily software-based and the existing inventory of Guided Bomb Unit (GBU)-57E/B will be retrofitted. Construct relevant hard and deeply buried targets for testing. Execute MOP testing in support of modification efforts to included sub-scale and full-scale ground and flight tests. Analyze MOP weapon effectiveness.			
FY 2022 Plans: Continue long-lead target build and test & evaluation of MOP Modification for enhanced capability.			
FY 2023 Plans: Continue long-lead target build and test & evaluation of MOP Modification for enhanced capability as well as accuracy enhancement effort to hold hard and deeply buried targets at risk.			
FY 2022 to FY 2023 Increase/Decrease Statement:			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604327F / *Hard and Deeply Buried Target Defeat System (HDBTDS) Program*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Funds increased to execute full test program that includes constructing complex and relevant hard and deeply buried targets for testing. Increase also supports development and test of accuracy enhancements.			
Title: Advanced 5,000 lb (A5K) Penetrator ***Description:*** GBU-72 Advanced 5,000 lb (A5K) Penetrator is an improved 5,000 lb class penetrator to address capability gaps identified in the HTM AoA. Conduct A5K design, development, integration, modeling and simulation, and testing to improve performance against increasingly hardened targets. This effort utilizes existing and improved technologies to field an integrated penetrator weapon system to include: an improved penetrator warhead, a smart fuze system that can detect layers/voids, and a modified Joint Direct Attack Munition (JDAM) tail kit for all weather, precision guidance, navigation, and control. ***FY 2022 Plans:*** Integration, modeling and simulation, and testing to improve performance against increasingly hardened targets. ***FY 2023 Plans:*** Continuation to support the finalization of DT/OT testing, remediation activities, integration, and modeling/simulation to improve the performance against increasingly hardened targets for the Advanced 5,000 pound (A5K) Penetrator weapon system. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreased due to reduced RDT&E activity as A5K approaches EMD completion and transition to production in FY23.	28.332	8.239	1.068
Title: Military Code (M-Code) and Enhanced Anti-Jam (EAJ) ***Description:*** M-Code and EAJ provides the capability to operate in increasing adversarial anti-access/area denial (A2/AD) jamming environments. M-Code and EAJ also provide increased accuracy, better signal acquisition, and advanced security. ***FY 2022 Plans:*** N/A ***FY 2023 Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A	1.402	0.000	0.000
Accomplishments/Planned Programs Subtotals	53.026	12.886	106.826

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604327F / *Hard and Deeply Buried Target Defeat System (HDBTDS) Program*

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• PAAF 01 353190: *Massive Ordnance Penetrator (MOP)*	-	15.500	19.743	0.000	19.743	13.979	8.420	-	-	Continuing	Continuing
• PAAF 01 353020: *General Purpose Bombs*	369.566	176.565	156.385	0.000	156.385	135.827	133.749	164.925	168.420	Continuing	Continuing
• RDTE 05 0604602F: *Armament/ Ordnance Development*	20.199	9.047	5.279	0.000	5.279	6.973	7.102	7.254	7.415	Continuing	Continuing
• RDTE 05 0604618F: *Joint Direct Attack Munition*	6.555	0.000	0.000	0.000	0.000	-	-	-	-	0.000	6.555
• RDTE 04 0604201F: *PNT Resiliency*	-	39.742	12.010	0.000	12.010	-	-	-	-	0.000	51.752

Remarks

E. Acquisition Strategy

MOP uses sole source cost type contracts to complete development, test, and evaluation activities.

M-Code/EAJ effort uses a Family of Systems approach where the three prime weapons contractors develop receivers capable of operating in any of their AF weapons. The receivers are based on a common, internally-developed interface requirements specification, technology requirement document, and threat scenario. This approach uses a combination of contract types based on acquisition phase (Technology Maturation and Risk Reduction, Development, Production) and risk. The Weapons System Program Offices share a common development program element to allow flexibility in funding and planning, switching to individual PEs for receiver integration, operational test, and production. The M-Code/EAJ Weapons Receiver Development effort leverages technology currently under development by the GPS-Directorate Military GPS User Equipment program and will provide the warfighter with unmatched capability to operate in future A2/AD environments.

The initial GBU-72/A5K penetrator design was accomplished through modeling, simulation, and analysis producing potential designs. The designs were developed based on the performance parameters of survivability, lethality, accuracy and penetration. The Government determined the optimum A5K design to then manufacture production representative prototypes to include warheads, fuzes and modified JDAM kits. These assets will be used to conduct and successfully complete qualification testing and integration.

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 0605831F. In FY21 $1.434M was expended for civilian pay expenses in this program element, and in FY22 $0.192M is forecasted for civilian pay expenses in this program element.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604327F / *Hard and Deeply Buried Target Defeat System (HDBTDS) Program*	**Project (Number/Name)** 645341 / *Direct Strike Penetrator Systems*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MOP Modification and Integration	SS/ Various	Boeing : St Louis, MO	0.000	7.503	Nov 2021	2.000	Jun 2022	-		-		-	Continuing	Continuing	-
		Subtotal	0.000	7.503		2.000		-		-		-	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MOP System Contractor Support	MIPR	DOTC : Albuquerque, NM	0.000	1.723	Sep 2021	0.000	Sep 2022	-		-		-	Continuing	Continuing	-
A5K System T&E Contractor Support	MIPR	DOTC/ARA/NGIS : Albuquerque, NM	0.000	2.462	Dec 2021	0.162	May 2022	-		-		-	0.000	2.624	-
A5K System T&E Government Support	MIPR	MCAAP : McAlester, OK	0.000	1.082	Nov 2021	0.331	Nov 2022	-		-		-	0.000	1.413	-
DCA Civ Pay	Allot	AFLCMC/EBD : Eglin AFB, FL	0.000	1.434	Oct 2020	0.192	Oct 2021	-		-		-	0.000	1.626	-
		Subtotal	0.000	6.701		0.685		-		-		-	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MOP Test & Evaluation	Various	AFLCMC : Eglin, Holloman, Edw, FL	0.000	0.991	Feb 2021	1.000	Sep 2022	25.634	Dec 2022	-		25.634	Continuing	Continuing	-
MOP Target Construction and Instrumentation	Various	DTRA : Albuquerque, NM	0.000	12.364	Sep 2021	1.255	Mar 2023	76.904	Jan 2023	-		76.904	Continuing	Continuing	-
A5K Developmental Test & Evaluation	Various	96 TW, 780 TS : Eglin, Holloman, FL	0.000	10.818	Jul 2022	6.000	Jul 2022	0.508	Jan 2023	-		0.508	0.000	17.326	-
A5K Operational Test & Evaluation	Various	96 TW, Det 1 : Eglin,WSMR, FL	0.000	11.964	Jun 2022	1.461	Dec 2022	0.416	May 2023	-		0.416	0.000	13.841	-
		Subtotal	0.000	36.137		9.716		103.462		-		103.462	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604327F / *Hard and Deeply Buried Target Defeat System (HDBTDS) Program*	**Project (Number/Name)** 645341 / *Direct Strike Penetrator Systems*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MOP Program Management Administration (PMA)	Various	AFLCMC/EBD : Eglin AFB, FL	0.000	0.586	Oct 2020	0.200	Mar 2022	3.220	Oct 2022	-		3.220	Continuing	Continuing	-
A5K Program Management Administration (PMA)	Various	AFLCMC/EBD : Eglin AFB, FL	0.000	2.049	Oct 2020	0.285	Mar 2022	0.144	Jan 2023	-		0.144	0.000	2.478	-
M-Code Program Management Administration (PMA)	Various	AFLCMC/EBD : Eglin AFB, FL	0.000	0.050	Oct 2020	-		-		-		-	0.000	0.050	-
		Subtotal	0.000	2.685		0.485		3.364		-		3.364	Continuing	Continuing	N/A

Remarks

Program Management Administration (PMA) funding increased to support additional MOP Modification testing activities.

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	53.026		12.886		106.826		-		106.826	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604327F / *Hard and Deeply Buried Target Defeat System (HDBTDS) Program*	**Project (Number/Name)** 645341 / *Direct Strike Penetrator Systems*

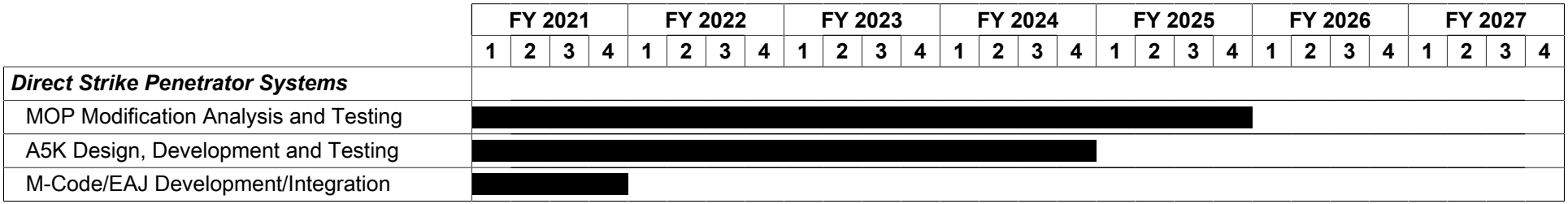

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604327F / *Hard and Deeply Buried Target Defeat System (HDBTDS) Program*	**Project (Number/Name)** 645341 / *Direct Strike Penetrator Systems*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Direct Strike Penetrator Systems				
MOP Modification Analysis and Testing	1	2021	4	2025
A5K Design, Development and Testing	1	2021	4	2024
M-Code/EAJ Development/Integration	1	2021	4	2021

Note

M-code will be fielded through the individual A5K and MOP procurement funding lines.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0604414F / *Cyber Resiliency of Weapon Systems-ACS*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	67.616	71.229	44.526	0.000	44.526	68.668	66.461	67.984	69.501	Continuing	Continuing
642812: *Acquisition/System Security Engineering*	-	0.000	26.775	21.381	0.000	21.381	26.194	25.143	35.389	36.177	Continuing	Continuing
642834: *Mitigations*	-	47.706	36.993	17.119	0.000	17.119	35.331	34.371	25.501	26.072	Continuing	Continuing
642836: *Mission Risk Analysis*	-	19.910	7.461	6.026	0.000	6.026	7.143	6.947	7.094	7.252	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program funds activities at the Cyber Resiliency Office for Weapon Systems (CROWS), which provides cyber capabilities and acquisition support to weapon system programs across the Department of the Air Force (DAF). CROWS increases the cyber resiliency of DAF weapon systems to maintain mission effective capability under adverse conditions. Its goals are to bake cyber resiliency into new weapon systems and mitigate critical vulnerabilities in fielded weapon systems. CROWS aligns the DAF with strategic guidance, such as the National Defense Strategy (NDS). The NDS highlights the re-emergence of great power competition as the central challenge to U.S. prosperity and security. This strategic guidance identified the space and cyberspace domains that require the Department of Defense to prioritize investments in cyber defense, resilience, and the continued integration of cyber capabilities into the full spectrum of military operations.

This program addresses cyber resiliency and security gaps in three primary activities to meet these goals. The first activity is to develop systems security engineering tools, techniques and procedures, and associated training and education to build cyber expertise within the acquisition workforce. This includes supporting a common secure environment to enable effective sharing of cyber intelligence and vulnerability information across multiple acquisition programs. It also includes identifying emerging technologies for further development and prototyping to posture DAF weapon systems to counter emerging threats. The second activity is to conduct threat informed weapon systems' solution analysis, identify and prioritize vulnerabilities and identify, develop and present courses of action to develop materiel and non-materiel mitigation trade space. The third activity is to design mitigation strategies and prototype mitigation solutions to critical vulnerabilities, with emphasis on those vulnerabilities that affect multiple weapon systems.

BPAC 642812 FY 2021 actuals incorrectly zeroed out; numbers do not reflect actual execution.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver CROWS weapon system capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program element 0605827F, 0605828F, 0605831F, 0605832F, 0605833F, 0605898F, 0606398F. In FY 2021 $0.032 million was expended for civilian pay expenses in this program element, and in FY 2022 $0.725 million is forecasted for civilian pay expenses in this program element.

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604414F / *Cyber Resiliency of Weapon Systems-ACS*	

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	69.656	71.229	0.000	0.000	0.000
Current President's Budget	67.616	71.229	44.526	0.000	44.526
Total Adjustments	-2.040	0.000	44.526	0.000	44.526
• 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	-2.040	0.000			
• Other Adjustments	0.000	0.000	44.526	0.000	44.526

Change Summary Explanation

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604414F / *Cyber Resiliency of Weapon Systems-ACS*	Project (Number/Name) 642812 / *Acquisition/System Security Engineering*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
642812: *Acquisition/System Security Engineering*	-	0.000	26.775	21.381	0.000	21.381	26.194	25.143	35.389	36.177	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Acquisition/System Security Engineering (SSE) activity develops Department of the Air Force (DAF) and Department of Defense system security engineering and acquisition security processes, policies, and contracting language, and refines intelligence collection and processes to provide actionable information on cyber threats to the weapons system community. This activity bolsters DAF cyber resiliency/security by supporting common secure environments for Program Offices to share information on classified weapon system cyber intelligence, threats, and vulnerabilities. It also encompasses developing cyber resiliency training, manning strategies, and Cyber Focus Teams, which provide cyber acquisition expertise to Program Executive Offices (PEO) to address acquisition workforce gaps in cyber resiliency/security manpower, experience, and knowledge. This project hones workforce expertise and skills required to counter weapon system-unique cyber threats, which exceeds the knowledge needed to secure Internet Protocol (IP) based systems against traditional network-based cyber threats. Such expertise is critical for acquisition professionals to ensure cyber resiliency/security design tenets are integrated into the weapon system's life cycle. The project also enables rapid response to emerging peer threats by focusing on early technology readiness level (TRL) efforts via non-traditional industry partners to develop and field cyber resiliency technologies to operational users. Finally, this project includes identification, evaluation, and prioritization of emerging cyber techniques, products, and technologies for further development and prototyping to posture DAF weapon systems to counter emerging threats. This activity supports DAF Program Offices, the Protecting Critical Technologies Task Force, Defense Industrial Base data protection efforts, DAF Supply Chain Risk Management, and other weapon system cyber security/resiliency activities as required.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver CROWS weapon system capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program element 0605827F, 0605828F, 0605831F, 0605832F, 0605833F, 0605898F, 0606398F. In FY 2021 $0.032 million was expended for civilian pay expenses in this program element, and in FY 2022 $0.725 million is forecasted for civilian pay expenses in this program element.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Prototype, Evaluate, and Transition System Security Engineering	0.000	26.775	21.381
Description: Prototypes, evaluates, and transitions cyber security and resiliency activities into policy, processes, products, and people.			
FY 2022 Plans: Continue to evolve the Acquisition/SSE requirements, processes, policies, and contracting language to influence cyber resiliency in all phases of the acquisition process. Refine intelligence collection and processes to provide actionable information on cyber			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604414F / *Cyber Resiliency of Weapon Systems-ACS*	**Project (Number/Name)** 642812 / *Acquisition/System Security Engineering*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
threats to the weapons system community. Continue supporting common security environments to enable program offices to collaborate/share information on classified weapon system cyber intelligence threats and vulnerabilities as well as the necessary verification and validation infrastructure (technology, hardware/software modelling and lab resources) to understand, reconcile, and program against emerging cyber resiliency attack vectors. Increase delivery of cyber expertise to PEOs through Cyber Focus Team (CFT) manpower, continue to identify acquisition cyber resiliency training gaps and analyze required knowledge and skill sets and develop increasingly more technical and hands on training to support the acquisition workforce. Continue identification, evaluation, and prioritization of emerging cyber techniques, products, and technologies for further development and prototyping to posture Air Force weapon systems to counter emerging threats. ***FY 2023 Plans:*** Continue to evolve the Acquisition/SSE requirements, processes, policies, and contracting language to influence cyber resiliency in all phases of the acquisition process. Refine intelligence collection and processes to provide actionable information on cyber threats to the weapons system community. Continue supporting common security environments to enable program offices to collaborate/share information on classified weapon system cyber intelligence threats and vulnerabilities as well as the necessary verification and validation infrastructure (technology, hardware/software modelling and lab resources) to understand, reconcile, and program against emerging cyber resiliency attack vectors. Increase delivery of cyber expertise to PEOs through Cyber Focus Team (CFT) manpower, continue to identify acquisition cyber resiliency training gaps and analyze required knowledge and skill sets and develop increasingly more technical and hands on training to support the acquisition workforce. Continue identification, evaluation, and prioritization of emerging cyber techniques, products, and technologies for further development and prototyping to posture Air Force weapon systems to counter emerging threats. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** This program has a decrease of $5.394 million from FY 2022 to FY 2023. As a result, the program will conclude common security environments modifications/builds while still enabling program offices to self sustain support to common areas to collaborate/ share information on classified weapon system cyber intelligence threats and vulnerabilities as well as the necessary verification and validation infrastructure (technology, hardware/software modelling and lab resources) to understand, reconcile, and program against emerging cyber resiliency attack vectors.			
Accomplishments/Planned Programs Subtotals	0.000	26.775	21.381

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604414F / *Cyber Resiliency of Weapon Systems-ACS*	**Project (Number/Name)** 642812 / *Acquisition/System Security Engineering*

D. Acquisition Strategy

When possible, activities in this effort will leverage current competitively-awarded contracts. Additional necessary contracts funded in this program element will be awarded using either competitive or sole source procedures, whichever is most appropriate. The government agency responsible for managing the program is the Air Force Life Cycle Management Center, Cyber Resiliency Office for Weapons Systems, Wright-Patterson Air Force Base, Ohio and Hanscom Air Force Base, Massachusetts.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604414F / *Cyber Resiliency of Weapon Systems-ACS*	**Project (Number/Name)** 642812 / *Acquisition/System Security Engineering*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Common Secure Environment	Various	Various : Various	-	-		6.250	Nov 2021	2.025	Nov 2022	-		2.025	Continuing	Continuing	-
Intel collection skills to identify cyber threats to weapon systems	Various	Various : Various	-	-		2.000	Dec 2021	2.000	Dec 2022	-		2.000	Continuing	Continuing	-
Education and Training	Various	Various : Various	-	-		1.050	Jan 2022	1.050	Jan 2023	-		1.050	Continuing	Continuing	-
Cyber Resiliency Technologies Development	Various	Various : Various	-	-		9.669	Nov 2021	8.906	Nov 2022	-		8.906	Continuing	Continuing	-
		Subtotal	-	-		18.969		13.981		-		13.981	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Security Engineering requirements, policy and guidance documents (DTIC)	Various	Various : Various	-	-		0.456	Jan 2022	0.456	Jan 2023	-		0.456	Continuing	Continuing	-
MITRE	Various	Various : Bedford, MA	-	-		4.800	Nov 2021	4.944	Nov 2022	-		4.944	Continuing	Continuing	-
CMU/SEI	Various	Carnegie Mellon Univ. : Pittsburgh, PA	-	-		0.800	Dec 2021	0.800	Dec 2022	-		0.800	Continuing	Continuing	-
		Subtotal	-	-		6.056		6.200		-		6.200	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
A&AS, Travel, Government Purchase Card	Various	Various : Various	-	-		1.750	Dec 2021	1.200	Dec 2022	-		1.200	Continuing	Continuing	-
		Subtotal	-	-		1.750		1.200		-		1.200	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604414F / *Cyber Resiliency of Weapon Systems-ACS*	Project (Number/Name) 642812 / *Acquisition/System Security Engineering*	

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		26.775		21.381		-		21.381	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604414F / *Cyber Resiliency of Weapon Systems-ACS*	**Project (Number/Name)** 642812 / *Acquisition/System Security Engineering*

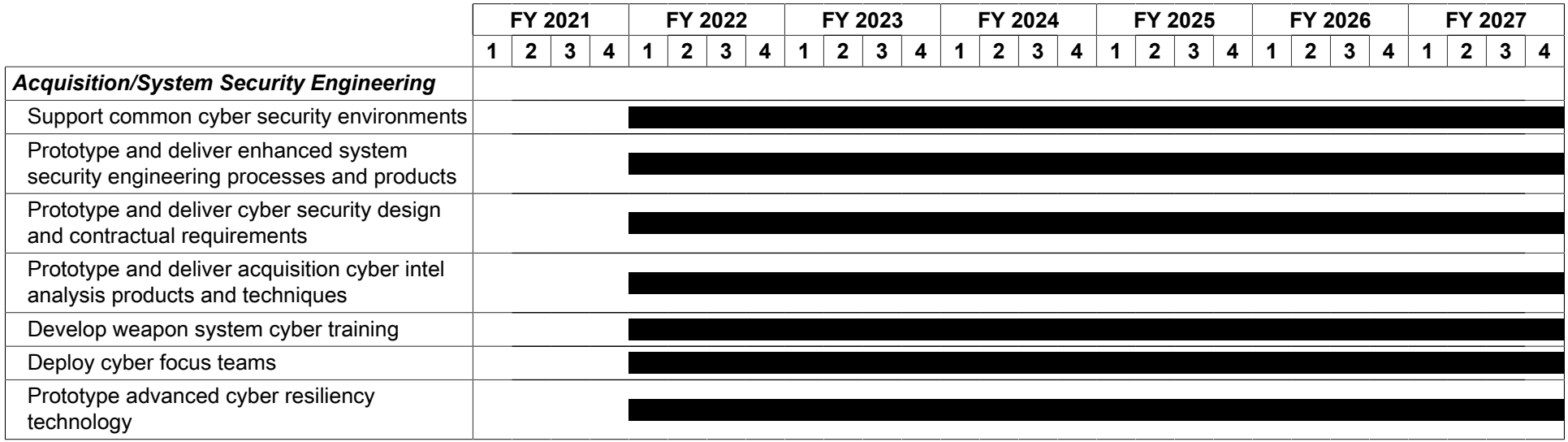

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604414F / *Cyber Resiliency of Weapon Systems-ACS*	**Project (Number/Name)** 642812 / *Acquisition/System Security Engineering*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Acquisition/System Security Engineering				
Support common cyber security environments	1	2022	4	2027
Prototype and deliver enhanced system security engineering processes and products	1	2022	4	2027
Prototype and deliver cyber security design and contractual requirements	1	2022	4	2027
Prototype and deliver acquisition cyber intel analysis products and techniques	1	2022	4	2027
Develop weapon system cyber training	1	2022	4	2027
Deploy cyber focus teams	1	2022	4	2027
Prototype advanced cyber resiliency technology	1	2022	4	2027

Note

Beginning in FY 2022, the open architecture/open standards mission will transfer to program element 0605056F to better align scope and resources associated with these activities.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604414F / *Cyber Resiliency of Weapon Systems-ACS*	Project (Number/Name) 642834 / *Mitigations*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
642834: *Mitigations*	-	47.706	36.993	17.119	0.000	17.119	35.331	34.371	25.501	26.072	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Mitigations activity prototypes mitigations to high risk cyber vulnerabilities and recommends a transition path for fielded weapon systems, subsystems, and support systems. CROWS program will perform the engineering analysis and partner with program offices for the affected weapon systems to develop a mitigation strategy. CROWS will lead the non-recurring engineering effort to prototype a mitigation that can be fielded on multiple weapon systems and transition the mitigation to programs for implementation and sustainment. CROWS will develop a mitigation handbook that catalogs proven materiel mitigations for use across Department of the Air Force weapon systems program offices to maximize return on investment in the prototyping activity.

This activity bolsters DAF cyber resiliency/security by supporting common secure environments for Program Offices to share information on classified weapon system cyber intelligence, threats, and vulnerabilities. This project also enables rapid response to emerging peer threats by focusing on early technology readiness level (TRL) efforts via non-traditional industry partners to develop and field cyber resiliency technologies to operational users.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver CROWS weapon system capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program element 0605827F, 0605828F, 0605831F, 0605832F, 0605833F, 0605898F, 0606398F. In FY 2021 $0.032 million was expended for civilian pay expenses in this program element, and in FY 2022 $0.725 million is forecasted for civilian pay expenses in this program element.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Cyber Mitigation Prototyping	47.706	36.993	17.119
Description: Evaluate weapon systems cyber risk assessments to identify, validate, and prioritize mitigations required for cyber vulnerabilities/susceptibilities. Partner with system owners and acquisition Program Offices to develop prototype mitigations.			
FY 2022 Plans: Continue focus on prototyping mitigations for cyber vulnerabilities on fielded weapon systems, subsystems, and support systems in realistic, high fidelity environments and identifying threat-informed risks/vulnerabilities. Collaborate with system owners and acquisition program offices to prototype mitigation projects and implement technology transfer of prototyped solutions within the associated acquisition program office. Develop centralized data repository for mitigations addressing weapon system cyber risks and vulnerabilities. Support mitigation integration requirements by translating/mapping threats to enterprise mitigation techniques			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604414F / *Cyber Resiliency of Weapon Systems-ACS*	**Project (Number/Name)** 642834 / *Mitigations*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
using mature methodologies for weapon system common reference architectures. Build and implement a strategy to manage OSD's & NSA's requests on DAF weapon systems' cyber vulnerability and mitigation activities. ***FY 2023 Plans:*** Continue focus on prototyping mitigations for cyber vulnerabilities on fielded weapon systems, subsystems, and support systems in realistic, high fidelity environments and identifying threat-informed risks/vulnerabilities. Collaborate with system owners and acquisition program offices to prototype mitigation projects and implement technology transfer of prototyped solutions within the associated acquisition program office. Develop centralized data repository for mitigations addressing weapon system cyber risks and vulnerabilities. Support mitigation integration requirements by translating/mapping threats to enterprise mitigation techniques using mature methodologies for weapon system common reference architectures. Build and implement a strategy to manage OSD's & NSA's requests on DAF weapon systems' cyber vulnerability and mitigation activities. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** This program has a decrease of $19.874 million from FY 2022 to FY 2023. As a result, the transition of material and non-material mitigations investments in HW/SW assurance for datalink equipment and this equipment's supporting subsystems to the fielded fleet will be impacted. This technology focus area is a critical finding from the 1647 weapon system assessments. The number of projects that will be delayed and/or canceled will depend on the current threat analysis.			
Accomplishments/Planned Programs Subtotals	47.706	36.993	17.119

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

When possible, activities in this effort will leverage current competitively-awarded contracts. Additional necessary contracts funded in this program element will be awarded using either competitive or sole source procedures. The government agency responsible for managing the program is the Air Force Life Cycle Management Center, Cyber Resiliency Office for Weapons Systems, Wright-Patterson Air Force Base, Ohio and Hanscom Air Force Base, Massachusetts.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604414F / *Cyber Resiliency of Weapon Systems-ACS*	**Project (Number/Name)** 642834 / *Mitigations*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Materiel Solutions for Major Weapon Systems	Various	Various : Various	-	9.558	Dec 2020	13.653	Jan 2022	3.845	Jan 2023	-		3.845	Continuing	Continuing	-
Materiel Solutions for Subsystems	Various	Various : Various	-	6.279	Dec 2020	7.963	Dec 2021	2.530	Dec 2022	-		2.530	Continuing	Continuing	-
Non-Materiel Solutions	Various	Various : Various	-	3.768	Dec 2020	3.957	Dec 2021	1.160	Dec 2022	-		1.160	Continuing	Continuing	-
Mitigation Distribution Tool	Various	Various : Various	-	2.511	Dec 2020	2.730	Dec 2021	0.730	Dec 2022	-		0.730	Continuing	Continuing	-
Common Secure Environments	Various	Various : Various	-	6.000	Nov 2020	-		-		-		-	Continuing	Continuing	-
Cyber Resiliency Technologies Development	Various	Various : Various	-	10.400	Nov 2020	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	38.516		28.303		8.265		-		8.265	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MITRE	Various	Various : Bedford, MA	-	3.000	Jan 2021	3.000	Jan 2022	3.000	Jan 2023	-		3.000	Continuing	Continuing	-
Defense Technical Information Center (DTIC)	Various	Various : Various	-	0.240	Jan 2021	0.240	Jan 2022	0.240	Jan 2023	-		0.240	Continuing	Continuing	-
		Subtotal	-	3.240		3.240		3.240		-		3.240	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
A&AS, Travel, Government Purchase Card	Various	Various : Various	-	5.950	Dec 2020	5.450	Dec 2021	5.614	Dec 2022	-		5.614	Continuing	Continuing	-
		Subtotal	-	5.950		5.450		5.614		-		5.614	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604414F / *Cyber Resiliency of Weapon Systems-ACS*	Project (Number/Name) 642834 / *Mitigations*	

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	47.706		36.993		17.119		-		17.119	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604414F / *Cyber Resiliency of Weapon Systems-ACS*	**Project (Number/Name)** 642834 / *Mitigations*

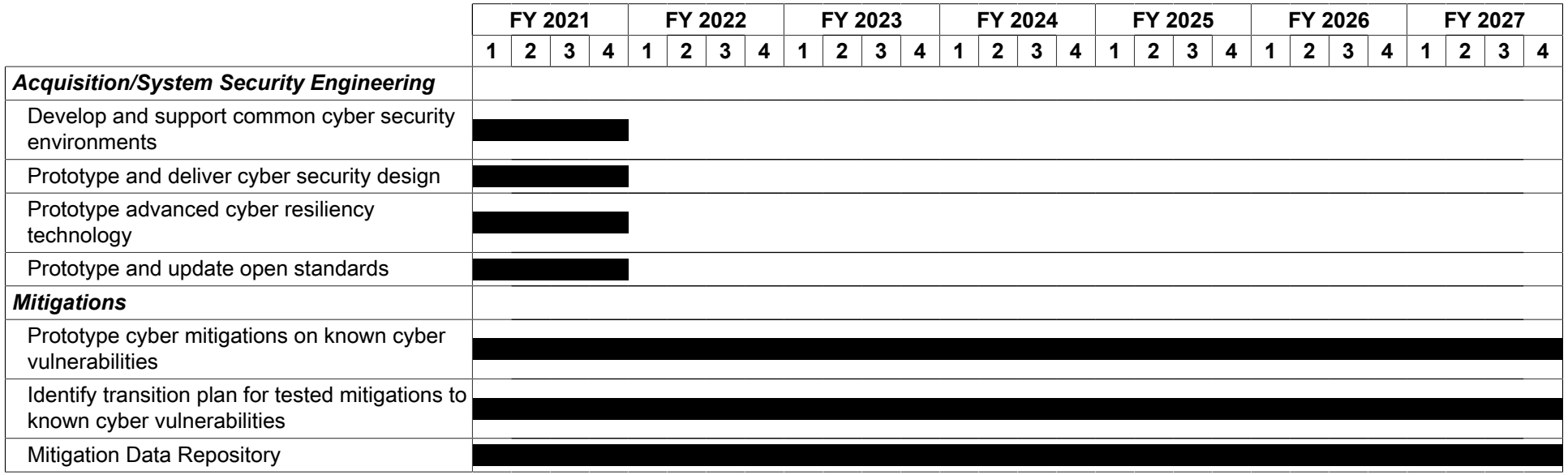

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604414F / *Cyber Resiliency of Weapon Systems-ACS*	**Project (Number/Name)** 642834 / *Mitigations*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Acquisition/System Security Engineering				
Develop and support common cyber security environments	1	2021	4	2021
Prototype and deliver cyber security design	1	2021	4	2021
Prototype advanced cyber resiliency technology	1	2021	4	2021
Prototype and update open standards	1	2021	4	2021
Mitigations				
Prototype cyber mitigations on known cyber vulnerabilities	1	2021	4	2027
Identify transition plan for tested mitigations to known cyber vulnerabilities	1	2021	4	2027
Mitigation Data Repository	1	2021	4	2027

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604414F / *Cyber Resiliency of Weapon Systems-ACS*	Project (Number/Name) 642836 / *Mission Risk Analysis*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
642836: *Mission Risk Analysis*	-	19.910	7.461	6.026	0.000	6.026	7.143	6.947	7.094	7.252	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Discover and analyze cyber susceptibilities/vulnerabilities to Department of the Air Force (DAF) weapon systems and characterize their impacts based on mission risk. Promote the enhancement of cyber discovery methodologies and capabilities within DAF. Focus is on assessing the gaps and seams that exist between defined weapon system boundaries and within areas that are not assigned to specific weapon system program offices. This activity builds upon existing efforts that identify and mitigate cyber vulnerabilities, and does not duplicate similar ongoing efforts or conduct redundant assessments on systems that have already been evaluated. As the Acquisition/ System Security Engineering activity under Project 642812 develops Cyber Focus Teams, additional, more robust assessment data sets will be generated for CROWS to continue identifying and validating vulnerabilities. This activity disseminates cyber risk information to inform acquisition decisions, provides feedback to focus future assessments and also feeds into the Mitigations activity under Project 642834.

The Acquisition/System Security Engineering (SSE) activity develops DAF and Department of Defense system security engineering and acquisition security processes, policies, and contracting language, and refines intelligence collection and processes to provide actionable information on cyber threats to the weapons system community. This project encompasses developing cyber resiliency training, manning strategies, and Cyber Focus Teams, which provide cyber acquisition expertise to Program Executive Offices (PEO) to address acquisition workforce gaps in cyber resiliency/security manpower, experience, and knowledge. This project hones workforce expertise and skills required to counter weapon system-unique cyber threats, which exceeds the knowledge needed to secure Internet Protocol (IP) based systems against traditional network-based cyber threats. Such expertise is critical for acquisition professionals to ensure cyber resiliency/security design tenets are integrated into the weapon system's life cycle. Finally, this project includes identification, evaluation, and prioritization of emerging cyber techniques, products, and technologies for further development and prototyping to posture DAF weapon systems to counter emerging threats. This activity supports DAF Program Offices, the Protecting Critical Technologies Task Force, Defense Industrial Base data protection efforts, DAF Supply Chain Risk Management, and other weapon system cyber security/resiliency activities as required.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver CROWS weapon system capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program element 0605827F, 0605828F, 0605831F, 0605832F, 0605833F, 0605898F, 0606398F. In FY 2021 $0.032 million was expended for civilian pay expenses in this program element, and in FY 2022 $0.725 million is forecasted for civilian pay expenses in this program element.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Cyber Mission Risk Analysis	19.910	7.461	6.026
Description: Discovers, analyzes and coordinates sharing of information in support of cyber risk discovery activities for DAF weapon systems.			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604414F / *Cyber Resiliency of Weapon Systems-ACS*	**Project (Number/Name)** 642836 / *Mission Risk Analysis*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY 2022 Plans: Continue to coordinate cyber vulnerability assessments and develop a capability to provide focused assessments where required. Continue developing solutions to find, assess, and share cyber vulnerabilities through an enterprise-level data analysis capability. Provide expertise body to continue support of the Cyber resiliency Support Team (CRST) to augment DoD cyber vulnerability assessment by providing subject matter expertise for ongoing discovery tasks. ***FY 2023 Plans:*** Continue to coordinate cyber vulnerability assessments and develop a capability to provide focused assessments where required. Continue developing solutions to find, assess, and share cyber vulnerabilities through an enterprise-level data analysis capability. Provide expertise body to continue support of the Cyber resiliency Support Team (CRST) to augment DoD cyber vulnerability assessment by providing subject matter expertise for ongoing discovery tasks. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The program decreased $1.435 million from FY 2022 to FY 2023. As a result, there will be limited capability to provide system security engineering support to DoD Strategic Cybersecurity Program assessments. This decrease will result in loss of operational IT perspective that is a critical component to rounding out SCP expertise shortfalls.			
Accomplishments/Planned Programs Subtotals	19.910	7.461	6.026

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

When possible, activities in this effort will leverage current competitively-awarded contracts. Additional necessary contracts funded in this program element will be awarded using either competitive or sole source procedures, whichever is most appropriate. The government agency responsible for managing the program is the Air Force Life Cycle Management Center, Cyber Resiliency Office for Weapons Systems, Wright-Patterson Air Force Base, Ohio and Hanscom Air Force Base, Massachusetts.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604414F / *Cyber Resiliency of Weapon Systems-ACS*	**Project (Number/Name)** 642836 / *Mission Risk Analysis*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Data Analytics and Aggregation Tool (DAAT)	Various	JJR Solutions : Dayton, OH	-	1.220	Jan 2021	4.720	Jan 2022	1.800	Jan 2023	-		1.800	Continuing	Continuing	-
Data Strategy	Various	Various : Various	-	5.677	Jan 2021	2.741	Jan 2022	4.226	Jan 2023	-		4.226	Continuing	Continuing	-
Intel collection skills to identify cyber threats to weapon systems	Various	Various : Various	-	4.343	Dec 2020	-		-		-		-	Continuing	Continuing	-
Education and Training	Various	Various : Various	-	1.050	Jan 2021	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	12.290		7.461		6.026		-		6.026	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Security Engineering requirements, policy and guidance documents (DTIC)	Various	Various : Various	-	0.460	Jan 2021	-		-		-		-	Continuing	Continuing	-
MITRE	Various	Various : Bedford, MA	-	4.410	Nov 2020	-		-		-		-	Continuing	Continuing	-
CMU/SEI	Various	Carnegie Mellon Univ : Pittsburgh, PA	-	1.000	Dec 2020	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	5.870		-		-		-		-	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
A&AS, Travel, Government Purchase Card	Various	Various : Various	-	1.750	Dec 2020	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	1.750		-		-		-		-	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604414F / *Cyber Resiliency of Weapon Systems-ACS*	Project (Number/Name) 642836 / *Mission Risk Analysis*	

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	19.910		7.461		6.026		-		6.026	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604414F / *Cyber Resiliency of Weapon Systems-ACS*	**Project (Number/Name)** 642836 / *Mission Risk Analysis*

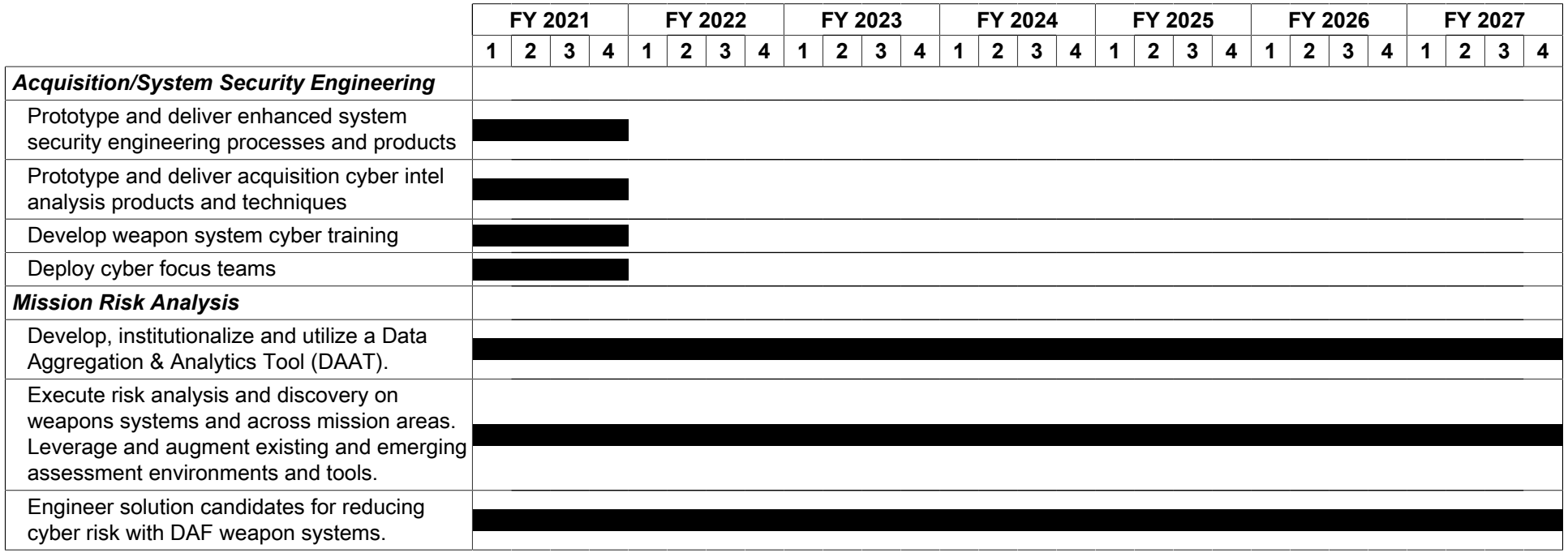

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604414F / *Cyber Resiliency of Weapon Systems-ACS*	**Project (Number/Name)** 642836 / *Mission Risk Analysis*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Acquisition/System Security Engineering				
Prototype and deliver enhanced system security engineering processes and products	1	2021	4	2021
Prototype and deliver acquisition cyber intel analysis products and techniques	1	2021	4	2021
Develop weapon system cyber training	1	2021	4	2021
Deploy cyber focus teams	1	2021	4	2021
Mission Risk Analysis				
Develop, institutionalize and utilize a Data Aggregation & Analytics Tool (DAAT).	1	2021	4	2027
Execute risk analysis and discovery on weapons systems and across mission areas. Leverage and augment existing and emerging assessment environments and tools.	1	2021	4	2027
Engineer solution candidates for reducing cyber risk with DAF weapon systems.	1	2021	4	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604668F / *Joint Transportation Management System (JTMS)*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	51.758	0.000	51.758	0.000	0.000	0.000	0.000	0.000	51.758
646682: *JTMS DEVELOPMENT*	-	0.000	0.000	51.758	0.000	51.758	0.000	0.000	0.000	0.000	0.000	51.758
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 4, PE 0604668F, project 646682, Joint Transportation Management System Acquisition/Development, is a new start.

In FY 2022, PE 0604776F, (Deployment & Distribution R&D), Project 640212, (C2/Optimization/Modeling and Simulation) efforts were transferred to PE 0604668F, (Joint Tranportation Management System (JTMS) Development), Project 646682 in order to provide transparency.

A. Mission Description and Budget Item Justification

This initiative provides an overarching solution to reform functional financial and logistics capabilities within the Transportation of Things and is aimed at the third pillar of the 2018 National Defense Strategy—business reform. The program will deliver integrated, streamlined transportation and financial data and processes, supporting the Joint Deployment and Distribution Enterprise (JDDE). Services and DoD agencies will have a system to automate the linkage between transportation action tasks and transportation business related tasks across the full spectrum of financial activity, from obligations through general ledger accounting. It will also close all major gaps that prevent auditability within the transportation spend across DoD and achieve significant gains in two of the focus areas of the Department of Defense's Data Strategy: Senior Leader Decision Support and Business Analytics. Through the TMS's ability to seamlessly integrate financial data and information with transportation operations in the joint domain, it will give JDDE users the ability to see to the transactional level in a resilient transportation network while reducing duplicate capabilities.

The remainder of the FYDP funding will be pursued through the FY24-FY28 POM.

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 FY2021 $0 was expended for civilian pay expenses in this program element, and in FY2022 $0 is forecasted for civilian pay expenses in this program element.

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604668F / *Joint Transportation Management System (JTMS)*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	51.758	0.000	51.758
Total Adjustments	0.000	0.000	51.758	0.000	51.758
• 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	51.758	0.000	51.758

Change Summary Explanation

In FY22, 15.5M was placed in PE0604776F (Deployment & Distribution R&D) until a separate PE could be established. This submission includes 51.758M in support of unchanged FY23 requirements. The remainder of the FYDP funding will be pursued through the FY24-FY28 POM.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Joint Transportation Management System Acquisition/Development	0.000	0.000	51.758	0.000	51.758

Description: Engage in key pre-acquisition activities to support a projected FY23 prime integrator award including but not limited to drafting or executing key management plans and the programmatic activities required to inform the acquisition such as Project Management, Configuration Management, Risk Management, Release Management, Testing, and Training. Solution analysis and recommendations to the Functional Sponsor as a result of a planned analysis of alternatives will be completed early in FY23 to support the projected prime integrator award. If required in FY23, procure and establish the appropriate hosting environment lead time away to support the chosen materiel solution and initiate accreditation activities per the required Risk Management Framework (RMF) classification.

FY 2022 Plans:

N/A

FY 2023 Base Plans:

Engage in pre-acquisition activities including standing up the JPO and conducting the lead time away work required with respect to business process re-engineering and organizational change management necessary to

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604668F / *Joint Transportation Management System (JTMS)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
build the groundwork for the recommended solution pending analysis of alternatives results. Engage in market research and other pre-solicitation activities necessary to support a prime award in 3rd quarter FY23. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A					
Accomplishments/Planned Programs Subtotals	0.000	0.000	51.758	0.000	51.758

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

Follow the DoD Instruction 5000.75 process for Business Systems Requirements and Acquisition. The program will utilize various contracts (where appropriate) to reform financial and transportation processes within the Transportation of Things.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604668F / *Joint Transportation Management System (JTMS)*	Project (Number/Name) 646682 / *JTMS DEVELOPMENT*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Joint Transportation System Acquisition/ Development	C/TBD	TBD : Scott AFB, IL	-	-		-		24.334	Apr 2023	-		24.334	Continuing	Continuing	24.334
		Subtotal	-	-		-		24.334		-		24.334	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Pre Acquisition Support	C/Various	TBD : Scott AFB, IL	-	-		-		6.460		-		6.460	Continuing	Continuing	6.460
		Subtotal	-	-		-		6.460		-		6.460	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Joint Program Office Support	C/Various	TBD : Scott AFB, IL	-	-		-		20.964	Oct 2022	-		20.964	Continuing	Continuing	20.964
		Subtotal	-	-		-		20.964		-		20.964	Continuing	Continuing	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		-		51.758		-		51.758	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604668F / *Joint Transportation Management System (JTMS)*	**Project (Number/Name)** 646682 / *JTMS DEVELOPMENT*

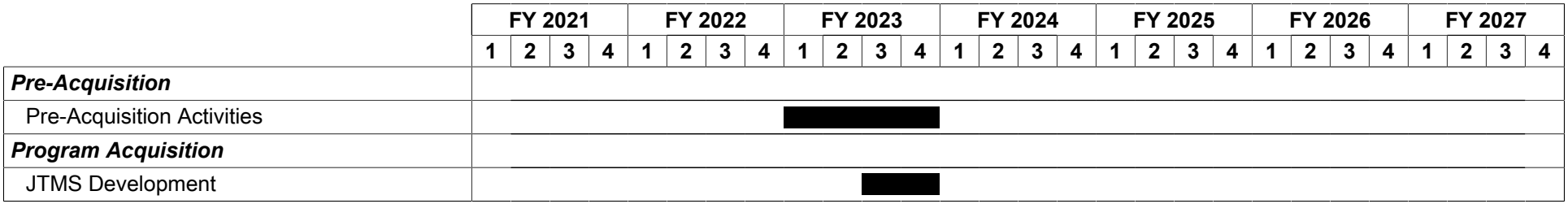

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604668F / *Joint Transportation Management System (JTMS)*	**Project (Number/Name)** 646682 / *JTMS DEVELOPMENT*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Pre-Acquisition				
Pre-Acquisition Activities	1	2023	4	2023
Program Acquisition				
JTMS Development	3	2023	4	2023

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0604776F / *Deployment & Distribution Enterprise R&D*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	25.474	40.103	27.586	0.000	27.586	31.761	32.353	33.035	33.769	Continuing	Continuing
640211: *GLOBAL ACCESS*	-	5.633	9.484	7.071	0.000	7.071	8.247	8.400	8.579	8.769	Continuing	Continuing
640212: *C2/OPTIMIZATION/ MODELING AND SIMULATION*	-	14.412	24.958	15.587	0.000	15.587	17.646	17.975	18.352	18.760	Continuing	Continuing
640213: *CYBER*	-	5.429	5.461	4.928	0.000	4.928	5.868	5.978	6.104	6.240	Continuing	Continuing
640215: *Transportation Management Service*	-	0.000	0.200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.200

Note

This program, BA 4, PE 0604776F, project 640211, Aerial Delivery Platform, is a new start.
This program, BA 4, PE 0604776F, project 640211, Modular Autonomous Ready Dynamic Positioning System, is a new start.
This program, BA 4, PE 0604776F, project 640212, Analyzer Driven Data Integrity, is a new start.
This program, BA 4, PE 0604776F, project 640212, Strategic Theater Orchestration and Resource Management, is a new start.
This program, BA 4, PE 0604776F, project 640212, Risk Assessment and Vetting for the Enterprise, is a new start.
This program, BA 4, PE 0604776F, project 640212, Component Level Operational Decision Advantage, is a new start.
This program, BA 4, PE 0604776F, project 640212, JDDE Mission Assurance Coordinator, is a new start.

A. Mission Description and Budget Item Justification

This program provides for the development, integration, demonstration and detailed assessment of capabilities which improve deployment, distribution and supply chain decision-making/collaboration (e.g., planning stage to real-time execution/retrograde operations) without need for highly specialized operators. Projects in this area address the following: decision support tools, distribution process simulations/analytics, distribution demand forecasting/execution monitoring, automated decision-maker support (e.g., queuing, alerting, courses of action), automated status monitoring with information fusion to include drilldown capability, and resilient Command & Control (C2) infrastructure capabilities. Current planning, forecasting, and collaboration capabilities do not permit full synchronization of people, processes and assets to execute planned operations. Automated tools must be able to dynamically analyze/predict demand and provide input to advanced distribution planning systems to include the capability for Combatant Commanders to manage theater transportation operations from the port of debarkation to the point of need. Transportation information exchange across the DOD is inhibited by disparate systems, multiple data standards and insufficient interfaces. The ability to rapidly determine the impact of any delays/ changes and conduct "what-if" impact assessments on the closure of force packages is required. This project addresses the required mission support to combatant commanders and other customers in the area of C2, Optimization, and Modeling and Simulations.

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,

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604776F / *Deployment & Distribution Enterprise R&D*

0606398F. In FY21 0M was expended for civilian pay expenses in this program element (PE). In FY22, Joint Transportation Management System (JTMS) 15.5M was placed in this PE, for civilian pay expenses, until a separate PE could be established. No other FY will include civilian pay expenses in this PE.

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

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	25.788	40.103	0.000	0.000	0.000
Current President's Budget	25.474	40.103	27.586	0.000	27.586
Total Adjustments	-0.314	0.000	27.586	0.000	27.586
• 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	-0.314	0.000			
• Other Adjustments	0.000	0.000	27.586	0.000	27.586

Change Summary Explanation

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604776F / *Deployment & Distribution Enterprise R&D*	Project (Number/Name) 640211 / *GLOBAL ACCESS*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
640211: *GLOBAL ACCESS*	-	5.633	9.484	7.071	0.000	7.071	8.247	8.400	8.579	8.769	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 4, PE 0604776F, project 640211, Aerial Delivery Platform, is a new start.
This program, BA 4, PE 0604776F, project 640211, Modular Autonomous Ready Dynamic Positioning System, is a new start.

A. Mission Description and Budget Item Justification

This program provides for the development, integration, demonstration and detailed assessment of DOD procedures/technologies targeted at optimizing throughput at the nodes as well as across the conduits of the deployment and distribution supply chains, from origin to point of use as well as return. Needed capabilities include inventory/cargo management, materiel handling innovations, improved physical node access, port throughput improvements, innovative delivery methods (e.g., precision airlift, autonomous re-supply), and cargo/container security. This project addresses required mission support to combatant commanders and other customers of DOD's distribution and transportation systems in the area of deployment/distribution velocity management, manned/unmanned systems to the point of effect, and increased global reach in austere/anti-access environments.

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. In FY21 0M was expended for civilian pay expenses in this program element (PE). In FY22, Joint Transportation Management System (JTMS) 15.5M was placed in this PE, for civilian pay expenses, until a separate PE could be established. No other FY will include civilian pay expenses in this PE.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Petroleum Undersea Sustainment Hose	0.400	0.450	0.250
Description: Provide an agile, submersible over-the-shore conduit that can be pre-positioned or immediately employed from vessels of opportunity such as a commercial offshore supply vessel (OSV).			
FY 2022 Plans: Addresses Sea Basing Technologies/Logistics-Over-The-Shore need to enhance the Joint Force Commander's flexibility			
FY 2023 Plans: Addresses Sea Basing Technologies/Logistics-Over-The-Shore need to enhance the Joint Force Commander's flexibility			
FY 2022 to FY 2023 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604776F / *Deployment & Distribution Enterprise R&D*	**Project (Number/Name)** 640211 / *GLOBAL ACCESS*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Development requirement decreases			
Title: Collision Avoidance and Navigation Insight System/Aerial Port of the Furture ***Description:*** Autonomous Technologies applied to the 60K Tunner to improve throughput and safety ***FY 2022 Plans:*** Funding will test semi autonomous technologies ***FY 2023 Plans:*** Funding will develop future airport automation ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease in development requirement	0.605	1.612	0.820
Title: Submersible Matting ***Description:*** Develop a submersible matting system (SUBMAT) to facilitate mobility across the shoreline and wet/dry gaps by combining current soil stability technology and mobility matting into a single product. ***FY 2022 Plans:*** Design for manufacture analysis and preliminary fabrication ***FY 2023 Plans:*** Build for manufacture analysis and preliminary fabrication ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease in development requirements	0.300	0.700	0.500
Title: Rapid Available Interface for trans-Loading ***Description:*** Provides a process to rapidly assess the condition, design acceptable repairs and delivers pre-kitted rail repair and retrofit solutions. The standardized repair kits allows for the development of Tactics, Techniques and Procedures (TTPs) for each repair that can be scaled to address a range of damages. ***FY 2022 Plans:*** Work will identify and develop a robotic survey vehicle integrated with rail condition survey equipment. ***FY 2023 Plans:***	0.150	2.000	0.500

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604776F / *Deployment & Distribution Enterprise R&D*	**Project (Number/Name)** 640211 / *GLOBAL ACCESS*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Work will identify and develop a robotic survey vehicle integrated with rail condition survey equipment. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease in development requirements			
Title: Repair and Retrofit of Railway Systems ***Description:*** The standardized repair kits allows for the development of Tactics, Techniques and Procedures (TTPs) for each repair that can be scaled to address a range of damages. ***FY 2022 Plans:*** Work will identify and develop a robotic survey vehicle integrated with rail condition survey equipment. ***FY 2023 Plans:*** Work will identify and develop a robotic survey vehicle integrated with rail condition survey equipment.	0.500	0.750	0.750
Title: Drone Supported Surface Deployment ***Description:*** Determine the suitability of using modern drones and drone mapping technology for capturing data for input to systems such as the Integrated Computerized Deployment System (ICODES) and the Transportation Geospatial Information System (TGIS) ***FY 2022 Plans:*** Will analyze RFID Hardware, Middleware and Software ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A	0.348	0.250	-
Title: Buoyant Roll On/Roll Off Interface Kit ***Description:*** Prototype consisting of the RO/RO ramp to interface to a commercial supply vessel and a section of floating causeway and ancillary equipment sufficient to conduct a limited operational assessment ***FY 2022 Plans:*** Developing a prototype rapidly deployable ship-to-shore connector capability ***FY 2023 Plans:*** Continue to develop a prototype rapidly deployable ship-to-shore connector capability ***FY 2022 to FY 2023 Increase/Decrease Statement:***	0.600	1.800	0.400

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604776F / *Deployment & Distribution Enterprise R&D*	**Project (Number/Name)** 640211 / *GLOBAL ACCESS*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Decrease in development requirements			
Title: 35 Thousand Foot Airdrop ***Description:*** Develop capabilities to airdrop from 35 thousand feet to increase aircraft standoff range from threat. ***FY 2022 Plans:*** Working parafoil and parachute technologies ***FY 2023 Plans:*** Continuing to work parafoil and parachute technologies ***FY 2022 to FY 2023 Increase/Decrease Statement:*** NA	0.650	0.500	0.500
Title: Interoperable Multi-modal Patient Movement ***Description:*** Create system to move mass causalities when air medivac is not available ***FY 2022 Plans:*** Ends FY21 ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Ends FY21	0.410	0.000	-
Title: Replenishment from Ships to Point of Need Delivery/AIRADE ***Description:*** Unmanned system launched from ships and capable of carrying supplies up to 100 miles inland. ***FY 2022 Plans:*** Developing technologies to support required payloads and distances ***FY 2023 Plans:*** Continue development of technologies to support required payloads and distances ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Development Schedule requirement increase	0.750	0.350	0.625
Title: Use of Dual Row Airdrop System with Joint Light Tactical Vehicle ***Description:*** Increasing the strength of C-17 dual row rails to enable dropping the JLTV	0.198	0.602	0.820

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604776F / *Deployment & Distribution Enterprise R&D*	**Project (Number/Name)** 640211 / *GLOBAL ACCESS*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY 2022 Plans: Applying technologies and testing results ***FY 2023 Plans:*** Continuing to apply technologies and test results ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Development Schedule requirement increase			
Title: Enhanced Vision Navigation for Joint Precision Airdrop System ***Description:*** Advanced technologies to improve airdrop capabilities to the warfighter. ***FY 2022 Plans:*** Working technologies to improve airdrop capabilities ***FY 2023 Plans:*** Continuing to work technologies to improve airdrop capabilities ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Development schedule requirement increases	0.372	0.320	0.520
Title: Expeditionary End-to-End Fueling Concept ***Description:*** Addressing gap in theater fuel delivery/distribution capabilities to inform the development of the Army Early Entry Fluid Distribution System as well as provide a development path for Navy/USMC ship-to-shore capabilities. ***FY 2022 Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A	0.150	0.000	-
Title: Autonomous Drone Delivery from Airdrop Systems ***Description:*** An air-droppable Unmanned Aircraft System (UAS) to conduct resupply missions in densely populated urban areas. ***FY 2022 Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:***	0.100	0.000	-

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604776F / *Deployment & Distribution Enterprise R&D*	**Project (Number/Name)** 640211 / *GLOBAL ACCESS*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
N/A			
Title: Aerial Delivery Platform ***Description:*** Platform for air dropping mutiple vehicles ***FY 2023 Plans:*** Will design platform ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY23 new start	-	-	0.499
Title: Modular Autonomous Ready Dynamic Positioning System ***Description:*** Position for sealift lighterage assets ***FY 2022 Plans:*** N/A ***FY 2023 Plans:*** Will develop a positioning system for sealift lighterage assets ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY23 New Start	-	0.000	0.387
Title: Resilient Expeditionary Agile Littoral Logistics ***Description:*** Transfer of fuel ashore from various conveyances from off-shore platform ***FY 2022 Plans:*** Funding technology development of fuel transfer ***FY 2023 Plans:*** Continue technology development of fuel transfer ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Development requirement schedule increase	0.100	0.150	0.500
Accomplishments/Planned Programs Subtotals	5.633	9.484	7.071

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604776F / *Deployment & Distribution Enterprise R&D*	**Project (Number/Name)** 640211 / *GLOBAL ACCESS*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

Requirements for joint deployment and distribution enterprise technology enhancements are annually identified, validated and prioritized by the Joint Deployment & Distribution Enterprise (JDDE) community. Pursuit of the development of new capabilities to meet these requirements is managed by the United States Transportation Command (USTRANSCOM). Prototype products, once evaluated by the users, are spirally transitioned by the operational community.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604776F / *Deployment & Distribution Enterprise R&D*	Project (Number/Name) 640211 / *GLOBAL ACCESS*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support	Various	Various : Belleville, IL	-	5.633	Nov 2020	9.484	Nov 2021	7.071	Nov 2022	-		7.071	Continuing	Continuing	-
		Subtotal	-	5.633		9.484		7.071		-		7.071	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	5.633		9.484		7.071		-		7.071	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604776F / *Deployment & Distribution Enterprise R&D*	**Project (Number/Name)** 640211 / *GLOBAL ACCESS*

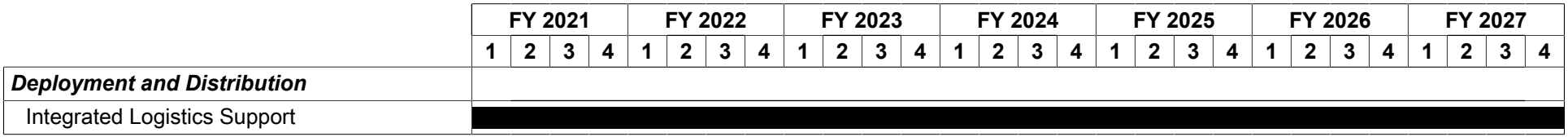

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604776F / *Deployment & Distribution Enterprise R&D*	**Project (Number/Name)** 640211 / *GLOBAL ACCESS*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Deployment and Distribution				
Integrated Logistics Support	1	2021	4	2027

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604776F / *Deployment & Distribution Enterprise R&D*	Project (Number/Name) 640212 / *C2/OPTIMIZATION/MODELING AND SIMULATION*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
640212: *C2/OPTIMIZATION/ MODELING AND SIMULATION*	-	14.412	24.958	15.587	0.000	15.587	17.646	17.975	18.352	18.760	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 4, PE 0604776F, project 640212, Analyzer Driven Data Integrity, is a new start.
This program, BA 4, PE 0604776F, project 640212, Strategic Theater Orchestration and Resource Management, is a new start.
This program, BA 4, PE 0604776F, project 640212, Risk Assessment and Vetting for the Enterprise, is a new start.
This program, BA 4, PE 0604776F, project 640212, Component Level Operational Decision Advantage, is a new start.
This program, BA 4, PE 0604776F, project 640212, JDDE Mission Assurance Coordinator, is a new start.

A. Mission Description and Budget Item Justification

This program provides for the development, integration, demonstration and detailed assessment of capabilities which improve deployment, distribution and supply chain decision-making/collaboration (e.g., planning stage to real-time execution/retrograde operations) without need for highly specialized operators. Projects in this area address the following: decision support tools, distribution process simulations/analytics, distribution demand forecasting/execution monitoring, automated decision-maker support (e.g., queuing, alerting, courses of action), automated status monitoring with information fusion to include drilldown capability, and resilient Command & Control (C2) infrastructure capabilities. Current planning, forecasting, and collaboration capabilities do not permit full synchronization of people, processes and assets to execute planned operations. Automated tools must be able to dynamically analyze/predict demand and provide input to advanced distribution planning systems to include the capability for Combatant Commanders to manage theater transportation operations from the port of debarkation to the point of need. Transportation information exchange across the DOD is inhibited by disparate systems, multiple data standards and insufficient interfaces. The ability to rapidly determine the impact of any delays/changes and conduct "what-if" impact assessments on the closure of force packages is required. This project addresses the required mission support to combatant commanders and other customers in the area of C2, Optimization, and Modeling and Simulations. The Joint Transportation Management System (JTMS) will develop and configure a commercial-off-the-shelf (COTS) transportation/financial management product to deliver DoD enterprise-wide end-to-end transportation and transportation-related financial business process reform.

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. In FY21 0M was expended for civilian pay expenses in this program element (PE). In FY22, Joint Transportation Management System (JTMS) 15.5M was placed in this PE, for civilian pay expenses, until a separate PE could be established. No other FY will include civilian pay expenses in this PE.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: TRANSCOM Innovation	3.498	16.924	4.006

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604776F / *Deployment & Distribution Enterprise R&D*	**Project (Number/Name)** 640212 / *C2/OPTIMIZATION/MODELING AND SIMULATION*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Description: Rapidly develop and integrate technology solutions for the enterprise ***FY 2022 Plans:*** Continue to pursue and develop solutions to identified challenges ***FY 2023 Plans:*** Continue to pursue and develop solutions to identified challenges ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Development schedule decrease			
Title: Space X Support ***Description:*** Support the development of space logistics ***FY 2022 Plans:*** ended in FY21 ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A	0.179	0.000	-
Title: Ares Dynamic Network Automation ***Description:*** Support plans that are released on unclassified, untrusted commercial networks in order to solicit and contract with vendors capable of supplying theater forces. ***FY 2022 Plans:*** Funding will allow permissioned transactional blockchain network integrated with an identity blockchain that controls access ***FY 2023 Plans:*** Funding will allow permissioned transactional blockchain network integrated with an identity blockchain that controls access ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Development varies by FY. Requirement increased in FY23	-	0.446	0.891
Title: Resilient Logistics JCTD ***Description:*** Deliver logistical deception kits to confuse and deny enemy Intelligence, Surveillance, Reconnaissance (ISR) ***FY 2022 Plans:***	0.000	0.200	-

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604776F / *Deployment & Distribution Enterprise R&D*	**Project (Number/Name)** 640212 / *C2/OPTIMIZATION/MODELING AND SIMULATION*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Funding will allow development of deception kits ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Effort ends FY22			
Title: Air Refueling Optimization ***Description:*** System managing the various phases of the Air Refueling (AR) fleet management, validation, allocation and execution process. ***FY 2022 Plans:*** Funding will continue development of opportunities that the current A/R planning systems lack: optimization algorithms that provide a range of strategic decision space ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Effort ends FY22	0.600	0.200	-
Title: Safety Analysis of Modified Midwest Guardrail ***Description:*** Research and physical testing to gather and analyze data for improving Entry Control Facilities (ECF) design and operations, improve road safety on installations, and reduce overall costs ***FY 2022 Plans:*** Funding will establish entry control facilities ECF guardrail standards to mitigate terrorism/asymmetric threats ***FY 2023 Plans:*** Funding will establish entry control facilities ECF guardrail standards to mitigate terrorism/asymmetric threats ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Effort ends FY22	0.000	0.800	0.350
Title: Data Lake ***Description:*** Develop and demonstrate the capability that allows incongruent data to be brought together to provide automated decision support. ***FY 2022 Plans:*** Funding will continue data analytics development ***FY 2023 Plans:***	0.372	0.900	1.150

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604776F / *Deployment & Distribution Enterprise R&D*	**Project (Number/Name)** 640212 / *C2/OPTIMIZATION/MODELING AND SIMULATION*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Funding will permit increase in data management ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase in development schedule			
Title: End-to-End Deployment and Distribution Modeling ***Description:*** Provide an integrated deployment/distribution environment to provide continuous and optimal balancing of total demand verse capacity from planning through mission execution. ***FY 2022 Plans:*** Funding will allow model deployment and distribution ***FY 2023 Plans:*** Funding will allow model deployment and distribution ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding skipped a year due to development schedule	2.600	0.000	0.350
Title: Massachusetts Institute of Technology Lincoln Labs ***Description:*** Partnership with MIT-LL to research efforts to improve enterprise operational architecture supporting high-end analytics, integrated information technology/data structures, understanding of cloud capabilities and multi-level cyber security defense. ***FY 2022 Plans:*** Continue effective secure operations enabled via data fusion frameworks and prototypes. ***FY 2023 Plans:*** Effort ends FY22 ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase in development schedule	4.328	2.302	3.650
Title: Modeling & Simulation Innovation ***Description:*** Select student research/faculty-assisted projects (e.g., Joint Transportation Asset Scheduling Kit, Next Generation Cargo Capability, Applying Post Modern Portfolio Theory to Mitigate Risk in International Shipping, Optimal CH-47/C-130 Workload Balance, Remotely Piloted Aircraft Performing Airdrop Mission). ***FY 2022 Plans:***	0.161	0.089	0.125

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604776F / *Deployment & Distribution Enterprise R&D*	**Project (Number/Name)** 640212 / *C2/OPTIMIZATION/MODELING AND SIMULATION*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Collaboration partnership with AFIT for student research ***FY 2023 Plans:*** Collaboration partnership with AFIT for student research ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Development varies by FY Increase in FY23			
Title: Infrastructure Information Confidence Model ***Description:*** Inform decision makers of the quality of primary and alternate data sources they are using to make decisions ***FY 2022 Plans:*** N/A ***FY 2023 Plans:*** Increase model capability ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease in development schedule	0.697	0.636	0.434
Title: Aerial Delivery and Autonomous Deployment of Unmanned Vehicles ***Description:*** Develop ability to deliver unmanned systems from existing airdrop systems ***FY 2022 Plans:*** Aerial Delivery and Autonomous Deployment of Unmanned Vehicles ***FY 2023 Plans:*** Aerial Delivery and Autonomous Deployment of Unmanned Vehicles ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Development schedule increase	0.000	0.828	1.010
Title: Program Execution ***Description:*** Provide technical assistance and program management support to the USTRANSCOM RDT&E Program. ***FY 2022 Plans:***	0.977	1.120	1.150

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604776F / *Deployment & Distribution Enterprise R&D*	**Project (Number/Name)** 640212 / *C2/OPTIMIZATION/MODELING AND SIMULATION*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
TRL 4-6: Program support to explore technology solutions to capability gaps identified through Joint Concept Development documents, the Joint capabilities Integration and Development System process, Joint Experimentation, etc, to increase the responsiveness, efficiency and effectiveness of the Joint Deployment and Distribution Enterprise. ***FY 2023 Plans:*** TRL 4-6: Program support to explore technology solutions to capability gaps identified through Joint Concept Development documents, the Joint capabilities Integration and Development System process, Joint Experimentation, etc, to increase the responsiveness, efficiency and effectiveness of the Joint Deployment and Distribution Enterprise. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Development schedule increase			
Title: Scheduling Mobility Aircrews for Readiness and Transportation ***Description:*** Develop prototype software for advanced squadron scheduling, collaboration, and predictive modeling. ***FY 2022 Plans:*** Continue to Develop prototype software for advanced squadron scheduling, collaboration, and predictive modeling. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Effort ends FY22	0.700	0.513	-
Title: Analyzer Driven Data Integrity ***Description:*** Increase data integrity ***FY 2023 Plans:*** begin plan design ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY23 New Start	-	-	0.238
Title: Strategic Theater Orchestration and Resource Management ***Description:*** Ability to manage theater lift assets ***FY 2023 Plans:*** Begin system design ***FY 2022 to FY 2023 Increase/Decrease Statement:***	-	-	0.615

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604776F / *Deployment & Distribution Enterprise R&D*	**Project (Number/Name)** 640212 / *C2/OPTIMIZATION/MODELING AND SIMULATION*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY23 new start			
Title: Risk Assessment and Vetting for the Enterprise ***Description:*** Assessing deployment distribution risk ***FY 2023 Plans:*** Begin design phase ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY23 new start	-	-	0.700
Title: Component Level Operational Decision Advantage ***Description:*** develop detailed decision support tool ***FY 2023 Plans:*** Begin design plans ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY23 new start	-	-	0.500
Title: JDDE Mission Assurance Coordinator ***Description:*** Develop a JDDE-wide method for mission coordination ***FY 2023 Plans:*** Begin design development ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY23 new start	-	-	0.418
Title: Modeling Dynamics of Modular Causeways to Improve Debarkation Sites ***Description:*** High-fidelity model to provide planners with precise knowledge of Modular Causeway behavior. ***FY 2022 Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:***	0.300	0.000	-

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604776F / *Deployment & Distribution Enterprise R&D*	**Project (Number/Name)** 640212 / *C2/OPTIMIZATION/MODELING AND SIMULATION*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Effort ended in FY21			
Accomplishments/Planned Programs Subtotals	14.412	24.958	15.587

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Requirements for joint deployment and distribution enterprise technology enhancements are annually identified, validated and prioritized by the Joint Deployment & Distribution Enterprise (JDDE) community. Pursuit of the development of new/improved capabilities to meet these requirements is managed by the United States Transportation Command (USTRANSCOM). Prototype products, once evaluated by the users, are spirally transitioned by the operational community.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604776F / *Deployment & Distribution Enterprise R&D*	Project (Number/Name) 640212 / *C2/OPTIMIZATION/MODELING AND SIMULATION*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support	Various	Various : Belleville, IL	-	14.412	Nov 2020	24.958	Nov 2021	15.587	Nov 2022	-		15.587	Continuing	Continuing	-
		Subtotal	-	14.412		24.958		15.587		-		15.587	Continuing	Continuing	N/A

Remarks

Funds will be realigned within PE.

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	14.412		24.958		15.587		-		15.587	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604776F / *Deployment & Distribution Enterprise R&D*	**Project (Number/Name)** 640212 / *C2/OPTIMIZATION/MODELING AND SIMULATION*

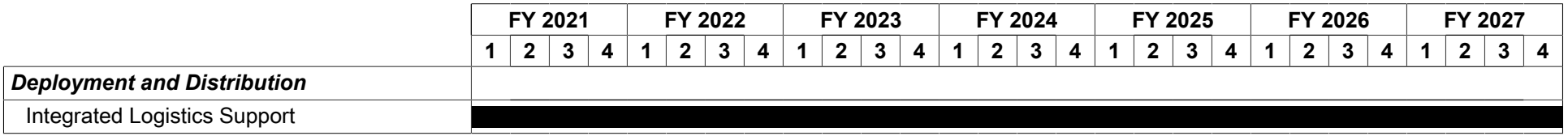

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604776F / *Deployment & Distribution Enterprise R&D*	**Project (Number/Name)** 640212 / *C2/OPTIMIZATION/MODELING AND SIMULATION*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Deployment and Distribution				
Integrated Logistics Support	1	2021	4	2027

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604776F / *Deployment & Distribution Enterprise R&D*	Project (Number/Name) 640213 / *CYBER*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
640213: *CYBER*	-	5.429	5.461	4.928	0.000	4.928	5.868	5.978	6.104	6.240	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program provides for the development, integration, demonstration and detailed assessment of capabilities to ensure USTRANSCOM mission assurance is in a persuasive/dynamic cyber environment. USTRANSCOM requires the procedures/technologies to improve cyber surveillance and control of networks across multiple domains and the ability to continue critical network operations in contested unclassified and classified network environments. The Command also needs the ability to differentiate between valid/unauthorized users and determine/quantify the trustworthiness of hardware/software systems. Additionally USTRANSCOM must have the ability to rapidly analyze & correlate data regarding malicious activities, select/evoke real-time defense actuators, perform automated reasoning capabilities that address data quality issues, and the ability to rapidly return to a known/safe operating state.

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. In FY21 0M was expended for civilian pay expenses in this program element (PE). In FY22, Joint Transportation Management System (JTMS) 15.5M was placed in this PE, for civilian pay expenses, until a separate PE could be established. No other FY will include civilian pay expenses in this PE.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Oversight	-	0.665	2.330
Description: Enable continuous tracking of adversary cyber groups and campaigns targeting USTRANSCOM and USINDOPACOM enterprise and their partners			
FY 2022 Plans: Funding will provide anomaly detection and predictive analysis to dynamically assess threats, attack vectors and adversary intent			
FY 2023 Plans: Funding will provide anomaly detection and predictive analysis to dynamically assess threats, attack vectors and adversary intent			
FY 2022 to FY 2023 Increase/Decrease Statement: R&D Development schedule increase			
Title: Cyber Mission Assurance Technologies	-	0.590	2.598
Description: Near real-time understanding of the operational impact of cyber risks, threats, and disruptions.			
FY 2022 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604776F / *Deployment & Distribution Enterprise R&D*	**Project (Number/Name)** 640213 / *CYBER*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Funding will develop integrated analysis/decision processes involving complex ops/cyber data by selecting pre-approved actions and coordinating stakeholders in the fight-through of cyber risks/disruptions to executing missions and Cyber Critical Asset Lists ***FY 2023 Plans:*** Funding will develop integrated analysis/decision processes involving complex ops/cyber data by selecting pre-approved actions and coordinating stakeholders in the fight-through of cyber risks/disruptions to executing missions and Cyber Critical Asset Lists ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Development schedule increase			
Title: Lincoln Labs ***Description:*** Partnership with MIT-LL to research efforts to improve enterprise operational architecture supporting high-end analytics, integrated information technology/data structures, understanding of cloud capabilities and multi-level cyber security defense. ***FY 2022 Plans:*** Continue increased awareness and ability to respond to cyber events ***FY 2022 to FY 2023 Increase/Decrease Statement:*** NA	5.429	4.206	-
Accomplishments/Planned Programs Subtotals	5.429	5.461	4.928

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Requirements for joint deployment and distribution enterprise technology enhancements are annually identified, validated and prioritized by the Joint Deployment & Distribution Enterprise (JDDE) community. Pursuit of the development of new/improved capabilities to meet these requirements is managed by the United States Transportation Command (USTRANSCOM). Prototype products, once evaluated by the users, are spirally transitioned by the operational community.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604776F / *Deployment & Distribution Enterprise R&D*	**Project (Number/Name)** 640213 / *CYBER*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support	Various	Various : Belleville, IL	-	5.429	Nov 2020	5.461	Nov 2022	4.928	Nov 2022	-		4.928	Continuing	Continuing	-
		Subtotal	-	5.429		5.461		4.928		-		4.928	Continuing	Continuing	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	5.429		5.461		4.928		-		4.928	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604776F / *Deployment & Distribution Enterprise R&D*	**Project (Number/Name)** 640213 / *CYBER*

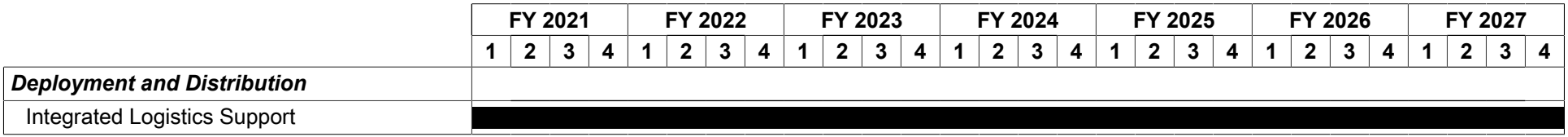

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604776F / *Deployment & Distribution Enterprise R&D*	**Project (Number/Name)** 640213 / *CYBER*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Deployment and Distribution				
Integrated Logistics Support	1	2021	4	2027

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604776F / *Deployment & Distribution Enterprise R&D*	Project (Number/Name) 640215 / *Transportation Management Service*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
640215: *Transportation Management Service*	-	0.000	0.200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.200
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Joint Transportation Management Systems (JTMS) added to support FY22 development.

A. Mission Description and Budget Item Justification

JTMS will develop and configure a commercial-off-the-shelf (COTS) transportation/financial management product to deliver DoD enterprise-wide end-to-end transportation and transportation-related financial business process reform.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Transportation Financial Product Development	0.000	0.200	0.000
Description: JTMS will develop and configure a commercial-off-the-shelf (COTS) transportation/financial management product to deliver DoD enterprise-wide end-to-end transportation and transportation-related financial business process reform. ***FY 2022 Plans:*** Develop a transportation-related financial business process reform. ***FY 2023 Plans:*** R&D Development ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Development schedule			
Accomplishments/Planned Programs Subtotals	0.000	0.200	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604776F / *Deployment & Distribution Enterprise R&D*	**Project (Number/Name)** 640215 / *Transportation Management Service*

D. Acquisition Strategy

Reforms the Defense Transportation System (DTS) by integrating financial and transportation transactions at the transactional level to effectively manage resources through a transportation requirement's plan to pay lifecycle. Program will improve resource management and budgeting accuracy, maximize buying power, strengthen financial management decision-making, and improve the Department's effort to achieve auditability.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604776F / *Deployment & Distribution Enterprise R&D*	**Project (Number/Name)** 640215 / *Transportation Management Service*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support	Various	Belleville, IL : IL	-	-		0.200	Nov 2021	0.000	Nov 2022	-		0.000	Continuing	Continuing	-
		Subtotal	-	-		0.200		0.000		-		0.000	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		0.200		0.000		-		0.000	Continuing	Continuing	N/A

Remarks

DoD enterprise end-to-end transportation and transportation-related financial business process reform.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604776F / *Deployment & Distribution Enterprise R&D*	**Project (Number/Name)** 640215 / *Transportation Management Service*

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
Integrated Logistics Support																												
Develop Transportation Products and Processes					[redacted]																							

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604776F / *Deployment & Distribution Enterprise R&D*	**Project (Number/Name)** 640215 / *Transportation Management Service*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Integrated Logistics Support				
Develop Transportation Products and Processes	1	2022	4	2023

Note

DoD enterprise end-to-end transportation and transportation-related financial business process reform.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0604858F / *Tech Transition Program*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	297.254	359.045	649.545	0.000	649.545	314.135	212.222	144.985	153.594	Continuing	Continuing
640858: *AFWERX Prime*	-	0.000	111.467	130.860	0.000	130.860	88.221	88.257	20.775	0.000	Continuing	Continuing
645350: *Experimentation*	-	117.261	91.383	254.594	0.000	254.594	135.619	45.055	46.308	47.338	Continuing	Continuing
645351: *Prototyping*	-	179.993	156.195	264.091	0.000	264.091	90.295	78.910	77.902	106.256	Continuing	Continuing

A. Mission Description and Budget Item Justification

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

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

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

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

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

This program element may include necessary civilian pay expenses required to manage, execute, and deliver weapon system capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program element 0605827F, 0605828F, 0605829F, 0605831F, 0605832F, 0605833F, 0605898F, 0606398F, 0605831F, and/or 0606017F. In FY 2022, $2.984 million was expended for civilian pay expenses in this program element, and in FY 2023, $3.136 million is forecasted for civilian pay expenses in this program element.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*

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

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

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

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*

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

Change Summary Explanation

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

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

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
640858: *AFWERX Prime*	-	0.000	111.467	130.860	0.000	130.860	88.221	88.257	20.775	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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

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

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

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

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

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

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

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

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

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

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

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

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AOI 1 Performer A	Reqn	Various : Various	-	-		12.000	Oct 2021	11.127	Oct 2022	-		11.127	Continuing	Continuing	-
AOI 2 Performer A	Reqn	Various : Various	-	-		3.000	Nov 2021	3.128	Nov 2022	-		3.128	Continuing	Continuing	-
AOI 1 Performer B	Reqn	Various : Various	-	-		6.000	Jan 2022	14.127	Jan 2023	-		14.127	Continuing	Continuing	-
AOI 2 Performer B	Reqn	Various : Various	-	-		4.000	Feb 2022	3.223	Feb 2023	-		3.223	Continuing	Continuing	-
AOI 3 Performer A	Reqn	Various : Various	-	-		3.000	Dec 2021	7.127	Dec 2022	-		7.127	Continuing	Continuing	-
AOI 3 Performer B	Reqn	Various : Various	-	-		4.000	Mar 2022	9.133	Mar 2023	-		9.133	Continuing	Continuing	-
Air Race Partners	RO	Various : Various	-	-		5.000	Jun 2022	5.255	Jun 2023	-		5.255	Continuing	Continuing	-
Next Gen Large Aircraft	MIPR	DIU : Mountain View, CA	-	-		-		51.217	Dec 2022	-		51.217	Continuing	Continuing	-
Congressional Add- Agility Prime	Various	Various : Various	-	-		54.000	Sep 2022	-		-		-	Continuing	Continuing	-
		Subtotal	-	-		91.000		104.337		-		104.337	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Modeling and Analytics Support	MIPR	Various : Various	-	-		2.000	Nov 2021	1.537	Nov 2022	-		1.537	Continuing	Continuing	-
Government Test Support	WR	Various : Various	-	-		2.000	Dec 2021	2.225	Dec 2022	-		2.225	Continuing	Continuing	-
Airworthiness and Test Support	Various	Various : Various	-	-		3.000	Nov 2021	1.137	Nov 2022	-		1.137	Continuing	Continuing	-
Next Generation Large Aircraft Test Support	MIPR	Various : Various	-	-		-		2.000	Nov 2022	-		2.000	Continuing	Continuing	-
		Subtotal	-	-		7.000		6.899		-		6.899	Continuing	Continuing	N/A

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

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Autonomy And Hybrid Stratfi	MIPR	Various : Various	-	-		5.000	Dec 2021	5.258	Dec 2022	-		5.258	Continuing	Continuing	-
Autonomy and Hybrid Stratfi (2)	MIPR	Various : Various	-	-		5.000	Feb 2022	5.258	Feb 2023	-		5.258	Continuing	Continuing	-
Next Gen Large Aircraft/ Test/Airworthiness	MIPR	Various : Various	-	-		-		1.863	Jan 2023	-		1.863	Continuing	Continuing	-
		Subtotal	-	-		10.000		12.379		-		12.379	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AFWERX Prime Management PMA	Various	Various : Various	-	-		3.467	Dec 2021	5.416	Oct 2022	-		5.416	Continuing	Continuing	-
Next Generation Large Aircraft PMA	Various	Various : Various	-	-		-		1.829	Oct 2022	-		1.829	Continuing	Continuing	-
		Subtotal	-	-		3.467		7.245		-		7.245	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		111.467		130.860		-		130.860	Continuing	Continuing	N/A

Remarks

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

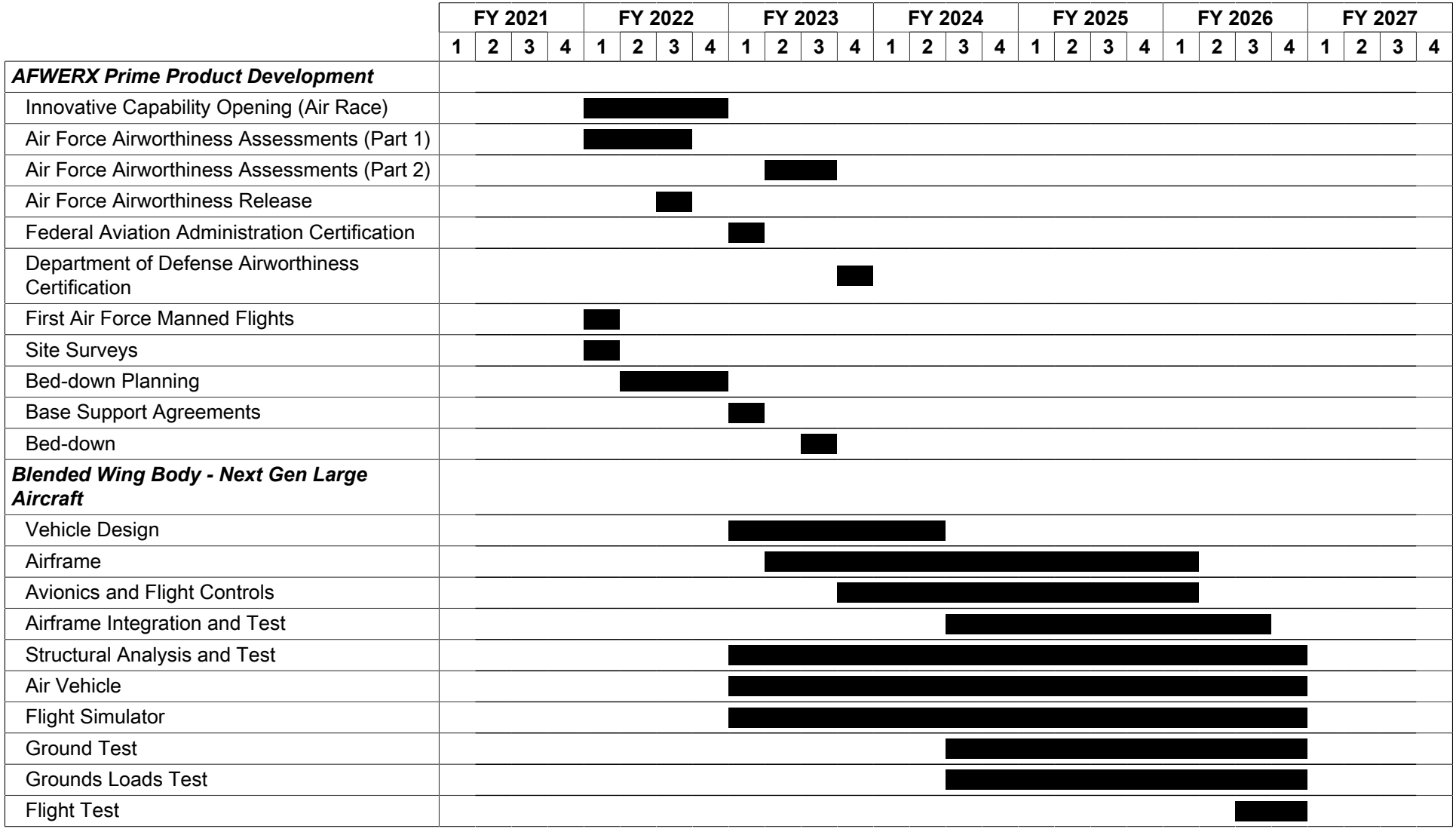

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 640858 / *AFWERX Prime*

Schedule Details

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

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
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COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
645350: *Experimentation*	-	117.261	91.383	254.594	0.000	254.594	135.619	45.055	46.308	47.338	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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

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

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

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

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
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Experimentation is focused on rapid learning and then pivoting existing or future capability development efforts based on that knowledge to ensure the most pressing operational gaps are addressed and our warfighting advantages are preserved. Further details can be provided in the appropriate forum.

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

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

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

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

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
- Following the live fire joint service, Operational Experimentation test event with an international partner, the Base Defense Experimentation efforts will assess the maintainability, reliability, and suitability of the National Advanced Surface to Air Missile System (NASAMS) in OCONUS operations as part of Joint Service operations in partnership with EUCOM. - As part of the ADAIR-UX Experimentation effort, the Strategic Development Planning and Experimentation office will partner with Major Commands and Program Executive Offices to build and execute operational experimentation efforts focused on the implementation of Autonomous Air Platforms in key operational tests, operational training exercises, and joint-service campaigns. These efforts will focus on operational experimentation and prototyping of an unmanned adversary air platform for use in pilot training. This will transition advancements pioneered through the Skyborg effort and industry advancements to produce initial fielded capability. The autonomous vehicle produced through these efforts will employ an open architecture approach providing an avenue for rapid adoption of future technology advancements. - The Department of Defense is actively pushing the development and fielding of numerous Artificial Intelligence systems that are required to be "safe, secure, and robust". The Strategic Development Planning and Experimentation office will also lead the Counter-Artificial Intelligence Experimentation efforts that will collaborate with industry Artificial Intelligence/Machine Learning leaders and service labs to assess vulnerabilities of codes that are being developed, tested, and implemented in air platforms. Leveraging the findings from the Intelligence Community, efforts will not only identify susceptibilities in Department of the Air Force systems, but also seek opportunities to counter and exploit adversary Artificial Intelligence platforms. The Air Force has long maintained a tactical advantage against any and all adversaries in the utilization and employment of the E-3 Airborne Warning & Control System (AWACS) to identify, track, and target enemy airborne platforms. Experimentation efforts will focus on determining how the Air Force can maintain this competitive advantage by assessing Artificial Intelligence/Machine Learning algorithms employed on several different autonomous air platforms in tactical operations and joint exercises. Experimentation efforts will continue to identify and evaluate potential game-changing Agile Combat Employment operations that enable Air Force expeditionary operations in austere, difficult to locate positions. - Smaller experimentation campaigns will be undertaken to address the strategic dilemma posed at Air University's Chief of Staff of the Air Force sponsored Blue Horizons program. Only those Experimentation efforts that are deemed the absolute highest priority by the Department of the Air Force Leadership will be executed aiming to create technologies and processes that will provide the largest competitive advantages and produce the most significant dilemmas for our adversaries will be investigated or executed. Data from all efforts is provided directly to AF Plans and Programs (A8), Futures (5/7), Secretary of the Air Force for Acquisition, Technology and Logistics (AQ), and US Space Force Futures and Integration (S8), and the Space Warfighting Analysis Center (SWAC) to drive capability development			
FY 2022 to FY 2023 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY 2023 funding increased compared to FY 2022 by $109.211 million. Funding increased due to addition of efforts to perform experimentation on unmanned adversary air platform for use in pilot training and also due to focus on operational utilities of technologies and techniques to disrupt adversarial threats.			
Title: Rapid Defense Experimentation Reserve	0.000	0.000	64.000
Description: The Department of Defense implement multiple RDER experimentation series through Service nominated projects with execution timelines ranging from one to two years. The USD (R&E) will review project progress, and recommend new projects at least annually with the goal of quickly incorporating the most promising innovative prototypes into experiments, and promptly terminating projects that fail to achieve expectations. To incentivize a disciplined approach to rapidly identify, incorporate, and execute projects largely through the Military Services, the Department will fund approved Service projects for the upcoming fiscal year out of the Department reserves. Funding decisions on additional funds in follow-on years for new projects, and funding decrements for project terminations will be incorporated in budgets annually based on emerging requirements and periodic assessments of project viability. Services will execute these funds under oversight of the OSD in a manner consistent with the experimentation scenario for which individual projects were selected. Service experimentation outcomes will be designed to validate required capabilities enabling the JWC by evaluating and integrating prototyped technologies in operationally relevant, multi-domain environments. Experimentation results will facilitate Joint Staff analysis in the evaluation of the Joint Warfighting Concept, assist the Joint Requirements Oversight Counsel in requirements determination, and inform the Deputy's Management Action Group to make budget decisions that effect changes throughout the Department. ***FY 2022 Plans:*** Not Applicable ***FY 2023 Plans:*** RDER efforts include the following efforts: CONCEAD, TURUL, Global Thunder, and RDER Classified Effort # 2 (further details available on the appropriate forum). - CONCEAD: will develop and flight demonstrate precision RF synchronization open-architecture prototypes for enhanced sensing and disruptive electromagnetic spectrum (EMS) capability. CONCEAD expands on methods developed under the Retroactive Arrays for Coherent Transmission (ReACT) program (previously budgeted in PE 0603766E Network Centric Warfare Technology) to advance EMS dominance. Specific plans for FY 2023 include developing advanced hardware and waveforms to raise the technology readiness level (TRL) of this disruptive EMS capability. Design and purchase advanced hardware system; Mature methods for acquiring threat radar waveforms; Mature and analyze enhanced waveforms. - Turul: will deliver a minimum viable product software that will enable the warfighter to make requests and receive information from a variety of commercial space providers. These data products will be utilized to automatically generate information products			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
that the warfighter can leverage in their find, fix, track, target, engage, and assess (F2T2EA) workflows. In FY 2023 TURUL will deliver graphical User Interface accessible unclassified via the cloud that the warfighter can utilize to task, collect, and view data products from commercial space sensors. - Global Thunder: will prototype, integrate and perform operational experimentation on advanced satellite communications terminals for selected aircraft. The terminals will follow the Global Lightning design architecture with the capability to dynamically switch between communications spacecraft in low-Earth orbit (LEO, 500-km), medium-Earth orbit (MEO, 8,000 km), and geosynchronous orbit (GEO, 36,000 km), utilizing a multi-modem design that allows connectivity to both commercial and protected government satellites. Global Thunder FY 2023 efforts include receiver terminal prototyping and initial aircraft integration. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 funding increased compared to FY 2022 by $64.000 million. Funding increased due to the addition of OSD directed efforts to facilitate rapid modernization through Rapid Defense Experimentation.			
Accomplishments/Planned Programs Subtotals	61.699	81.383	254.594

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

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

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

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

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Experimentation Campaigns	C/Various	Various : Various	-	0.000	Sep 2021	5.205	Sep 2022	4.733	Mar 2023	-		4.733	Continuing	Continuing	-
Experimentation Campaign Hawkeye Contract 1	C/CPAF	L3 Harris : Salt Lake City, UT	-	1.500	Apr 2021	-		-		-		-	Continuing	Continuing	-
Experimentation Campaign Hawkeye Contract 2	C/CPFF	Lockheed : Fort Worth, TX	-	0.700	Mar 2021	-		-		-		-	Continuing	Continuing	-
Experimentation Campaign Hawkeye Contract 3	C/CPFF	Space X : Hawthorne, CA	-	4.763	Dec 2021	3.903	Aug 2022	-		-		-	Continuing	Continuing	-
Experimentation Campaign Hawkeye Contract 4	Various	Various : Various	-	-		5.666	Sep 2022	10.000	Dec 2022	-		10.000	Continuing	Continuing	-
Experimentation Campaigns Hawkeye Contract 5	Various	Various : Various	-	-		-		18.000	Nov 2022	-		18.000	Continuing	Continuing	-
Experimentation Campaign Hawkeye Contract 6	Various	Various : Various	-	-		-		2.000	Dec 2022	-		2.000	Continuing	Continuing	-
Rapid Defense Experimentation Reserve (RDER) CONCEAD	Various	Various : Various	-	-		-		18.000	Mar 2023	-		18.000	Continuing	Continuing	-
Rapid Defense Experimentation Reserve (RDER) Global Thunder	Various	Various : Various	-	-		-		20.000	Dec 2022	-		20.000	Continuing	Continuing	-
Rapid Defense Experimentation Reserve (RDER) Classified	Various	Various : Various	-	-		-		15.000	Nov 2022	-		15.000	Continuing	Continuing	-
Rapid Defense Experimentation Reserve (RDER) TURUL	Various	Various : Various	-	-		-		11.000	Jan 2023	-		11.000	Continuing	Continuing	-
Experimentation Campaign Autonomous Attritable Aircraft	Various	Various : Various	-	1.387	Aug 2021	0.236	Aug 2022	-		-		-	Continuing	Continuing	-
Experimentation Campaign Hawkeye Contract 4	C/CPFF	Raytheon : McKinney,, TX	-	5.401	Dec 2021	-		-		-		-	Continuing	Continuing	-
Experimentation Campaign Hawkeye Contract 5	Various	Various : Various	-	0.500	Oct 2021	-		-		-		-	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
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Product Development ($ in Millions)

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

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Experimentation Campaign PNT	Various	Various : Various	-	0.861	Sep 2021	0.000	Sep 2022	-		-		-	Continuing	Continuing	-
Experimentation Campaign AERRES	Various	Various : Various	-	3.954	Mar 2021	10.917	Sep 2022	6.500	Dec 2022	-		6.500	Continuing	Continuing	-
Experimentation Campaign AMTI	Various	Various : Various	-	-		1.800	Sep 2022	5.000	Feb 2023	-		5.000	Continuing	Continuing	-
Experimentation Campaign Agile Combat Employment	Various	Various : Various	-	-		-		5.000	Dec 2022	-		5.000	Continuing	Continuing	-
Congressional Add - Low Cost Attritable Aircraft Technology	C/Various	Various : Various	-	48.316	Mar 2022	-		-		-		-	0.000	48.316	-
Congressional Add - Autonomous Air Combat Operations	Various	Various : Various	-	4.831	Jun 2021	10.000	Sep 2022	-		-		-	0.000	14.831	-
Experimentation Campaign Unmanned Adversary Air (ADAIR UX)	Various	Various : Various	-	-		-		67.607	Jul 2023	-		67.607	Continuing	Continuing	-
		Subtotal	-	89.468		73.766		216.090		-		216.090	Continuing	Continuing	N/A

Remarks

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

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Experimentation Campaign Support	Various	Various : Various	-	2.435	Mar 2021	0.225	Mar 2022	4.128	Mar 2023	-		4.128	Continuing	Continuing	-
Experimentation Campaign Autonomous Attritable Aircraft Support 1	MIPR	Perduco/GSA : O'Fallon, IL	-	1.401	Aug 2021	2.000	Nov 2021	5.200	Nov 2022	-		5.200	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604858F / *Tech Transition Program*	Project (Number/Name) 645350 / *Experimentation*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Experimentation Campaign Autonomous Attritable Aircraft Support 2	MIPR	OO-ALC : Ogden, UT	-	0.591	Jul 2021	0.700	Sep 2022	-		-		-	Continuing	Continuing	-
Experimentation Campaign Airpiercer	MIPR	WHS : Alexandria, VA	-	0.300	Aug 2021	-		-		-		-	Continuing	Continuing	-
Experimentation Campaign Hawkeye	Various	Various : Various	-	0.224	Dec 2021	0.717	Dec 2022	-		-		-	Continuing	Continuing	-
Experimentation Campaign Base Defense	MIPR	Various : Various	-	4.040	Dec 2021	2.845	Sep 2022	4.000	Nov 2022	-		4.000	Continuing	Continuing	-
Experimentation Campaign Blue Horizons	MIPR	DOE : Oak Ridge, TN	-	0.176	Aug 2021	-		0.250	Nov 2022	-		0.250	Continuing	Continuing	-
Experimentation Campaign AERRES 1	MIPR	AAFC/AFR : Adelphi, MD	-	0.300	Mar 2022	-		0.500	Oct 2022	-		0.500	Continuing	Continuing	-
Experimentation Campaign AERRES 2	MIPR	SWRI : TBD	-	-		0.300		-		-		-	Continuing	Continuing	-
Experimentation Campaign Floatplane	MIPR	Various : Various	-	3.506	Sep 2021	-		-		-		-	Continuing	Continuing	-
Experimentation Campaign PNT	MIPR	DTIC : Ft Belvoir, VA	-	0.860	Sep 2021	-		-		-		-	Continuing	Continuing	-
Experimentation Campaign AMTI	Various	Various : Various	-	-		0.000	Sep 2022	1.000	Oct 2022	-		1.000	Continuing	Continuing	-
		Subtotal	-	13.833		6.787		15.078		-		15.078	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Experimentation Campaign Test and Evaluation	MIPR	Various : Various	-	2.457	Oct 2021	0.000	Dec 2021	2.980	Dec 2022	-		2.980	Continuing	Continuing	-
Experimentation Campaign Hawkeye	Various	Various : Various	-	1.562	Oct 2021	3.014	Jun 2022	-		-		-	0.000	4.576	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604858F / *Tech Transition Program*	Project (Number/Name) 645350 / *Experimentation*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Experimentation Campaign Autonomous Attritable Aircraft T&E 1	MIPR	Various : Various	-	1.778	Sep 2021	0.775	Apr 2022	6.100	Apr 2023	-		6.100	Continuing	Continuing	-
Experimentation Campaign Autonomous Attritable Aircraft T&E 2	MIPR	Army : Redstone Arsenal, AL	-	1.084	Sep 2021	-		-		-		-	Continuing	Continuing	-
Experimentation Campaign AERRES 1	MIPR	96 OSS : Eglin AFB, FL	-	1.216	Aug 2021	0.000	Dec 2021	3.770	Dec 2022	-		3.770	Continuing	Continuing	-
Experimentation Campaign AERRES 2	MIPR	586th : CA	-	-		1.320		-		-		-	Continuing	Continuing	-
Experimentation Campaign Base Defense	MIPR	Various : Various	-	0.334	Aug 2021	0.000	Dec 2021	4.000	Oct 2022	-		4.000	Continuing	Continuing	-
Blue Horizons	Various	Various : Various	-	-		-		1.000	Nov 2022	-		1.000	Continuing	Continuing	-
Experimentation Campaign Counter AI	Various	Various : Various	-	0.300	Mar 2022	0.000	Jun 2022	-		-		-	Continuing	Continuing	-
Experimentation Campaign PNT	Various	Various : Various	-	0.115	Sep 2021	-		-		-		-	Continuing	Continuing	-
Experimentation Campaign RPT	MIPR	96th TW : Eglin AFB, FL	-	0.300	May 2021	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	9.146		5.109		17.850		-		17.850	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Experimentation Campaign Contractor Support	Various	Various : Various	-	0.083	Mar 2021	0.233	Dec 2021	0.266	Oct 2022	-		0.266	Continuing	Continuing	-
Experimentation Campaign Program Management Administration Costs	Various	Various : Various	-	4.731	Mar 2022	5.488	Jan 2022	5.310	Nov 2022	-		5.310	Continuing	Continuing	-
		Subtotal	-	4.814		5.721		5.576		-		5.576	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604858F / *Tech Transition Program*	Project (Number/Name) 645350 / *Experimentation*	

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	117.261		91.383		254.594		-		254.594	Continuing	Continuing	N/A

Remarks

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

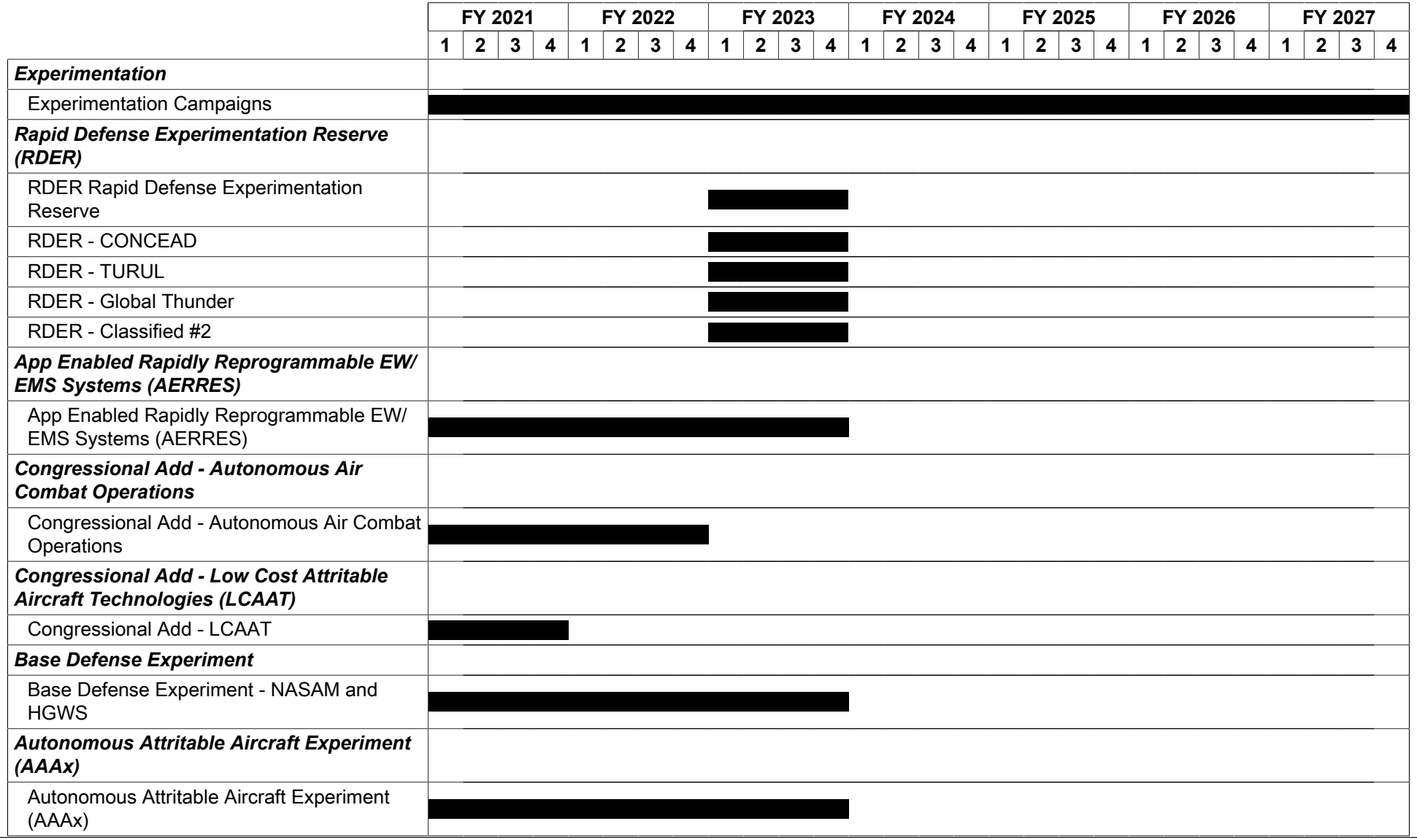

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 645350 / *Experimentation*

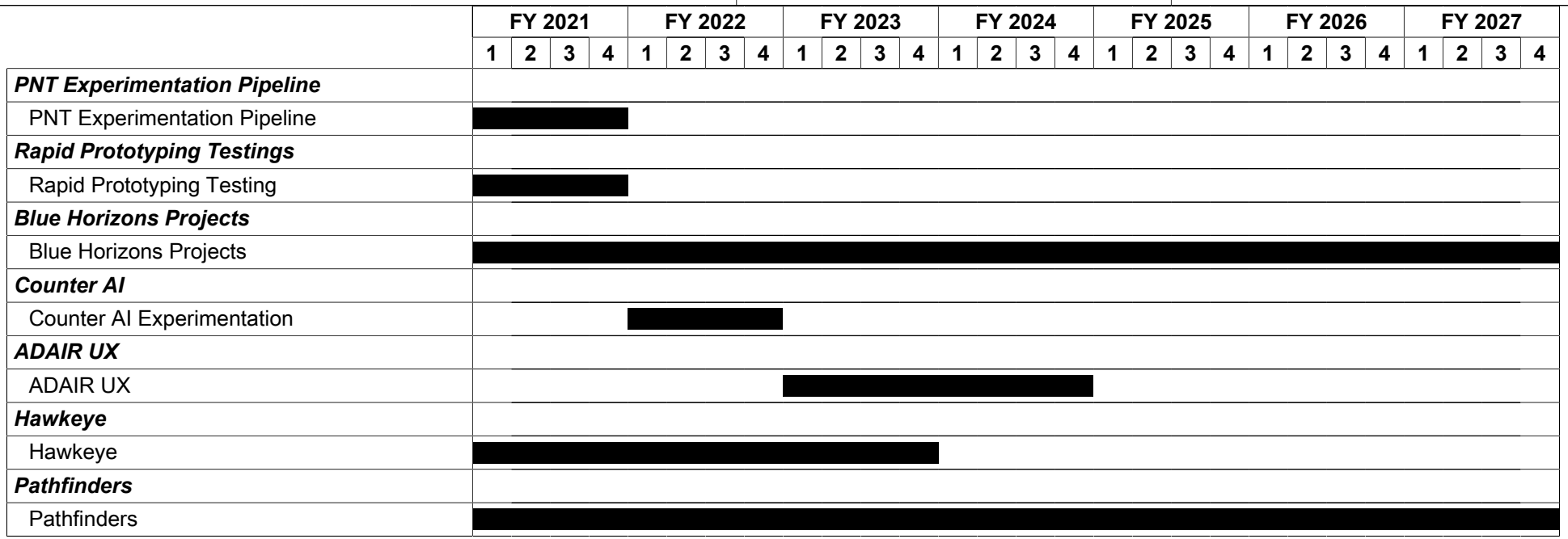

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 645350 / *Experimentation*

Schedule Details

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

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

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Blue Horizons Projects	1	2021	4	2027
Counter AI				
Counter AI Experimentation	1	2022	4	2022
ADAIR UX				
ADAIR UX	1	2023	4	2024
Hawkeye				
Hawkeye	1	2021	4	2023
Pathfinders				
Pathfinders	1	2021	4	2027

Note

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

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

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
645351: *Prototyping*	-	179.993	156.195	264.091	0.000	264.091	90.295	78.910	77.902	106.256	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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

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

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

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

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

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

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

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

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

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

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023

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

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

FY 2022 Plans:
Not Applicable

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

FY 2022 to FY 2023 Increase/Decrease Statement:

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

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

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

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
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	FY 2021	FY 2022
FY 2021 Accomplishments: Conduct Congressionally-directed efforts ***FY 2022 Plans:*** Not Applicable		
Congressional Add: Program Increase - Massive Area Additive Manufacturing ***FY 2021 Accomplishments:*** Conduct Congressionally-directed efforts ***FY 2022 Plans:*** Not Applicable	9.663	0.000
Congressional Add: Program Increase - Additive Manufacturing for Metals ***FY 2021 Accomplishments:*** Conduct Congressionally-directed efforts ***FY 2022 Plans:*** Not Applicable	9.663	0.000
Congressional Add: Program Increase - Artic Communications ***FY 2021 Accomplishments:*** Conduct Congressionally - directed efforts ***FY 2022 Plans:*** Not Applicable	48.316	0.000
Congressional Add: Program Increase - Heavy Payload Solar Powered UAS JCTD ***FY 2021 Accomplishments:*** Conduct Congressionally-directed efforts ***FY 2022 Plans:*** Not Applicable	14.494	0.000
Congressional Add: Program increase - logistics enhancements ***FY 2021 Accomplishments:*** Not Applicable ***FY 2022 Plans:*** Conduct Congressionally-directed efforts	0.000	4.000
Congressional Add: Program increase - alternative PNT phase III demonstration ***FY 2021 Accomplishments:*** Not Applicable ***FY 2022 Plans:*** Conduct Congressionally-directed efforts	0.000	4.000
Congressional Adds Subtotals	96.388	8.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

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

D. Acquisition Strategy

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

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

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

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prototyping	Various	Various : Various	-	-		2.404	Dec 2022	-		-		-	Continuing	Continuing	-
Prototyping Campaign Global Lightning Commercial Space Internet Contract 1	C/CPFF	Raytheon : McKinney, TX	-	5.500	Sep 2021	3.688	Feb 2022	-		-		-	Continuing	Continuing	-
Prototyping Campaign Global Lightning Commercial Space Internet Contract 2	C/CPFF	Various : Various	-	0.000	Mar 2021	-		-		-		-	Continuing	Continuing	-
Prototyping Campaign Global Lightning Commercial Space Internet Contract 3	C/CPFF	SpaceX : Hawthorne, CA	-	11.242	Oct 2021	7.936	Apr 2022	-		-		-	Continuing	Continuing	-
Prototyping Campaign Global Lightning Commercial Space Internet Contract 4	C/CPFF	Northrop Grumman : San Diego, CA	-	1.700	Jul 2021	7.822	May 2022	-		-		-	Continuing	Continuing	-
Prototyping Campaign Global Lightning Commercial Space Internet Contract 5	C/CPFF	L3 : Salt Lake City, UT	-	1.800	Jun 2021	2.015	Apr 2022	-		-		-	0.000	3.815	-
Prototyping Campaign Global Lightning Commercial Space Internet Contract 6	C/CPFF	Ball Aerospace : Boulder, CO	-	4.995	Mar 2021	-		-		-		-	Continuing	Continuing	-
Prototyping Campaign Global Lightning Commercial Space Internet Contract 7	C/CPFF	Hughes : Germantown, MD	-	2.426	May 2021	-		-		-		-	Continuing	Continuing	-
Prototyping Campaign Global Lightning Commercial Space Internet Contract 8	C/CPFF	Lockheed Martin : Fort Worth, TX	-	2.450	Mar 2021	8.369	Apr 2022	-		-		-	Continuing	Continuing	-
NC3 Commercial Development/Prototyping Terminal Contract	C/CPFF	Various : Various	-	-		-		70.000	Oct 2022	-		70.000	Continuing	Continuing	-

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

Product Development ($ in Millions)

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

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

Product Development ($ in Millions)

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

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

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Congressional Add Logistics Enhancements	Various	Various : Various	-	-		4.000	Sep 2022	-		-		-	Continuing	Continuing	-
		Subtotal	-	158.445		113.561		213.000		-		213.000	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prototyping Support	Various	Various : Various	-	-		5.549	Jul 2022	2.000	Nov 2022	-		2.000	Continuing	Continuing	-
Prototyping Campaign Global Lightning Commercial Space Internet Support 1	MIPR	BAH : Tysons Corner, VA	-	-		2.129	Feb 2022	-		-		-	0.000	2.129	-
Prototyping Campaign Global Lightning Commercial Space Internet Support 2	MIPR	DTIC : Ft Belvoir, VA	-	1.313	Jul 2021	-		-		-		-	Continuing	Continuing	-
Prototyping Campaign Global Lightning Commercial Space Internet Support 3	MIPR	Various : Various	-	-		1.000	Oct 2021	-		-		-	Continuing	Continuing	-
Prototyping Campaign FloatPlane MC130J Amphibious Capability Support 1	MIPR	Various : Various	-	1.625	Aug 2021	-		-		-		-	Continuing	Continuing	-
NC3 Commercial Development/Prototyping Mission Analysis Support 1	MIPR	RAND Corp : Santa Monica, CA	-	-		-		2.000	Nov 2022	-		2.000	Continuing	Continuing	-
NC3 Commercial Development/Prototyping Mission Analysis Support 2	MIPR	TBD : TBD	-	-		-		2.000	Dec 2022	-		2.000	Continuing	Continuing	-
Prototyping Campaign Base Defense Support 1	MIPR	JHU : Baltimore, MD	-	-		0.854	Jun 2022	-		-		-	Continuing	Continuing	-

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

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prototyping Campaign Base Defense Support 2	MIPR	Army : Picatinny Arsenal, NJ	-	4.574	Jul 2021	-		-		-		-	Continuing	Continuing	-
Prototyping Campaign Base Defense Support 3	MIPR	Navy : Dahlgren, VA	-	3.744	Sep 2021	2.218	Mar 2022	-		-		-	Continuing	Continuing	-
Prototyping Campaign Hawkeye	MIPR	Eglin AFB : Destin, FL	-	-		0.530	Jul 2022	-		-		-	Continuing	Continuing	-
Prototyping Campaign Palletized Munitions (Rapid Dragon)	MIPR	Dahlgren Navy : Dahglren, VA	-	1.772	Sep 2021	1.750	Nov 2021	2.000	Nov 2022	-		2.000	Continuing	Continuing	-
Prototyping Campaign Palletized Munitions (Rapid Dragon) 2	MIPR	412 TW : Edwards AFB, CA	-	-		1.350		-		-		-	Continuing	Continuing	-
Prototyping Campaign Palletized Munitions Support	Various	Various : Various	-	-		6.639		-		-		-	Continuing	Continuing	-
Prototyping Campaign Autonomous Attritable Aircraft	Various	Various : Various	-	0.083	Nov 2021	1.925	Feb 2022	-		-		-	Continuing	Continuing	-
Prototyping Campaign Podded Position Navigation and Timing Prototyping	Various	Various : Various	-	-		0.466	Mar 2022	-		-		-	Continuing	Continuing	-
Regional Operating Picture	C/FFP	Persistent Systems, LLC : New York, NY	-	-		2.000	Apr 2022	5.500	Feb 2023	-		5.500	Continuing	Continuing	-
		Subtotal	-	13.111		26.410		13.500		-		13.500	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prototyping Test and Evaluation	Various	Various : Various	-	-		-		-		-		-	Continuing	Continuing	-
Prototyping Campaign Global Lightning	MIPR	Various : Various	-	0.805	Aug 2021	1.200	May 2022	-		-		-	0.000	2.005	-

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

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Commercial Space Internet															
Prototyping Campaign Palletized Munitions (Rapid Dragon)	MIPR	Various : Various	-	1.705	Nov 2021	3.300	May 2022	16.050	Jan 2023	-		16.050	Continuing	Continuing	-
Prototyping Campaign Navigation Technology Satellite 3	MIPR	Various : Various	-	1.300	Apr 2021	0.900	Feb 2022	-		-		-	Continuing	Continuing	-
Prototyping Campaign Base Defense	MIPR	Various : Various	-	-		2.610	Apr 2022	-		-		-	Continuing	Continuing	-
Prototyping Campaign Autonomous Attritable Aircraft	Various	Various : Various	-	2.040	Sep 2021	2.475	Apr 2022	-		-		-	Continuing	Continuing	-
Prototyping Campaign FloatPlane MC130J Amphibious Capability	MIPR	WHS : Washington, DC	-	1.075	May 2021	-		-		-		-	Continuing	Continuing	-
Prototyping Campaign Hawkeye	MIPR	Various : Various	-	-		0.570	Jun 2022	-		-		-	Continuing	Continuing	-
Regional Operating Picture	C/FFP	Persistent Systems LLC : New York, NY	-	-		1.500	May 2022	18.000	Jan 2023	-		18.000	Continuing	Continuing	-
Prototyping Campaign Podded Position Navigation and Timing Prototyping	Various	Various : Various	-	-		0.534	Mar 2022	-		-		-	Continuing	Continuing	-
		Subtotal	-	6.925		13.089		34.050		-		34.050	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prototyping Contractor Support	Various	Various : Various	-	0.070	Feb 2021	0.246	Mar 2022	0.133	Nov 2022	-		0.133	Continuing	Continuing	-

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

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prototyping Program Management Administration Costs	Various	Various : Various	-	1.442	Feb 2021	2.889	Feb 2022	3.408	Jan 2023	-		3.408	Continuing	Continuing	-
		Subtotal	-	1.512		3.135		3.541		-		3.541	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	179.993		156.195		264.091		-		264.091	Continuing	Continuing	N/A

Remarks

Additional details can be provided in the appropriate forum.

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

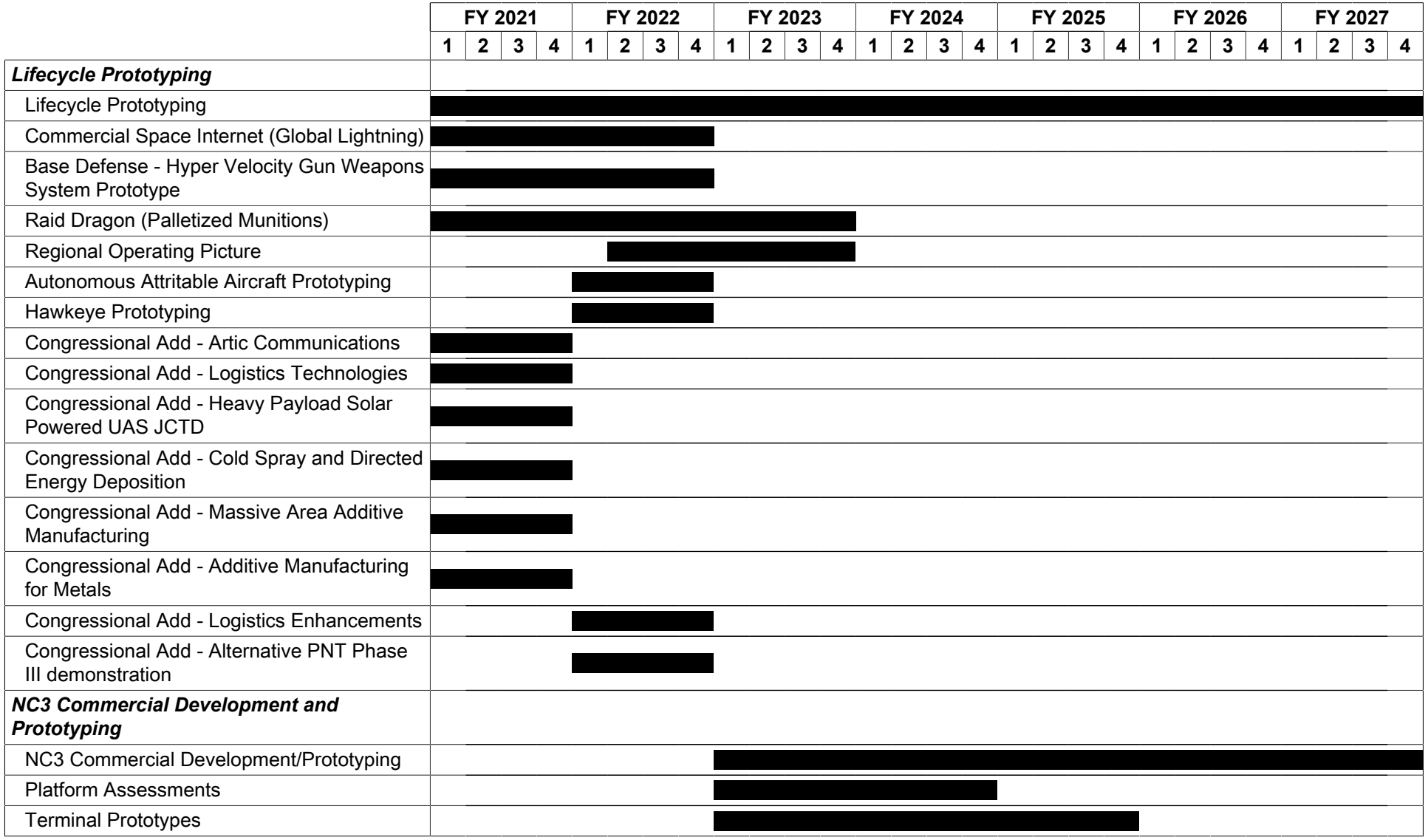

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 645351 / *Prototyping*

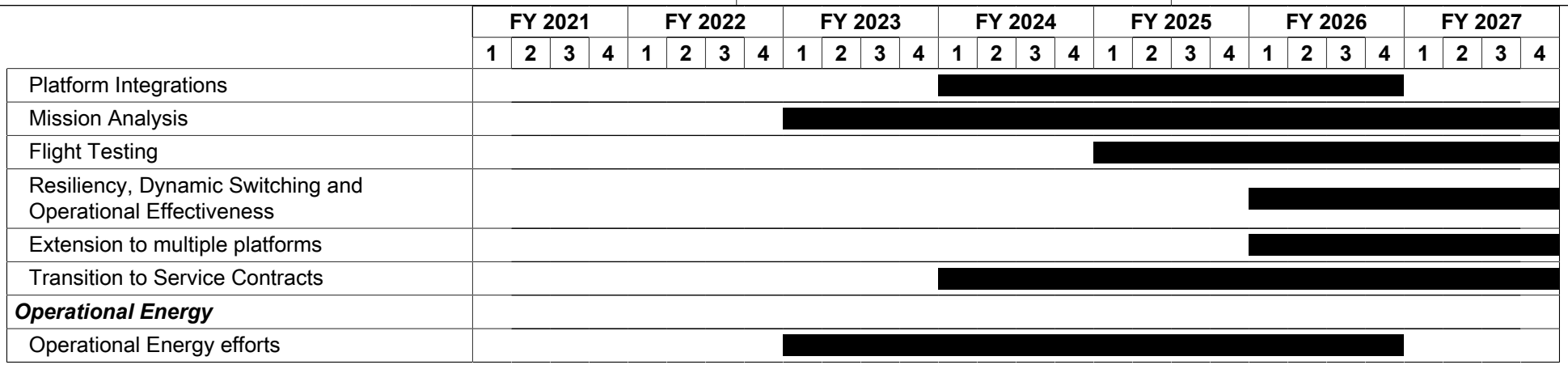

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 645351 / *Prototyping*

Schedule Details

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

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

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

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0604860F / *Operational Energy and Installation Resilience*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	0.000	104.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
644860: *Operational Energy and Installation Resilience*	-	0.000	104.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Although FY 2022 funding for the Operational Energy program is within this program element per congressional direction, due to the timing of the FY 2023 President's Budget submission and the signing of the FY 2022 Appropriations bill, Operational Energy funding for FY 2023 and beyond is currently documented in the Tech Transition Program (0604858F).

A. Mission Description and Budget Item Justification

The Operational Energy and Installation Resilience program develops, matures, prototypes, and demonstrates technologies and processes focused in two areas: decreasing operational energy risk and increasing installation resilience. The Air Force is DOD's largest consumer of operational energy, and also requires resilient installations to execute its missions. Technology transition and process integration efforts with a focus in these areas enable the Air Force to optimize operational energy use for maximum combat capability, and mitigate multi-domain energy threats to installations. The objective of this program is to prioritize, validate, and implement solutions to that end.

In similar manner to the Tech Transition Program (0604858F), the Operational Energy and Installation Resilience program allows acquisition program managers and warfighters to prototype, demonstrate, and transition candidate technologies and processes, including assessments in operationally relevant environments.

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 FY2021 $0 was expended for civilian pay expenses in this program element, In FY 2022, no more than 3% of the total program element funds will be used for this purpose.

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604860F / *Operational Energy and Installation Resilience*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	104.000	0.000	0.000	0.000
Total Adjustments	0.000	104.000	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	70.000			
• Congressional Directed Transfers	0.000	34.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Project: 644860: *Operational Energy and Installation Resilience*		
Congressional Add: *Program Increase - Energy and Climate Resilience*	0.000	70.000
Congressional Add Subtotals for Project: 644860	0.000	70.000
Congressional Add Totals for all Projects	0.000	70.000

Change Summary Explanation

In addition to the 70M congressional add, the FY22 appropriations bill also directed transfer of 34M for Operational Energy efforts from the Tech Transition Program (0604858F) to this new program element. In addition, although FY 2022 funding for the Operational Energy program is within this program element per congressional direction, due to the timing of the FY 2023 President's Budget submission and the signing of the FY 2022 Appropriations bill, Operational Energy funding for FY 2023 and beyond is currently documented in the Tech Transition Program (0604858F).

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Operational Energy	-	34.000	0.000	0.000	0.000
Description: Operational energy efforts seek to decrease overall mission energy intensity (i.e. energy demand reduction). Efforts in this program can include prototyping and demonstration of technologies and processes that maximize combat capability by optimizing the following areas: platform energy use, mission planning and execution, propulsion sustainment, and energy logistics. Energy education, energy-informed wargaming, digital engineering, and modeling and simulation efforts typically support these efforts. Specific examples of prototype					

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604860F / *Operational Energy and Installation Resilience*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total

and demonstration projects that optimize energy use and decrease energy intensity include: legacy aircraft drag reduction technologies, alternate-fuel propulsion systems, ultra-efficient airframe designs, air-asset allocation tools, cargo load planning tools, and turbine engine sustainment enhancements for increased fuel efficiency.

While similar efforts may be found in other program elements, Operational Energy projects in these technology and process areas are viewed through an "energy lens," specifically geared toward cost-effectively optimizing energy use to maximize combat capability. Ideally, as the Air Force progresses toward an energy-aware culture, all acquisition efforts will incorporate this tenet from the beginning of, and throughout, the acquisition life cycle. This program aims to advance such a culture through successful project execution.

FY 2022 Plans:

Continue legacy aircraft drag reduction efforts for cargo and tanker aircraft. Projects include C-17 aft body drag reduction, C-130 aft body drag reduction, and KC-135 drag reduction and will involve prototyping, demonstration, and fuel savings validation. Also continue development and implementation of mission planning and execution software tools and processes. Projects include cargo optimization (e.g. improved load planning), mobility asset allocation optimization, and mission scheduling optimization.

FY 2023 Base Plans:

(Also listed under the Tech Transition Program (0604858F) where FY 2023 funds are currently located): Operational energy software development, test, and deployment includes feature improvement operational tools, enabling of data analytics for decision advantage, and prototyping of new applications to improve mission effectiveness and energy intensity of operations. Operational energy efforts support technology development that aims to optimize Mobility Air Forces allocation and long range planning, unit readiness, and tactical and operational cargo planning processes. Operational energy efforts allow modeling and simulation to help DOD members understand the energy effects of decisions and the impacts on the total force, enabling better decision making and a more proactive energy posture. Operational Energy legacy aircraft drag reduction prototyping and demonstration efforts seek to improve the aerodynamic efficiency of legacy aircraft including the C-17, C-130, and KC-135.

FY 2023 OCO Plans:

N/A

FY 2022 to FY 2023 Increase/Decrease Statement:

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604860F / *Operational Energy and Installation Resilience*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
See note under overall program element cost table.					
Title: Installation Resilience	-	0.000	0.000	0.000	0.000
Description: Installation Resilience efforts seek to ensure Air Force installations provide the energy necessary to execute their mission. Insufficient installation energy at critical times most often results in mission failure. Given the oft-unique nature of each installation, these efforts typically require a complex balance of cost-effective yet assured installation energy. While energy cost and environmental factors are primary considerations, effectively mitigating the risk of disrupted energy supplies to Air Force installations is also a critical function. Installation Resilience prototype and demonstration projects seek to optimize the balance of cost-effectiveness and mission assurance, while considering environmental factors. Both technology and process innovations are leveraged to achieve these goals. Project examples include energy-as-a-service and charging-as-a-service business process demonstrations, microgrid technology prototypes and demonstrations, and geothermal technology demonstrations. ***FY 2022 Plans:*** FY 2022 efforts (via congressional add funding) are still in the planning stages and will be coordinated with congressional staff members shortly after submission of this budget document. ***FY 2023 Base Plans:*** To be determined. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A					
Accomplishments/Planned Programs Subtotals	-	34.000	0.000	0.000	0.000

	FY 2021	FY 2022
Congressional Add: Program Increase - Energy and Climate Resilience	0.000	70.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604860F / *Operational Energy and Installation Resilience*

	FY 2021	FY 2022
FY 2021 Accomplishments: n/a ***FY 2022 Plans:*** Conduct Congressionally Directed Efforts		
Congressional Adds Subtotals	0.000	70.000

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• RDTE 04 0604858F: *Tech Transition Program*	0.000	-	58.000	-	58.000	8.000	8.000	8.000	1.000	Continuing	Continuing

Remarks

Operational Energy and Installation Resilience efforts were previously funded under the Tech Transition Program (0604858F), primarily through congressional adds (e.g. Alternative Energy). A new program element dedicated to these areas was congressionally directed in the FY 2022 Appropriations Bill.

E. Acquisition Strategy

The efforts within this program element are variable and will employ multiple different acquisition strategies. In general, projects will seek to inform senior decision makers regarding the suitability of technology and process transition. As an example, for legacy aircraft drag reduction technologies, solutions will be prototyped and demonstrated via ground and/or flight assessments; drag reduction and fuel savings estimates will be validated or refined, suitability for fleet implementation will be assessed (maintainability, return-on-investment, etc.), and recommendations for transition will be made. Both FAR-based contracts and Other Transactions will be utilized.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604860F / *Operational Energy and Installation Resilience*	**Project (Number/Name)** 644860 / *Operational Energy and Installation Resilience*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
C-17 Aft Body Drag Reduction	TBD	Various : Various	-	-		2.900	Jul 2022	-		-		-	Continuing	Continuing	-
C-17 Drag Reduction - Other	TBD	Various : Various	-	-		1.400	Jul 2022	-		-		-	Continuing	Continuing	-
C-130 Aft Body Drag Reduction	TBD	Various : Various	-	-		2.900	Jul 2022	-		-		-	Continuing	Continuing	-
KC-135 Aft Body Drag Reduction	TBD	Various : Various	-	-		3.700	Jul 2022	-		-		-	Continuing	Continuing	-
KC-135 Vertical Windshield Wipers	TBD	Various : Various	-	-		1.800	Jun 2022	-		-		-	Continuing	Continuing	-
Mobility Aircraft Control Surface Analysis	TBD	Various : Various	-	-		1.800	Jul 2022	-		-		-	Continuing	Continuing	-
Cargo Optimization - Improved Load Planning	TBD	Various : Various	-	-		5.900	Jul 2022	-		-		-	Continuing	Continuing	-
Mobility Air Force Long Range Planning and Allocation Tools	Various	Various : Various	-	-		5.900	Jul 2022	-		-		-	Continuing	Continuing	-
Puckboard Scheduling Engine	TBD	Various : Various	-	-		5.900	Jul 2022	-		-		-	Continuing	Continuing	-
Program Increase - Energy & Climate Resilience	Various	Various : Various	-	-		67.000	Aug 2022	-		-		-	Continuing	Continuing	-
		Subtotal	-	-		99.200		-		-		-	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Operational Energy, Installation Resilience, and Climate Resilience Program Management Administration Costs	Various	Various : Various	-	-		1.800	Jun 2022	-		-		-	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604860F / *Operational Energy and Installation Resilience*	Project (Number/Name) 644860 / *Operational Energy and Installation Resilience*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Increase - Energy and Climate Resilience	C/CPAF	Not specified. : TBD	-	-		3.000	Aug 2022	-		-		-	Continuing	Continuing	-
		Subtotal	-	-		4.800		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		104.000		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604860F / *Operational Energy and Installation Resilience*	**Project (Number/Name)** 644860 / *Operational Energy and Installation Resilience*

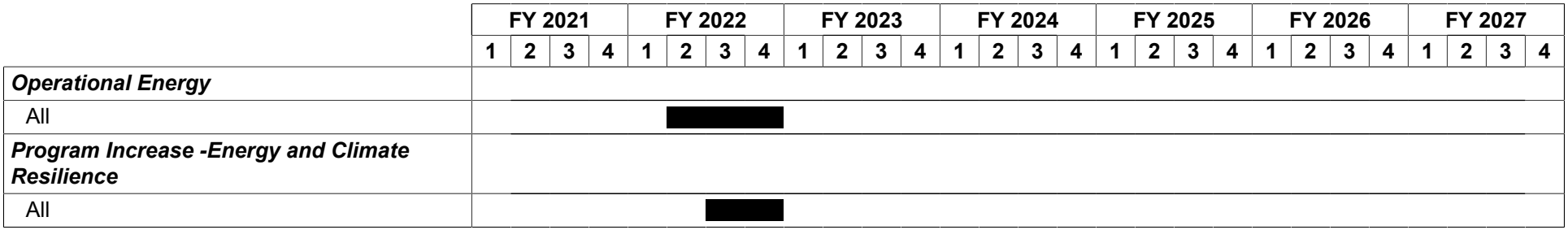

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604860F / *Operational Energy and Installation Resilience*	**Project (Number/Name)** 644860 / *Operational Energy and Installation Resilience*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Operational Energy				
All	2	2022	4	2022
Program Increase -Energy and Climate Resilience				
All	3	2022	4	2022

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0605230F / *Ground Based Strategic Deterrent*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	1,416.291	1,397.485	2,553.541	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5,367.317
641025: *GROUND BASED STRATEGIC DETERRENT (GBSD)*	1,416.291	1,397.485	2,553.541	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5,367.317
Quantity of RDT&E Articles	-	-	4	-	-	-	-	-	-	-		
Program MDAP/MAIS Code: 493												

Note

In FY 2023, Program 0605230F, Ground Based Strategic Deterrent, Project 641025, Ground Based Strategic Deterrent, efforts were transferred to Program 0605238F, Ground Based Strategic Deterrent EMD, Project 655238, Ground Based Strategic Deterrent, in order to account for program transition to System Design and Development (Budget Activity 5).

A. Mission Description and Budget Item Justification

The Ground Based Strategic Deterrent (GBSD) program will design, develop, produce and deploy a replacement for the current Minuteman III (MM III) Intercontinental Ballistic Missile (ICBM) weapon system in order to maintain a safe, secure, reliable, and effective nuclear deterrent. The GBSD program will deliver a fully integrated weapon system beginning in Fiscal Year 2029 to lower lifecycle costs and to close key capability gaps and vulnerabilities identified in the GBSD Capabilities Based Assessment, GBSD Capabilities Development Document, and the GBSD Analysis of Alternatives. GBSD will also mitigate ground-based deterrent degradation due to MM III component age-out and attrition.

The GBSD program will include prime contractor development of applicable support equipment, data, flight test hardware and infrastructure, and training systems while examining and mitigating risk during the MM III to GBSD transition. GBSD program office has partnered with MM III program office to facilitate communication and integration of the weapon system recapitalization during the MM III to GBSD transition. This program includes any needed nuclear surety and certification and system vulnerability assessments.

During the Engineering and Manufacturing Development phase, the GBSD program will execute 1) government system engineering, analytics, and test capability development; 2) air vehicle equipment development; 3) command & launch systems development; 4) launch systems development; 5) support systems development; and 6) weapon system integration.

Government systems engineering investments include development of model-based systems engineering (MBSE), integration, test software, product life-cycle management framework, and modernization of existing system engineering labs and infrastructure. Air vehicle equipment is an integrated missile stack which includes the propulsion, post-boost, guidance, and re-entry systems sub-components. Command & launch encompasses all command and control components and interfaces, associated ground hardware, ground control equipment and associated software directly related to the survivability, monitoring, and launch of the replacement flight

system. Launch systems include launch centers, launch facilities, and structures and associated ground mechanical systems. Support systems include operator and maintainer training systems hardware and software, security system architecture, transport support equipment, program office and weapon system facilities, and peculiar/common support equipment. Weapon system integration risk reduction includes non-proprietary open systems architecture with well-defined interfaces and a modular design at the weapon system level to allow future modification and technology insertion. As GBSD progresses toward Critical Design Review (CDR), the GBSD weapon system design will dictate the parameters for the MILCON real property requirements and their integration with the weapon system component requirements as these are inextricably linked.

Funding allowed the program to execute the Engineering & Manufacturing Development (EMD) Contract to advance GBSD major activities to include systems engineering activities, information technology, data management, analytical capabilities and deliver a flexible, integrated weapon system critical design. The program is modifying, modernizing, and expanding the analytic environment and labs to support EMD activities to enable full execution of the program's capability to own the technical baseline throughout the program life cycle. This involves establishing a digital engineering system including a supporting environment / infrastructure to perform digital activities, collaborate with, and communicate across stakeholders. Based on success during the Technology Maturation & Risk Reduction contract, this program is continuing to examine and mature air vehicle equipment, command and launch, cybersecurity, operator and maintenance training systems hardware and software, security system architecture, transport sub-systems, Peculiar/Common Support Equipment and associated ground technologies. The program is also maturing and refining weapon system and non-operational software, software integration and development, modular system architecture requirements, and product life-cycle management. This requires execution and improvement of the unified certification strategy which meets nuclear surety, cyber security, and nuclear safety requirements. The program is expanding and maturing the analytical, information technology, test, and data management capabilities to ensure access to weapon system design information is properly controlled and securely transmitted between government and contractors. The program continues to develop Vandenberg AFB test capabilities and ensure Western Range Test capabilities for the Flight Test Program. Additionally, the GBSD program is funding all required developmental and operational test and evaluation activities to meet initial and full operational capability milestones including, but not limited to, developing, improving and modernizing test capabilities essential to reaching those milestones when existing test capabilities are inadequate or non-existent. The program is also continuing to integrate requirement for a dual-capable, air based, survivable launch capability. Finally, the program is establishing a government-owned and government-operated DevSecOps/software stack.

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 0605833F or 0605831F. In FY 2021 $27.063M was expended for civilian pay expenses in this program element, and in FY 2022 $37.5M is forecasted for civilian pay expenses in this program element.

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0605230F / *Ground Based Strategic Deterrent*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	1,447.113	2,553.541	0.000	0.000	0.000
Current President's Budget	1,397.485	2,553.541	0.000	0.000	0.000
Total Adjustments	-49.628	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	-49.628	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

Change Summary Explanation

Fiscal Year 2021 funding reflects a Small Business Innovation Research (SBIR) adjustment of $49.628 million.
The Fiscal Year 2022 President's Budget submittal did not reflect Fiscal Year 2023 through Fiscal Year 2026 funding. Therefore, an explanation of the change between the two budget positions for Fiscal Year 2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Engineering & Manufacturing Development (EMD)	1,397.485	2,553.541	0.000

Description: The objectives of EMD for GBSD are: 1) advance GBSD major activities, systems engineering activities, information technology, data management, analytical capabilities and deliver a flexible, integrated weapon system critical design, 2) prototype and test mature technologies related to the major activities and demonstrate performance of sub-system and system capabilities through prototyping and testing and 3) engage in rapid prototyping events to mature future design increments.

FY 2022 Plans:

• Execute the EMD Contract to advance GBSD major activities to include systems engineering activities, information technology, data management, analytical capabilities and deliver a flexible, integrated weapon system critical design.
• Modify, modernize, and expand the analytic environment and labs to support EMD activities to enable full execution of the program's capability to own the technical baseline throughout the program life cycle. This involves establishing a digital engineering system including a supporting environment/infrastructure to perform digital activities, collaborate with, and communicate across stakeholders.
• Continue to examine and mature air vehicle equipment, command and launch, cybersecurity, operator and maintenance training systems hardware and software, security system architecture, transport sub-systems, and associated ground technologies. Define requirements and modular architectures through trade studies, prototyping, demonstration, and analysis.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0605230F / *Ground Based Strategic Deterrent*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
• Continue to mature and refine weapon system and non-operational software, software integration and development, modular system architecture requirements, and product life-cycle management. • Continue to mature the assessment of the current MM III launch systems to determine, through onsite assessments and analysis, the extent of degradation and evaluate for future upgrade, replacement, preparation, and modernization of operational and test facilities. • Execute all government critical path activities to include but not limited to Preliminary Draft Environmental Impact Statement (PDEIS), Coordinating Draft Environmental Impact Studies (EIS), Environmental Baseline Surveys, and Section 106 Programmatic Agreement. • Continue to mature the weapon system by conducting trade studies, system engineering, test activities, and system modeling and simulation. • Continue to further develop analytical, information technology, and data management capabilities. • Implement information systems and information technology design to support EMD execution. • Continue to assess fielding requirements for air vehicle equipment, command & launch, and launch systems and appropriate timelines to transition from MM III to GBSD solution. • Conduct planning for the use of MBSE tools during Operations and Sustainment phase in order to transform ICBM sustainment and supply chain management. • Continue to execute and improve the unified certification strategy which meets nuclear surety, cyber security, and nuclear safety requirements. • Expand and mature the analytical, information technology, test, and data management capabilities to ensure access to weapon system design information is properly controlled and securely transmitted between government and contractors. • Continue to refine Security Classification Guide, update impacts, and implement updates and changes through all Government and contractor programmatic activities. • Continue to increase FFRDC/UARC support to maintain the ability to own the technical baseline in EMD. • Continue to mature support systems to include CSE/PSE and all transportation equipment. • Plan and execute critical software risk reduction activities. • Expand the Information Systems/Information Technology/Information Assurance infrastructure networks and personnel required to support Top Secret, Special Access Programs, and collateral activities and expand capability at mission partner operating locations and network access points. • Develop, improve & modernize government test capabilities required for successful Developmental Test (DT) and Operational Test (OT) including but not limited to, Vandenberg AFB Test capabilities, Western Range Test capabilities, Broad Ocean Area Terminal Area Scoring Test Capability, and various Noise, Vibration and Harshness and Nuclear Hardness and Survivability test sites/beds as required. Modernization and improvement of LF-04 at Vandenberg AFB begins in FY22. • Continue integrating requirement for dual-capable, air-based, survivable launch capability.			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0605230F / *Ground Based Strategic Deterrent*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
• Develop a common cryptographic device and supporting equipment for use in multiple subsystems and/or networks throughout the GBSD weapon system. • Integrate the Mk-21A Reentry Vehicle (Program 0101328F), ICBM Fuze Modernization (Program 0604933F), and GBSD test programs. • Expand government-owned and government-operated DevSecOps/software stack. • Execute all government critical path activities. • Conduct studies and initiatives to build schedule margin, reduce risk in the Minuteman III-to-GBSD transition, and reduce life cycle costs as the program progresses through the EMD phase to the Production phase. • Modify and expand GBSD workspace at all operating locations to accommodate a growing workforce and provide the tools for the workforce to own the technical baseline. ***FY 2023 Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreased due to transition of Engineering and Manufacturing Development efforts to Program 0605238F, Ground Based Strategic Deterrent EMD, Project 655238, Ground Based Strategic Deterrent, in Fiscal Year 2023.			
Accomplishments/Planned Programs Subtotals	1,397.485	2,553.541	0.000

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• RDTE 05 PE 0605238F: *Ground Based Strategic Deterrent EMD*	0.000	0.000	3,614.290	-	3,614.290	3,614.629	3,255.759	3,190.113	2,628.739	3,648.270	19,951.800
• RDTE 04 PE 0603851F: *Intercontinental Ballistic Missile - Dem/Val*	34.755	49.621	46.432	-	46.432	16.717	28.424	7.821	7.995	Continuing	Continuing
• MPAF 01 Line Item MGBSD0: *Ground Based Strategic Deterrent*	0.000	10.895	0.000	-	0.000	610.586	502.720	5,689.931	6,410.554	48,355.610	61,580.296
• MILCON PE 0101233F: *GBSD SQUADRONS*	89.200	168.099	434.000	-	434.000	218.152	301.547	694.984	709.093	6,078.493	8,693.568
• O&M PE 0101233F: *GBSD SQUADRONS*	3.404	20.001	40.915	-	40.915	51.351	90.363	42.767	64.843	0.000	313.644

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0605230F / *Ground Based Strategic Deterrent*

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• OPAF 03 WSC 834130: *AF Physical Security System*	0.000	0.000	2.839	-	2.839	0.000	0.000	0.000	0.000	0.000	2.839

Remarks

E. Acquisition Strategy

The objective of the GBSD program strategy is to deliver a full, integrated weapon system capability that meets Air Force Global Strike Command's Capability Development Document requirements beginning in Fiscal Year 2029. For the Engineering and Manufacturing Development (EMD) phase of this strategy, the Program Office awarded an EMD contract in the 4th quarter of Fiscal Year 2020. The objectives of EMD for GBSD are as follows: 1) to deliver low-risk, technologically mature, integrated weapon system baseline design; 2) develop flexible system architecture with options for future on-ramps and off-ramps to mitigate program risks; 3) embrace MBSE/digital engineering to streamline system development activities and time-lines; 4) align contract incentives to mitigate schedule and performance risk; 5) utilize MBSE processes and tools to create schedule margin and pull surety, safety, cyber, and test activities to the left for time certain delivery; 6) ensure government owns key interfaces and data rights; and 7) pursue "smart commonality" with Navy, Space, and Missile Defense Agency. The EMD phase will include an EMD Baseline Review, Critical Design Review, First Flight Test, Full Functional System Test, System Qualification/System Verification Review, Nuclear Certification, Developmental Test, Operational Test, and will culminate with early production and weapon system deployment. The program will also assess the cost and schedule risks associated with every requirement. The EMD contract includes 5 options for early production and deployment. The period of performance, to include the production and deployment options, is 4th quarter of Fiscal Year 2020 to the second quarter of Fiscal Year 2028. These efforts will ultimately extend the capabilities of the ground-based leg of the nuclear triad through 2075.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0605230F / *Ground Based Strategic Deterrent*	**Project (Number/Name)** 641025 / *GROUND BASED STRATEGIC DETERRENT (GBSD)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TMRR Contractor #1	C/CPFF	Boeing Def, Space, & Sec : Huntsville, AL	261.115	-		-		-		-		-	0.000	261.115	261.115
TMRR Contractor #2	C/CPFF	Northrop Grumman Sys Corp : El Segundo, CA	366.542	-		-		-		-		-	0.000	366.542	370.790
EMD Contract	C/CPIF	Northrop Grumman Sys Corp : El Segundo, CA	121.454	1,079.575	Oct 2020	2,138.292	Oct 2021	-		-		-	0.000	3,339.321	13,293.563
Security Classification Guide Compliance	C/FFP	Lockheed Martin Corp : King of Prussia, PA	1.506	-		-		-		-		-	0.000	1.506	1.506
		Subtotal	750.617	1,079.575		2,138.292		-		-		-	0.000	3,968.484	N/A

Remarks

EMD Contract initiated in the fourth quarter FY20 under Program 0605230F, Ground Based Strategic Deterrent; beginning in FY23, funding shifted to Program 0605238F, Ground Based Strategic Deterrent EMD. Target Value of Contract is $13,293.563 million across both programs.
GBSD TMRR Contractor #1 and #2 contracts were modified to include costs for Security Classification Guide Compliance.
GBSD Security Classification Guide Compliance includes compliance costs for the TMRR unsuccessful offeror.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integration Support Contract	C/FFP	BAE : Hill AFB, UT	235.363	75.000	Oct 2020	74.400	Oct 2021	-		-		-	0.000	384.763	519.735
Naval Surface Warfare Center Crane Support	MIPR	Naval Surface Warfare Center Crane : Crane, IN	23.541	4.098	Nov 2020	5.600	Nov 2021	-		-		-	0.000	33.239	-
Aerospace FFRDC Support	MIPR	Aerospace Corporation : El Segundo, CA	50.238	17.802	Nov 2020	21.416	Nov 2021	-		-		-	0.000	89.456	-
MITRE FFRDC Support	MIPR	MITRE : Bedford, MA	28.227	14.020	Nov 2020	14.035	Nov 2021	-		-		-	0.000	56.282	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0605230F / *Ground Based Strategic Deterrent*	**Project (Number/Name)** 641025 / *GROUND BASED STRATEGIC DETERRENT (GBSD)*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Carnegie Mellon Software Engineering Institute Support	MIPR	Carnegie Mellon : Pittsburgh, PA	5.380	3.270	Nov 2020	3.320	Nov 2021	-		-		-	0.000	11.970	-
Sandia FFRDC Reentry Systems Analysis Support	MIPR	Sandia National Laboratories : Various	26.536	3.828	Oct 2020	4.422	Oct 2021	-		-		-	0.000	34.786	-
MIT Lincoln Labs FFRDC Reentry Systems Analysis Support	MIPR	MIT Lincoln Labs : Lexington, MA	3.988	1.300	Oct 2020	1.600	Oct 2021	-		-		-	0.000	6.888	-
Operations Research Analyst Support	C/FFP	Tecolote Research : Hill AFB, UT	4.754	3.821	Oct 2020	5.290	Oct 2021	-		-		-	0.000	13.865	35.487
Nuclear Surety & Certification Support	MIPR	Various : Various	9.418	0.295	Nov 2020	5.270	Nov 2021	-		-		-	0.000	14.983	-
Common Cryptographic Equipment	MIPR	Sandia National Labs : Various	6.500	13.500	Nov 2020	17.120	Nov 2021	-		-		-	0.000	37.120	-
Mantech Support	RO	Man Tech International : Herndon, VA	10.362	8.287	Dec 2020	11.500	Dec 2021	-		-		-	0.000	30.149	-
GBSD Direct Cite Civilian Pay	Various	US Gov Civilians : Hill AFB, UT	21.234	27.063	Oct 2020	37.461	Oct 2021	-		-		-	0.000	85.758	-
NEPA Analysis Support	MIPR	Various : Various	10.760	10.379	Oct 2020	5.471	Nov 2021	-		-		-	0.000	26.610	-
Reentry Vehicle Sustainment Support	C/CPAF	Lockheed Martin Corp : Bethesda, MD	0.000	0.615	Jan 2021	2.500	Dec 2021	-		-		-	0.000	3.115	-
Sandia Integration Support	MIPR	Sandia National Labs : Various	0.000	0.300	Jan 2021	1.800	Nov 2021	-		-		-	0.000	2.100	-
GBSD Facility Execution Support	MIPR	Various : Various	0.319	2.621	Jan 2021	4.651	Nov 2021	-		-		-	0.000	7.591	-
GBSD Enterprise Support	C/Various	Various : Various	6.853	0.478	Oct 2020	0.650	Dec 2021	-		-		-	0.000	7.981	-
		Subtotal	443.473	186.677		216.506		-		-		-	0.000	846.656	N/A

Remarks

Integration Support Contract and Operations Research Analyst Support contracts initiated under Program 0605230F, Ground Based Strategic Deterrent; beginning in FY23, funding shifted to Program 0605238F, Ground Based Strategic Deterrent EMD. Target Value of Contract reflects value across both programs.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0605230F / *Ground Based Strategic Deterrent*	**Project (Number/Name)** 641025 / *GROUND BASED STRATEGIC DETERRENT (GBSD)*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GBSD is spearheading the Owning The Technical Baseline (OTTB) approach for system acquisition. This approach utilizes additional support efforts that would typically be performed by a Prime Contractor thus increasing costs within Cost Category Items. In order to improve transparency, cost category items were changed as follows: - GBSD Electronic Parts Strategy and Commonality renamed to Naval Surface Warfare Center Crane Support. - GBSD System Engineering and Acquisition Support renamed to Aerospace FFRDC Support. - GBSD Acquisition Support and System Engineering renamed to MITRE FFRDC Support. - GBSD Software Engineering Institute renamed to Carnegie Mellon Software Engineering Institute Support. - GBSD Reentry Systems (RS) FFRDC Support and Analysis renamed Sandia FFRDC Reentry Systems Analysis Support. - GBSD RS FFRDC Analysis and Acquisition Intelligence Support renamed MIT Lincoln Labs FFRDC Reentry Systems Analysis Support. - GBSD Surety and Certification Engineering Services renamed Nuclear Surety & Certification Support. - GBSD Administrative Support moved to Management Services Category. - GBSD Technical Design Agent for NC2 Codes/Crypto renamed to Common Cryptographic Equipment. - GBSD Civilian Manpower renamed Civilian Direct Cite Authority Manpower. - RV LM OEM Support renamed to Reentry Vehicle Sustainment Support.														

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Johns Hopkins - Applied Physics Lab Support	MIPR	Johns Hopkins University-Applied Physics Lab : Laurel, MD	35.222	16.008	Oct 2020	18.060	Oct 2021	-		-		-	0.000	69.290	-
Arnold Engineering Development Complex - Integrated Test Team	PO	Arnold Engineering Development Complex : Arnold AFB, TN	14.965	9.032	Oct 2020	13.653	Oct 2021	-		-		-	0.000	37.650	-
Air Force Operational Test and Evaluation Center - Integrated Test Team	PO	Air Force Operational Test and Evaluation Center : Hill AFB, UT	4.112	2.290	Oct 2020	3.700	Oct 2021	-		-		-	0.000	10.102	-
Missile & Intelligence Center - Integrated Threat	MIPR	DIA-Missile and Space Intelligence	15.061	4.225	Nov 2020	5.000	Nov 2021	-		-		-	0.000	24.286	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0605230F / *Ground Based Strategic Deterrent*	**Project (Number/Name)** 641025 / *GROUND BASED STRATEGIC DETERRENT (GBSD)*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Analysis and Simulation Environment		Center : Redstone Arsenal, AL													
National Air and Space Intelligence Center - Integrated Threat Analysis and Simulation Environment	MIPR	National Air and Space Intelligence Center : Fairborn, OH	1.137	0.000	Dec 2020	1.000	Nov 2021	-		-		-	0.000	2.137	-
Nuclear Dust and Debris Environments Study	MIPR	Air Force Research Lab : Wright Patterson AFB, OH	2.684	0.749	Nov 2020	-		-		-		-	0.000	3.433	-
30th Space Wing Base Support	Various	Various : Various	0.550	0.180	Dec 2020	-		-		-		-	0.000	0.730	-
309th SMXG Software Engineering Support	PO	309th / 517th SWEG : Hill AFB, UT	17.260	15.700	Oct 2020	20.204	Oct 2021	-		-		-	0.000	53.164	-
309th SMXG Nuclear Safety Cross Check Analysis	PO	309th / 516th SWES : Hill AFB, UT	3.973	8.400	Oct 2020	16.211	Oct 2021	-		-		-	0.000	28.584	-
Guidance Instrument Life Testing	MIPR	Aerospace Corporation : El Segundo, CA	7.200	0.000		0.320	Nov 2021	-		-		-	0.000	7.520	-
Silo Fly-out Modeling and Simulation	MIPR	Various : Various	6.091	2.455	Nov 2020	3.321	Nov 2021	-		-		-	0.000	11.867	-
Rapid Assessment Technology	MIPR	Various : Various	4.940	8.470	Mar 2021	4.500	Mar 2022	-		-		-	0.000	17.910	-
Sandia Flight Test Vehicle Development	MIPR	Sandia National Labs : Various	7.700	13.000	Dec 2020	15.500	Dec 2021	-		-		-	0.000	36.200	-
Lawrence Livermore Joint Environmental Test Unit	MIPR	Lawrence Livermore Labs : Livermore, CA	3.500	0.595	Dec 2020	0.500	Dec 2021	-		-		-	0.000	4.595	-
Naval Surface Warfare Center Corona Support	MIPR	Naval Surface Warfare Center : Corona, CA	0.600	1.149	Dec 2020	1.201	Dec 2021	-		-		-	0.000	2.950	-
Guidance Alt PIGA	MIPR	NAVY SSP : Washington Navy Yard, DC	0.000	1.641	Feb 2021	2.200	Nov 2021	-		-		-	0.000	3.841	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0605230F / *Ground Based Strategic Deterrent*	Project (Number/Name) 641025 / *GROUND BASED STRATEGIC DETERRENT (GBSD)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Combined Test Facility	MIPR	Various : Various	0.000	0.000		5.800	May 2022	-		-		-	0.000	5.800	-
RAND Study Support	MIPR	RAND Corp : Santa Monica, CA	0.000	0.700	Jan 2021	-		-		-		-	0.000	0.700	-
Broad Ocean Area Terminal Area Scoring Test Capability	MIPR	Navy Strat Sys Program : Various	0.000	-		4.256	Apr 2022	-		-		-	0.000	4.256	-
GBSD Enterprise Test and Assessments	C/Various	Various : Various	7.303	0.279	Nov 2020	0.302	Nov 2021	-		-		-	0.000	7.884	-
		Subtotal	132.298	84.873		115.728		-		-		-	0.000	332.899	N/A

Remarks

In order to improve transparency, cost category items were renamed as follows:
- GBSD Cybersecurity, Test, and Evaluation Framework, Codes/Crypto renamed to Johns Hopkins - Applied Physics Lab Support.
- GBSD Integrated Test Team renamed to Arnold Engineering Development Complex - Integrated Test Team.
- GBSD Independent Operational Test Agency renamed to Air Force Operational Test and Evaluation Center - Integrated Test Team.
- GBSD Integrated Threat Analysis and Simulation Environment (ITASE) 1 renamed to Missile & Intelligence Center - Integrated Threat Analysis and Simulation Environment.
- GBSD ITASE 2 renamed to National Air and Space Intelligence Center - Integrated Threat Analysis and Simulation Environment.
- GBSD Launch Systems LF-26 (TMRR) renamed to 30th Space Wing Base Support.
- GBSD Software Support renamed to 309th SMXG Software Engineering Support.
- GBSD NSCCA Support renamed to 309th SMXG Nuclear Safety Cross Check Analysis.
- GBSD Instrument Testing renamed to Guidance Instrument Life Testing.
- GBSD / Mission Defense Agency Silo Fly-out Modelling / Simulation Development renamed to Silo Fly-out Modeling and Simulation.
- GBSD Rapid Assessment Technology / LS Support renamed to Rapid Assessment Technology.
- GBSD Joint Test Assembly Encryption renamed to Sandia Flight Test Vehicle Development.
- GBSD Joint Environment Test Unit / Joint Test Assembly National Nuclear Security Agency Cost Share renamed to Lawrence Livermore Joint Environmental Test Unit.
- NSWC Corona Support renamed to Naval Surface Warfare Center Corona Support.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0605230F / *Ground Based Strategic Deterrent*	**Project (Number/Name)** 641025 / *GROUND BASED STRATEGIC DETERRENT (GBSD)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GBSD Administrative Support	C/FFP	Delta Solutions, Inc : Colorado Springs, CO	3.413	0.645	Nov 2020	0.873	Jan 2022	-		-		-	0.000	4.931	-
GBSD Enterprise Process Improvement Support	C/FFP	Booz Allen Hamilton : McLean, VA	2.031	3.501	Nov 2020	11.000	Nov 2021	-		-		-	0.000	16.532	-
Mission Defense Operations	MIPR	Various : Various	0.000	0.242	Aug 2021	3.200	Oct 2021	-		-		-	0.000	3.442	-
Hardware, Software, IT Resources	Various	Various : Various	33.824	6.029	Oct 2020	7.528	Oct 2021	-		-		-	0.000	47.381	-
GBSD DevSecOps, Software Factory, Cloud, & Infrastructure	Various	Various : Various	25.482	28.501	Nov 2020	43.864	Nov 2021	-		-		-	0.000	97.847	-
Enterprise PMA	Various	Various : Various	25.153	7.442	Oct 2020	16.550	Oct 2021	-		-		-	0.000	49.145	-
		Subtotal	89.903	46.360		83.015		-		-		-	0.000	219.278	N/A

Remarks

GBSD Integration Support Contract has been incorporated into the Integration Support Contract in the Support Category.
GBSD Electronic Parts Strategy and Commonality has been incorporated into Naval Surface Warfare Center Crane Support in the Support Category.
GBSD System Engineering and Acquisition Support has been incorporated into the Aerospace FFRDC Support in the Support Category.
GBSD IS/IT Support renamed to Hardware, Software, IT Resources.

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,416.291	1,397.485		2,553.541		-		-		-	0.000	5,367.317	N/A

Remarks

Starting in FY23, GBSD program funding will be reflected in Program Element 0605238F, project 655238.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0605230F / *Ground Based Strategic Deterrent*	**Project (Number/Name)** 641025 / *GROUND BASED STRATEGIC DETERRENT (GBSD)*

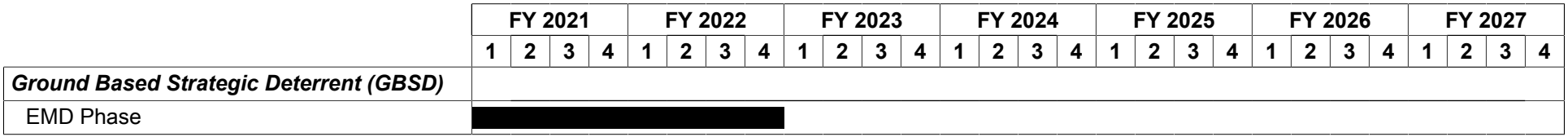

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0605230F / *Ground Based Strategic Deterrent*	**Project (Number/Name)** 641025 / *GROUND BASED STRATEGIC DETERRENT (GBSD)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Ground Based Strategic Deterrent (GBSD)				
EMD Phase	1	2021	4	2022

Note

In FY 2023, Program 0605230F, Ground Based Strategic Deterrent, Project 641025, Ground Based Strategic Deterrent, efforts were transferred to Program 0605238F, Ground Based Strategic Deterrent EMD, Project 655238, Ground Based Strategic Deterrent, in order to account for program transition to System Design and Development (Budget Activity 5).

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0207110F / *Next Generation Air Dominance*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	869.740	1,524.667	1,657.733	0.000	1,657.733	1,655.166	3,017.096	3,527.489	3,536.468	Continuing	Continuing
646007: *AS 2030 Air Dominance Technologies (ADT)*	-	869.740	1,524.667	1,657.733	0.000	1,657.733	1,655.166	3,017.096	3,527.489	3,536.468	Continuing	Continuing

A. Mission Description and Budget Item Justification

Next Generation Air Dominance (NGAD) is a portfolio of technologies enabling Air Superiority for the Joint Force in the most challenging operational environments. The NGAD program is directed by Joint Requirements Oversight Council Memorandum (JROCM) 043-13 and CSAF approved Air Superiority Enterprise Capability Collaboration Team (ECCT) Flight Plan. The program matures technology and reduces risk through development, integration, and test activities. Key NGAD attributes include enhancements in survivability, lethality, persistence, and interoperability across a range of military operations. Program activities will also include the employment of digital acquisitions through the application of digital engineering, agile software development, and open systems architectures. Funding provides program management support, operational concept exploration, technology studies, multi-domain integration assessments, operational and system architecture development, maturation and risk reduction of air superiority related technologies, including weapons systems and integrated system concept development and demonstration. NGAD technologies are available to other DoD systems based on emerging threats, AF priorities, and development capacity. DoD systems incorporating NGAD technologies will include development, integration, and testing of capabilities.

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 0605831F. NGAD civilian pay is executed in program element 0207110F. In FY22 18.700M is forecasted for civilian pay expenses and in FY23 19.261M is forecasted for civilian pay expenses in this program element.

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force					Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*		R-1 Program Element (Number/Name) PE 0207110F / *Next Generation Air Dominance*			
B. Program Change Summary ($ in Millions)	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**
Previous President's Budget	902.440	1,524.667	0.000	0.000	0.000
Current President's Budget	869.740	1,524.667	1,657.733	0.000	1,657.733
Total Adjustments	-32.700	0.000	1,657.733	0.000	1,657.733
• 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	-32.700	0.000			
• Other Adjustments	0.000	0.000	1,657.733	0.000	1,657.733

Change Summary Explanation

FY 2021: -$32.700M SBIR

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0207110F / *Next Generation Air Dominance*	Project (Number/Name) 646007 / *AS 2030 Air Dominance Technologies (ADT)*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
646007: *AS 2030 Air Dominance Technologies (ADT)*	-	869.740	1,524.667	1,657.733	0.000	1,657.733	1,655.166	3,017.096	3,527.489	3,536.468	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Next Generation Air Dominance (NGAD) is a portfolio of technologies enabling Air Superiority for the Joint Force in the most challenging operational environments. The NGAD program is directed by Joint Requirements Oversight Council Memorandum (JROCM) 043-13 and CSAF approved Air Superiority Enterprise Capability Collaboration Team (ECCT) Flight Plan. The program matures technology and reduces risk through development, integration, and test activities. Key NGAD attributes include enhancements in survivability, lethality, persistence, and interoperability across a range of military operations. Program activities will also include the employment of digital acquisitions through the application of digital engineering, agile software development, and open systems architectures. Funding provides program management support, operational concept exploration, technology studies, multi-domain integration assessments, operational and system architecture development, maturation and risk reduction of air superiority related technologies, including weapons systems and integrated system concept development and demonstration. NGAD technologies are available to other DoD systems based on emerging threats, AF priorities, and development capacity. DoD systems incorporating NGAD technologies will include development, integration, and testing of capabilities.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver NGAD weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F. NGAD civilian pay is executed in program element 0207110F. In FY22 $18.700M is forecasted for civilian pay expenses and in FY23 $19.261M is forecasted for civilian pay expenses in this program element.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: 2030+ Air Dominance	869.740	1,524.667	1,657.733
Description: The 2030+ Air Dominance (AD) candidate concepts consist of operational analyses, threat studies and technology candidate assessments and prototyping to identify operational concepts and technologies that improve persistence, survivability, lethality, connectivity, interoperability and affordability in 2030 and beyond. These efforts will provide for contractors to conduct analyses, identify technology candidates and perform concept refinement. Furthermore, studies are required to develop operational/system architectures to include family of systems and spectral dominance platforms. In addition, technical risk reduction activities will be performed to include development, integration, test and building demonstrative prototypes. The 2030+ AD working groups methodically assessed candidate concepts using USAF directives and guidance. Resulting concepts informed the NGAD Analysis of Alternatives (AoA), which was completed in 2019. Ongoing studies are conducted to refine system concepts and operational/system architectures incorporating family of systems and spectral dominance platforms that may be required to inform and support strategic choices. In addition, technical risk reduction studies concerning technology			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0207110F / *Next Generation Air Dominance*	**Project (Number/Name)** 646007 / *AS 2030 Air Dominance Technologies (ADT)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
integration, operational and system trade space utilizing preliminary data from AD concept development have resulted in multiple activities and engagements to inform strategic USAF experimentation and prototyping efforts. Finally, technical overviews were presented to the Air Force - Scientific Advisory Board (AF-SAB) and other senior leaders. ***FY 2022 Plans:*** NGAD will continue to conduct analyses, identify technology candidates and perform concept refinements. Studies required to develop operational/system architectures to include family of systems and spectral dominance platforms will also mature. Technical risk reduction activities will continue to be performed to include development, integration, test and building demonstrative prototypes. Program activities will include the pursuit of open architecture solutions. ***FY 2023 Plans:*** NGAD will continue to conduct analyses, identify technology candidates and perform concept refinements. Studies required to develop operational/system architectures to include family of systems and spectral dominance platforms will also mature. Technical risk reduction activities will continue to be performed to include development, integration, test and building demonstrative prototypes. Program activities will include the pursuit of open architecture solutions. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increased due to program increasing technology maturation, risk reduction activities, and hardware prototyping efforts			
Accomplishments/Planned Programs Subtotals	869.740	1,524.667	1,657.733

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Next Generation Air Dominance acquisition strategy is based on top-down, multi-domain capabilities development planning and oversight framework. Cross-functional teams will conduct analysis, demonstrations, and experiments to quantify the operational value of alternative concepts and technologies to provide solutions to current and future air superiority capability gaps.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0207110F / *Next Generation Air Dominance*	**Project (Number/Name)** 646007 / *AS 2030 Air Dominance Technologies (ADT)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NGAD Research/ Development Efforts	Various	Various : Various	-	834.083		1,475.790		1,607.417		-		1,607.417	Continuing	Continuing	-
		Subtotal	-	834.083		1,475.790		1,607.417		-		1,607.417	Continuing	Continuing	N/A

Remarks

Contractual specifics are not available at this level of security classification.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NGAD Acquisition Support	Various	Various : Various	-	35.657		48.877		50.316		-		50.316	Continuing	Continuing	-
		Subtotal	-	35.657		48.877		50.316		-		50.316	Continuing	Continuing	N/A

Remarks

Includes civilian pay

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	869.740		1,524.667		1,657.733		-		1,657.733	Continuing	Continuing	N/A

Remarks

Details of contract data are not shown because of the level of security classification.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0207110F / *Next Generation Air Dominance*	**Project (Number/Name)** 646007 / *AS 2030 Air Dominance Technologies (ADT)*

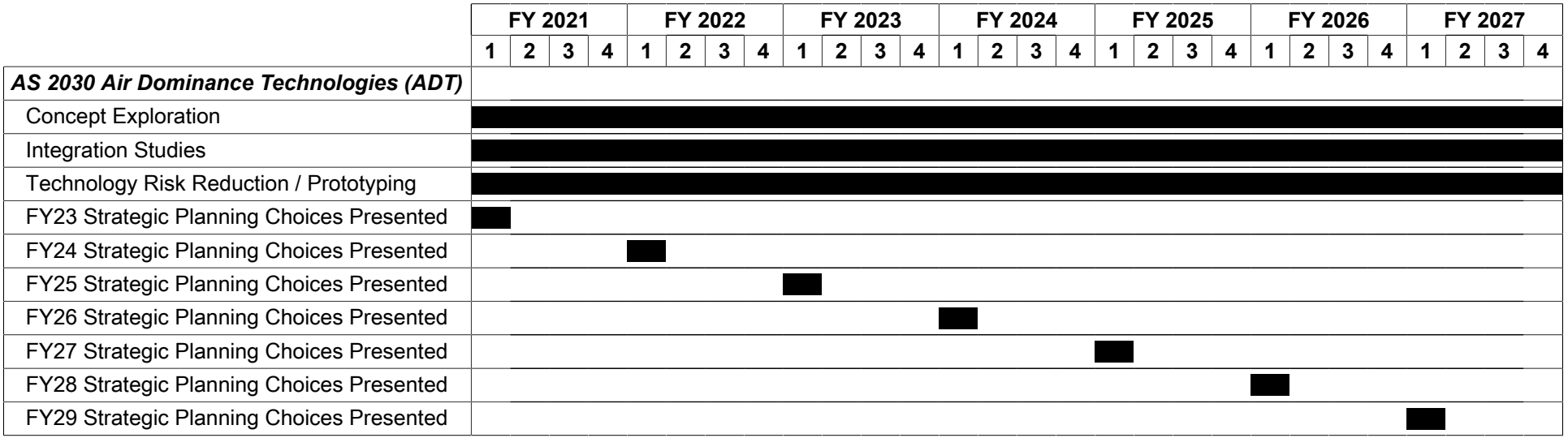

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0207110F / *Next Generation Air Dominance*	**Project (Number/Name)** 646007 / *AS 2030 Air Dominance Technologies (ADT)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
AS 2030 Air Dominance Technologies (ADT)				
Concept Exploration	1	2021	4	2027
Integration Studies	1	2021	4	2027
Technology Risk Reduction / Prototyping	1	2021	4	2027
FY23 Strategic Planning Choices Presented	1	2021	1	2021
FY24 Strategic Planning Choices Presented	1	2022	1	2022
FY25 Strategic Planning Choices Presented	1	2023	1	2023
FY26 Strategic Planning Choices Presented	1	2024	1	2024
FY27 Strategic Planning Choices Presented	1	2025	1	2025
FY28 Strategic Planning Choices Presented	1	2026	1	2026
FY29 Strategic Planning Choices Presented	1	2027	1	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0207179F / *Autonomous Collaborative Platforms*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	0.000	0.000	51.747	0.000	51.747	51.895	0.000	0.000	0.000	0.000	103.642
647123: *Autonomous Collaborative Technologies*	-	0.000	0.000	51.747	0.000	51.747	51.895	0.000	0.000	0.000	0.000	103.642
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Autonomous Collaborative Platform (ACPs) are un-crewed weapon systems primarily focused on projecting air power against adversaries. These new un-crewed air combat vehicles are designed to work in conjunction with current and future aircraft to provide operational flexibility, as directed by Department of the Air Force Leadership. The program matures technology from the Science and Technology (S&T) Skyborg Vanguard program to reduce risk through development, integration and test activities, speeding capabilities to warfighters. Key ACP attributes include tailored cost of platforms, rapidly updateable software, autonomy, interoperability with multiple platforms and network capabilities, agility of use, lethality, and ability to penetrate challenging air environments. Program activities will include the employment of digital acquisitions through the application of digital engineering, agile software development, and open systems architectures. Funding provides program management support, operational concept exploration, technology studies, multi-domain integration assessments, operational and system architecture development, maturation and risk reduction of air superiority related technologies including weapons systems and integrated system concept development and demonstration. Autonomous Collaborative Platform produced through these efforts will provide a competitive advantage in a "safe, secure, and robust" environment.

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 0605831F. In FY22, 0.0M is forecasted to be expended for civilian pay expenses in this program element, and in FY23, 1.9M is forecasted for civilian pay expenses in this program element.

The Autonomous Collaborative Platform program element (0207179F) is new for FY2023. Program element 0207179F, project 647123 is a continuation of previous work accomplished under the Skyborg Vanguard Program. The creation of this program element represents the transition of the Skyborg Vanguard Program from Advanced Technology Development (BA: 03) to Advanced Component Development and Prototypes (BA: 04). Funds requested for PE 0207179F, project 647123 in FY23 are an administrative realignment only and do not constitute a new start.

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0207179F / *Autonomous Collaborative Platforms*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	51.747	0.000	51.747
Total Adjustments	0.000	0.000	51.747	0.000	51.747
• 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	51.747	0.000	51.747

Change Summary Explanation

The Autonomous Collaborative Platform program element (0207179F) is new for FY2023. Program element 0207179F, project 647123 is a continuation of previous work accomplished under the Skyborg Vanguard Program. The creation of this program element represents the transition of the Skyborg Vanguard Program from Advanced Technology Development (BA: 03) to Advanced Component Development and Prototypes (BA: 04). Funds requested for PE 0207179F, project 647123 in FY23 are an administrative realignment only and do not constitute a new start.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Autonomous Collaborative Platform	-	0.000	51.747
Description: The Autonomous Collaborative Platform candidate concepts consist of operational analyses/studies, technology candidate assessments, development, integration, prototyping and demonstrations to identify operational concepts and technologies that project air power against adversaries. Ongoing studies are conducted to refine ACP concepts and air superiority related technologies. ***FY 2022 Plans:*** N/A ***FY 2023 Plans:*** Autonomous Collaborative Platform will conduct analyses, identify technology candidates, perform concept refinement studies, development, integration, prototyping and demonstrations to reduce risk and mature ACP concepts and air superiority related technologies. ***FY 2022 to FY 2023 Increase/Decrease Statement:***			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0207179F / *Autonomous Collaborative Platforms*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Increase due to transition from BA03 to BA04 activities			
Accomplishments/Planned Programs Subtotals	-	0.000	51.747

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

The Autonomous Collaborative Platform acquisition strategy is based on a multi-domain capabilities development planning and oversight framework. Cross-functional teams will conduct analysis, demonstrations, and experiments to quantify the operational value of alternative concepts and technologies to provide solutions to current and future air superiority capability gaps.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0207179F / *Autonomous Collaborative Platforms*	Project (Number/Name) 647123 / *Autonomous Collaborative Technologies*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ACP Research/ Development Efforts	Various	Various : TBD	-	-		-		47.697		-		47.697	Continuing	Continuing	-
		Subtotal	-	-		-		47.697		-		47.697	Continuing	Continuing	N/A

Remarks

Contractual specifics are not available at this level of security classification.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ACP Acquisition Support	Various	Various : TBD	-	-		-		4.050		-		4.050	Continuing	Continuing	-
		Subtotal	-	-		-		4.050		-		4.050	Continuing	Continuing	N/A

Remarks

Includes civilian pay

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		-		51.747		-		51.747	Continuing	Continuing	N/A

Remarks

Contractual specifics are not available at this level of security classification.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0207179F / *Autonomous Collaborative Platforms*	**Project (Number/Name)** 647123 / *Autonomous Collaborative Technologies*

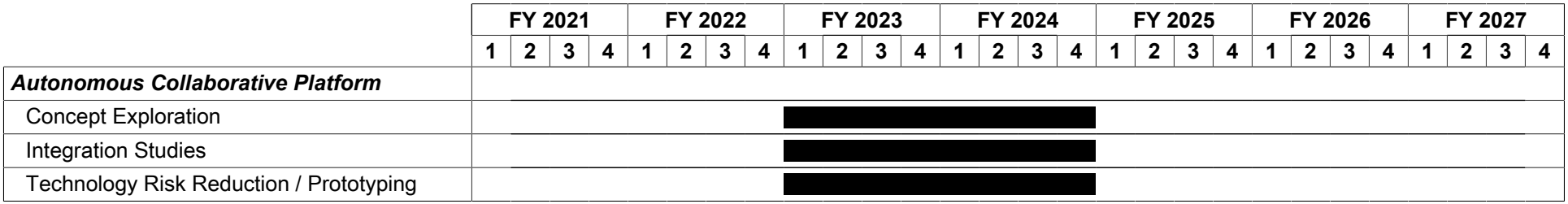

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0207179F / *Autonomous Collaborative Platforms*	**Project (Number/Name)** 647123 / *Autonomous Collaborative Technologies*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Autonomous Collaborative Platform				
Concept Exploration	1	2023	4	2024
Integration Studies	1	2023	4	2024
Technology Risk Reduction / Prototyping	1	2023	4	2024

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force												Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0207455F / *Three Dimensional Long-Range Radar (3DELRR)*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	18.862	0.000	14.490	0.000	14.490	6.228	0.000	0.000	0.000	0.000	39.580
646002: *Three Dimensional Expeditionary Long Range Radar*	0.000	18.862	0.000	14.490	0.000	14.490	6.228	0.000	0.000	0.000	0.000	39.580
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Program MDAP/MAIS Code: 393												

A. Mission Description and Budget Item Justification

The Three-Dimensional Expeditionary Long-Range Radar (3DELRR) is a program will be the principal USAF long-range, ground-based sensor for detecting, identifying, tracking and reporting aerial tracks for the Joint Force Air Component Commander (JFACC) through the Theater Air Control System. The 3DELRR system will provide multiple benefits and increased capabilities to the USAF and to the Joint Services: 1) Replace the aging USAF AN/TPS-75 radar system, which is at the end of its service life and costly to maintain; 2) Detect and track highly maneuverable, small radar cross section air-breathing targets; 3) Mitigate reliability, operational availability, maintainability, transportability and sustainability issues, which plague the AN/TPS-75 radar system; 4) Enable greater battlefield and battlespace awareness through its precise, real-time air picture of sufficient quality to control individual aircraft under a wide range of environmental and operational conditions and 5) Provide exchange of information to the United States Marine Corps, Navy, and Army via appropriate interfaces.

The Air Force conducted a radar market survey in 2019 and identified multiple production-ready alternatives capable of meeting or exceeding 3DELRR requirements. In FY20, the Air Force re-designated 3DELRR as a Middle-Tier Acquisition rapid prototyping effort to demonstrate in FY20 the performance of production-ready systems for meeting 3DELRR requirements.

Based upon the current strategy, the Air Force will use the FY20 prototype capability demonstration results to inform the FY22 Production decision

The total cost of the 3DELRR Rapid Prototyping Middle Tier of Acquisition effort is $298.986 million, including RDT&E and procurement of prototype units. The 3DELRR is fully funded across the Future Years Defense Program.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver 0207455F weapon system capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program element 0207455F. In FY21 0.00M and in FY22 0.00M was expended for civilian pay expenses in this program element.

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0207455F / *Three Dimensional Long-Range Radar (3DELRR)*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	19.321	0.000	0.000	0.000	0.000
Current President's Budget	18.862	0.000	14.490	0.000	14.490
Total Adjustments	-0.459	0.000	14.490	0.000	14.490
• Congressional General Reductions	-0.459	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	14.490	0.000	14.490

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Demonstration & Integration of Production-Ready System to meet 3DELRR capabilities	12.693	0.000	6.837

Description: Collaborative acquisition effort to conduct operational assessment - demonstration of viable, production ready prototypes.

FY 2022 Plans:
Activities supported with FY21 funding will continue into FY22, to include but not limited to:
-Will continue to lead and manage program through daily interaction with contractor and key stakeholders
-Will continue efforts for interoperability with external agencies as required
-Will develop, test, and implement select Contractor Proposed Enhancements based on mission needs
-Will continue to identify, monitor, mitigate and report program and known risks associated with hardware, software and testing
-Will continue required system and sub-system certification work
-Will continue the development of technical manuals and training material
-Will continue and complete demonstrations of viable radars and conduct technical reviews
-Will continue preparation of follow on production decision and associated documentation
-Will begin system integration & interoperability with operational Command and Control (C2) systems
-Will initiate contractor integration testing of components & subsystems
-Will conduct Test Readiness Reviews (TRRs) prior to specific operational & integration test events

FY 2023 Plans:
Activities will include but are not limited to the following:
-Will continue verifying, validating and accrediting modelling & simulation tools for use in test

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0207455F / *Three Dimensional Long-Range Radar (3DELRR)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
-Will continue integrated contractor/gov't DT&E to characterize performance and cyber posture -Will continue preparation for IOT&E and ensure entrance criteria are met -Continue identifying spares through Provisioning Conference -Finalize support equipment requirements -Will continue efforts for interoperability with external agencies as required through FY23 as part of the integration contract -Will develop, test, and implement select Contractor Proposed Enhancements based on mission needs through FY23 and beyond -Will continue required system and sub-system certification work through FY23 -Will continue, finalize and complete the development of technical manuals and training material through FY23 -Will continue preparation of follow on production decision and associated documentation Through FY23 -Will begin system integration & interoperability with operational Command and Control (C2) systems through FY23 -Will initiate contractor integration testing of components & subsystems through FY23 ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 funds increase to support RDT&E follow on work, including system enhancements. FY2022 production units provide operational utility to the warfighter and these performance enhancements bring the system more in line with the full 3DELRR requirements. Demonstration and integration of production ready systems. Implement full complement of EP Techniques. Implement Unique Classification Techniques and Additional Clutter Algorithms Design Radar Templates for other Natural and EA Environments.			
Title: Government Development, Operational & Integration Test and Evaluation Planning and Execution	6.169	0.000	7.653
Description: Planning and execution of Government development, operational, integration test and evaluation. ***FY 2022 Plans:*** Activities supported with FY21 funding will continue into FY22, to include but not limited to: -Will conduct cybersecurity testing -Will conduct Integrated contractor/government DT&E to characterize performance and cyber posture -Will verify, validate, and accredit modeling and simulation tools for use in test -Will continue to lead and manage program through daily interaction with contractor and key stakeholders -Will Continue efforts for interoperability with external agencies as required -Will continue to identify, monitor, mitigate and report program and known risks associated with hardware, software and testing -Will continue required system and sub-system certification work (eg transportation IFF, etc.) -Will continue the development of technical manuals and training material -Will continue and complete demonstrations of viable radars and conduct technical reviews -Will continue preparation of production decision and associated documentation			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0207455F / *Three Dimensional Long-Range Radar (3DELRR)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
-Will begin system integration & interoperability with operational Command and Control (C2) systems -Will initiate contractor integration testing of components & subsystems -Will conduct Test Readiness Reviews (TRRs) prior to specific operational & integration test events -Will conduct Test Readiness Reviews (TRRs) to support Government Developmental Test & Evaluation (DT&E) ***FY 2023 Plans:*** Activities will include but are not limited to the following: -Will continue verifying, validating and accrediting modelling & simulation tools for use in test -Will continue integrated contractor/gov't DT&E to characterize performance and cyber posture -Will continue preparation for IOT&E and ensure entrance criteria are met -Continue identifying spares through Provisioning Conference -Finalize support equipment requirements -Will continue efforts for interoperability with external agencies as required through FY23 as part of the integration contract -Will develop, test, and implement select Contractor Proposed Enhancements based on mission needs through FY23 and beyond -Will continue required system and sub-system certification work through FY23 -Will continue, finalize and complete the development of technical manuals and training material through FY23 -Will continue preparation of follow on production decision and associated documentation Through FY23 -Will begin system integration & interoperability with operational Command and Control (C2) systems through FY23 -Will initiate contractor integration testing of components & subsystems through FY23 ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 funds increase to support RDT&E follow on work including: Plan, execute and report on Developmental Test & Evaluation. Test efforts will focus on the Performance, Cyber and RMA KPPs and KSAs. Integrated test events/data collection will be maximized to ensure early Operational, Test & Evaluation Involvement. Testing supports follow-on production decision to increase radar fleet beyond initial six systems.			
Accomplishments/Planned Programs Subtotals	18.862	0.000	14.490

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• OPAF 03 0207455F: *THREE DIMEN LONG RANGE RADAR (3DELRR)*	0.000	96.186	184.531	-	184.531	34.001	93.900	104.553	130.462	0.000	643.633

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0207455F / *Three Dimensional Long-Range Radar (3DELRR)*

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost

Remarks

E. Acquisition Strategy

The previous 3DELRR strategy was a single-step acquisition approach. A limited competition was conducted for the Engineering and Manufacturing Development (EMD) contract. The EMD contract was awarded 11 May 2017 to a single developer. Due to chronic technical challenges rooted in previous EMD contractor's proposed design and subsequent schedule delays, the USAF concluded the EMD contract in January 2020.

The Milestone Decision Authority (MDA) approved use of a Middle-Tier Acquisition rapid-prototyping strategy in December 2019 to accelerate capability delivery, pursuant to FY16 NDAA Section 804 guidance.

The current 3DELRR strategy is to implement rapid-prototyping, conduct operational assessment demonstrations of viable production-ready alternatives in FY20, and select the best solution that meets 3DELRR requirements in order to make the initial production decision to a single vendor in FY22. This strategy has the potential to deliver capability to the field no later than FY25.

Test activities planned for FY22 and FY23 include but are not limited to rapid-prototyping, demonstration and tailored Developmental Integration Test.

The MDA for the 3DELRR program is the Assistant Secretary of the Air Force (Acquisition). The Air Force Program Executive Officer (PEO) for Digital Directorate (AFPEO) located at Hanscom AFB, MA is the PEO for 3DELRR. The Air Force Life Cycle Management Center (AFLCMC) located at Wright-Patterson AFB, OH is the contracting authority for the 3DELRR program. AFLCMC provides contracting, legal, comptroller, programmatic, engineering, test and logistics support.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0207455F / *Three Dimensional Long-Range Radar (3DELRR)*	**Project (Number/Name)** 646002 / *Three Dimensional Expeditionary Long Range Radar*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Demonstration & Integration (Rapid-Prototyping)	C/TBD	Not specified. : TBD	0.000	7.874	Nov 2020	-		6.347	Nov 2022	-		6.347	104.800	119.021	-
EMD Phase (Prime Contract)	C/FPIF	Raytheon : Woburn, MA	0.000	-		-		-		-		-	0.000	0.000	0.000
		Subtotal	0.000	7.874		-		6.347		-		6.347	104.800	119.021	N/A

Remarks

FINANCIAL PERFORMANCE: 3DELRR is evaluated against traditional Research and Development (R&D) program expenditure benchmarks. Unlike many traditional R&D programs, however, the 3DELLR EMD contract is a FPIF contract with progress payments. Twenty percent of incurred costs were withheld until the end of the contract, when they were liquidated. Mandatory funding obligations and progress payment withholds will cause the program to lag traditional expenditure benchmarks, painting an inaccurate portrait of overall program health.

Due to chronic technical challenges rooted in current EMD contractor's proposed TPS-81 design and subsequent schedule delays, the USAF began conclusion of the current EMD contract after final FPIF contract progress payment in FY19.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Support	C/CPAF	Not specified. : TBD	0.000	-		-		-		-		-	0.000	0.000	-
System Engineering - A	SS/CPFF	MIT/Lincoln Laboratory : Lexington, MA	0.000	0.922	Nov 2020	-		-		-		-	0.000	0.922	-
System Engineering - C	SS/CPFF	GTRI : Atlanta, GA	0.000	0.555	Feb 2021	-		-		-		-	0.000	0.555	-
System Engineering - D	SS/CPFF	MITRE : Bedford, MA	0.000	3.560	Oct 2020	-		-		-		-	0.000	3.560	-
		Subtotal	0.000	5.037		-		-		-		-	0.000	5.037	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0207455F / *Three Dimensional Long-Range Radar (3DELRR)*	**Project (Number/Name)** 646002 / *Three Dimensional Expeditionary Long Range Radar*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	C/CPAF	Not specified. : TBD	0.000	-		-		7.293	Nov 2022	-		7.293	0.000	7.293	-
Government Developmental Test and Evaluation Planning and Preparation	PO	46 TS : Eglin AFB, FL	0.000	1.843	Jan 2021	-		-		-		-	0.000	1.843	-
		Subtotal	0.000	1.843		-		7.293		-		7.293	0.000	9.136	N/A

Remarks

FY21 decreased funding in Test and Evaluation reflects change in the acquisition strategy to a Middle-Tier Acquisition rapid-prototyping program with acceleration of demonstration and analysis into FY20 with follow-on operational system integration and testing in FY21.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Services	C/CPAF	Not specified. : TBD	0.000	-		-		-		-		-	0.000	0.000	-
Program Management Administration	Various	AFLCMC/HBDD : Hanscom AFB, MA	0.000	4.108	Oct 2020	-		0.850	Nov 2022	-		0.850	0.000	4.958	-
		Subtotal	0.000	4.108		-		0.850		-		0.850	0.000	4.958	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	18.862		-		14.490		-		14.490	104.800	138.152	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0207455F / *Three Dimensional Long-Range Radar (3DELRR)*	**Project (Number/Name)** 646002 / *Three Dimensional Expeditionary Long Range Radar*

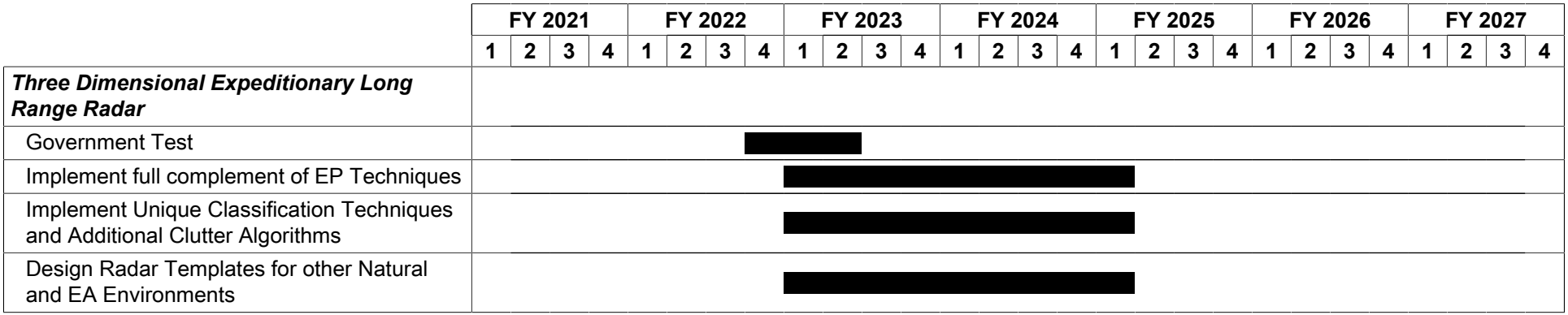

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0207455F / *Three Dimensional Long-Range Radar (3DELRR)*	**Project (Number/Name)** 646002 / *Three Dimensional Expeditionary Long Range Radar*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Three Dimensional Expeditionary Long Range Radar				
Government Test	4	2022	2	2023
Implement full complement of EP Techniques	1	2023	1	2025
Implement Unique Classification Techniques and Additional Clutter Algorithms	1	2023	1	2025
Design Radar Templates for other Natural and EA Environments	1	2023	1	2025

Note

Schedule is restricted to the current, approved funding profile and allows for completion of rapid prototyping, test and integration efforts that will lead to a production contract decision.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0207522F / *Airbase Air Defense Systems (ABADS)*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	8.451	10.905	52.498	0.000	52.498	85.509	5.592	7.814	10.102	Continuing	Continuing
640410: *Tech Maturation & Risk Reduct*	-	8.451	10.905	52.498	0.000	52.498	85.509	5.592	7.814	10.102	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 4, PE 0207522F, project 640410, Battle Management Command and Control (BMC2), is a new start.

In FY 2021, PE 0604287F, Physical Security Equipment, Project 655120, Physical Security Equipment - SD ED efforts were transferred to PE 0207522F, Airbase Air Defense Systems (ABADS), Project 640410, Tech Maturation & Risk Reduction.

A. Mission Description and Budget Item Justification

The Airbase Air Defense Systems (ABADS) program is the principal USAF program to provide the ability to detect, track, identify, and defeat airborne threats to missions and assets including small-unmanned aircraft systems (sUAS), Rockets, Artillery and Mortars (RAM), and Missiles. The counter-sUAS (C-sUAS), counter-RAM (C-RAM), and BMC2 efforts to counter missiles seek to protect strategic assets vital to national security. ABADS efforts protects personnel and assets whether CONUS or deployed in theater. Regarding C-sUAS, to counter the threats posed by the rapid proliferation of inexpensive yet highly-capable systems, and the enemies who target US Service members, Allies, and Coalition partners, the ABADS program will continue to analyze evolving threats, evaluate new capabilities, and design an open-system architecture that reduces life cycle cost and enables fielding to all 180+ AF installations. The Air Force works closely with the DoD Joint C-sUAS Office to align annual efforts.

ABADS FY2023 funding will further develop Command, Control, Communication, Computers, and Intelligence (C4I) systems. The centerpiece of this effort is the Medusa Command and Control (C2) system, whose Modular Open-Systems Architecture enables rapid integration with the Advanced Battle Management System (ABMS), Link 16, and Universal Command & Control (UC2). The Medusa C2 system supports Joint All-Domain Command & Control (JADC2) development and employs electronic warfare capabilities, artificial intelligence for operator task automation, a closed-loop training system for operator certification and proficiency, and track fusion.

Battle Management Command and Control (BMC2) FY2023 funding will leverage Air Force and Joint command and control capabilities to develop a prototype BMC2 capability optimized for Air Force defense of air bases and other critical infrastructure against massed precision missile attacks, which represents a major challenge in a high-end fight. In response, the Air Force will integrate the prototype battle management system with existing sensors, and a classified non-kinetic defense capability at a U.S. location, and field production representative base defense prototypes at one base in the US Indo-Pacific Command (USINDOPACOM) Area of Responsibility (AOR) and one base in the US European Command (USEUCOM) AOR to support theater specific integration and assessments. This capability requires a system of systems approach and will be integrated into JADC2 and ABMS.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0207522F / *Airbase Air Defense Systems (ABADS)*

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Air Base Air Defense System capabilities for emergent or unanticipated 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, 0605832F, 0605833F, 0605898F, 0606398F. In FY21 0.053M was expended for civilian pay expenses in this program element. In FY22 0.251M is forecasted for civilian pay expenses in this program element.

This requirement supports performance of a full financial audit as required by title 10 U.S.C. Chapter 9A, Sec 240-D.

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

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	8.721	10.905	0.000	0.000	0.000
Current President's Budget	8.451	10.905	52.498	0.000	52.498
Total Adjustments	-0.270	0.000	52.498	0.000	52.498
• 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	-0.270	0.000			
• Other Adjustments	0.000	0.000	52.498	0.000	52.498

Change Summary Explanation

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Airbase Air Defense Systems (ABADS)	8.451	10.905	5.330
Description: The ABADS program will continue to defend against the emerging and growing airborne threats. This program protects strategic assets vital to national security while bedded down and while on the move. This program will continue to counter emerging threats posed by advancements in enemy employment tactics and commercially available technology.			
FY 2022 Plans:			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0207522F / *Airbase Air Defense Systems (ABADS)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
- Update Medusa C2 software to support the ABMS architecture, enhance interoperability with the Air Force Integrated Base Defense Enterprise, improve operator task automation, further modularize system components, and resolve deficiencies. - Develop and test the Continuous Integration/Continuous Delivery (CI/CD) pipeline to accelerate response times to emerging threats. - Continue electronic warfare upgrades, to include but not limited to new sensor and effector components, and new Ninja skills which leverage full Ninja capability within Medusa C2. - Transition urgent need efforts to an AF Program of Record. - Continue efforts in alignment with the DoD's Joint C-sUAS Office. ***FY 2023 Plans:*** - Update Medusa C2 software to further interoperability and incorporation within the ABMS architecture. - Implement the CI/CD pipeline to accelerate response times to emerging threats. - Continue electronic warfare upgrades, to include but not limited to new sensor and effector components, and new Ninja skills which leverage full Ninja capability within Medusa C2. - Continue efforts in alignment with the DoD's Joint C-sUAS Office. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The funding decrease in FY23 aligns AF RDT&E efforts with DoD Joint C-sUAS Office direction.			
Title: Battle Management Command and Control (BMC2) ***Description:*** The initial phase of this effort will leverage Air Force and Joint command and control capabilities to develop a prototype BMC2 capability optimized for Air Force defense of air bases and other critical infrastructure. The Air Force will integrate the prototype battle management system with existing sensors, and a classified non-kinetic defense capability at a U.S. location, and field production representative base defense prototypes at one base in the USINDOPACOM AOR and one base in the USEUCOM AOR to support theater specific integration and assessments. ***FY 2022 Plans:*** BMC2 is a new start in FY23. ***FY 2023 Plans:*** - Define Battle Management Command and Control (BMC2) system requirements. - Develop BMC2 architecture. - Identify and assess candidate BMC2 solutions. ***FY 2022 to FY 2023 Increase/Decrease Statement:***	-	0.000	47.168

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0207522F / *Airbase Air Defense Systems (ABADS)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
The funding increase in FY23 supports a large number of contractual activities to develop a working prototype in a relevant operational timeline.			
Accomplishments/Planned Programs Subtotals	8.451	10.905	52.498

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• OPAF 03 0207522F: *Airbase Air Defense Systems (ABADS)*	9.108	27.186	23.911	-	23.911	5.029	9.529	12.052	12.289	Continuing	Continuing

Remarks

E. Acquisition Strategy

Implement a "Government-as-the-Integrator" approach by procuring integration services independent of systems being developed through existing integration service contracts within the DoD. The services will establish processes and support tools to enable integration of planned projects. Example integration services include, but are not limited to, establishing a continuous integration/continuous deployment (CI/CD) software pipeline, implementing Agile DevSecOps processes and deploying model-based design. Leverage small business innovative research opportunities to generate new code to produce capabilities for detection and defeat of airborne threats. Leverage urgent need support contracts to develop innovative and incremental changes to systems fielded for C-sUAS and urgent operational needs, and expanding to other airborne threats. Accomplish system verification-fix-verification loops earlier in the lifecycle for planned projects by leveraging independent integration services from systems being developed. Integration services will be acquired from existing integration service contracts within the DoD.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0207522F / *Airbase Air Defense Systems (ABADS)*	Project (Number/Name) 640410 / *Tech Maturation & Risk Reduct*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
C-sUAS Joint Serv System Development	Various	Not specified. : TBD	-	-		1.704	Jul 2022	1.552	Nov 2022	-		1.552	Continuing	Continuing	-
C-sUAS New Platform Development	Various	Not specified. : TBD	-	-		0.500	Jan 2022	1.376	May 2023	-		1.376	Continuing	Continuing	-
C-sUAS Software Development	Various	Not specified. : TBD	-	6.629	Apr 2021	3.200	Jul 2022	1.852	May 2023	-		1.852	Continuing	Continuing	-
BMC2 Prototypes	Various	Not specified. : TBD	-	-		-		34.000	Feb 2023	-		34.000	Continuing	Continuing	-
		Subtotal	-	6.629		5.404		38.780		-		38.780	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Direct Cite Authority	TBD	Not specified. : TBD	-	0.085	Jun 2021	0.251	Apr 2022	-		-		-	Continuing	Continuing	-
		Subtotal	-	0.085		0.251		-		-		-	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
C-sUAS Test	Various	Not specified. : TBD	-	1.737	Jun 2021	1.100	Jun 2022	-		-		-	Continuing	Continuing	-
		Subtotal	-	1.737		1.100		-		-		-	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
C-sUAS Systems Engineer	C/Various	Various : Hanscom, MA	-	-		3.950	Jul 2022	-		-		-	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0207522F / *Airbase Air Defense Systems (ABADS)*	**Project (Number/Name)** 640410 / *Tech Maturation & Risk Reduct*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
C-sUAS Management Services	C/Various	Various : Hanscom, MA	-	-		0.200	Jul 2022	0.550	Feb 2023	-		0.550	Continuing	Continuing	-
BMC2 Systems Engineer	C/Various	Not specified. : TBD	-	-		-		12.174	Nov 2022	-		12.174	Continuing	Continuing	-
BMC2 Management Services	C/Various	Not specified. : TBD	-	-		-		0.994	Nov 2022	-		0.994	Continuing	Continuing	-
		Subtotal	-	-		4.150		13.718		-		13.718	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	8.451		10.905		52.498		-		52.498	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0207522F / *Airbase Air Defense Systems (ABADS)*	**Project (Number/Name)** 640410 / *Tech Maturation & Risk Reduct*

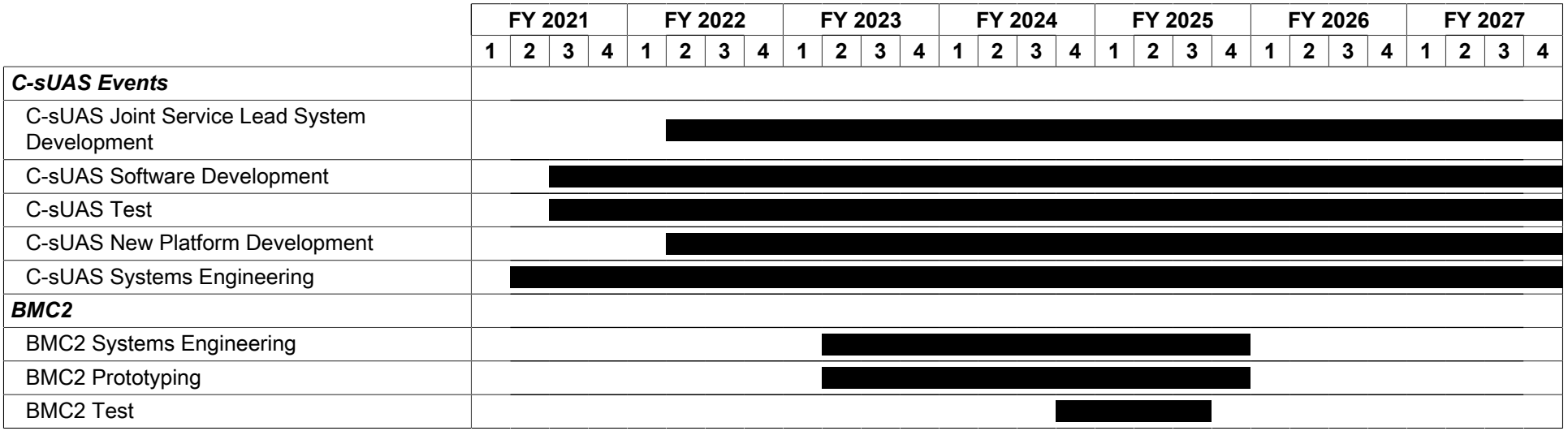

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0207522F / *Airbase Air Defense Systems (ABADS)*	**Project (Number/Name)** 640410 / *Tech Maturation & Risk Reduct*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
C-sUAS Events				
C-sUAS Joint Service Lead System Development	2	2022	4	2027
C-sUAS Software Development	3	2021	4	2027
C-sUAS Test	3	2021	4	2027
C-sUAS New Platform Development	2	2022	4	2027
C-sUAS Systems Engineering	2	2021	4	2027
BMC2				
BMC2 Systems Engineering	2	2023	4	2025
BMC2 Prototyping	2	2023	4	2025
BMC2 Test	4	2024	3	2025

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0208030F / *War Reserve Materiel - Ammunition*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	0.000	3.943	10.288	0.000	10.288	10.315	10.319	10.325	10.428	Continuing	Continuing
648030: *Operational Weaponeering and Analysis*	-	0.000	3.943	10.288	0.000	10.288	10.315	10.319	10.325	10.428	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The AF will assume operational support and development of the Integrated Munitions Effects Assessment (IMEA) software program from the Defense Threat Reduction Agency starting FY22.

A. Mission Description and Budget Item Justification

The Operational Weaponeering and Analysis (OWA) provides weapons' effectiveness data and classified software Modeling and Simulation (M&S) tools to support the Air Force (AF) Master Plan objectives and National Defense Strategy within Combatant Commands (COCOMs), and Major Commands (MAJCOMS). OWA provides mission critical National Security Software (NSS) to meet instructions and directives found in CJCSI 3160 and 3170, as well as, AFI 14-401 and JP 3-60. M&S classified software tools are operationally critical to overall mission success and weapons employment. Weapons employment is not legally possible until a complete target and weapon analysis has been completed. The classified M&S software tools are in constant development to support evolving weapon phenomenology (directed energy, high power microwave, cyber, hypersonic, etc.) and target modeling of a wide range of multi-domain targets, which includes structural, ground mobile, ships, and more.

The Integrated Munitions Effects Analysis (IMEA) software is a classified mission critical program that provides Air Force Operational Warfighters with unique analytical capabilities. These unique capabilities are associated with Hard Deeply Buried Targets (HDBTs), Nuclear Weapons, and Weapons of Counter Mass Destruction (C-WMD) weapons employment. In addition, IMEA also analyzes national strategic sites facility defeat information with Nuclear and WMD weapons in support of Global Strike Command operational warfighter requirement. IMEA is also the only software, which is program of record for Massive Ordinance Penetrator (MOP) and Massive Ordinance Air Blast (MOAB) lethality estimates in DoD.

The Air Force Target and Effect Software (AFTES) provides an all-domain weapon and target capability to support Advanced Target Development and Intermediate Target Development within ACC and Joint environments. This classified software creates software that is digital, agile, and open. The tool is focused on integration of capabilities from ABMS into the JADC2 environment within a single open M&S Engagement Framework to provide capabilities to the tactical edge. In addition, AFTES will draw it requirements from the ACC Agile Combat Employment (ACE) LOE to meet objectives laid out by the CSAF.

In addition to operational support, IMEA and AFTES provides analytical reachback for both operational and weapon acquisition communities. OWA also aligns with Air Force Research Laboratory (AFRL) and Defense Threat Agency (DTRA) Research and Development (R&D) weapon lethality and effectiveness missions to create an R&D pipeline of capabilities all maintained in a single M&S software framework which allows the software to be easily developed, deployed, and maintained within the Operational Weaponeering and Analysis Division.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0208030F / *War Reserve Materiel - Ammunition*

The AF will assume operational support and development of the IMEA program from the Defense Threat Reduction Agency starting FY22. DTRA will continue to support Air Force with basic R&D research of new capabilities associated with HDBT, Nuclear, and WMD as defined by MOA between DTRA and the AF. OWA has become the operational transition partner for DTRA and AFRL to integrate and field all weapon and target R&D technology to AF and other Joint Environments.

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 FY21 $0.0M was expended for civilian pay expenses in this program element, and in FY22 $0.300M is forecasted for civilian pay expenses in this program element.

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

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.000	3.943	0.000	0.000	0.000
Current President's Budget	0.000	3.943	10.288	0.000	10.288
Total Adjustments	0.000	0.000	10.288	0.000	10.288
• 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	10.288	0.000	10.288

Change Summary Explanation

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Operational Weaponeering and Analysis	0.000	3.943	10.288	0.000	10.288
Description: The Operational Weaponeering and Analysis (OWA) provides weapons' effectiveness data and classified software Modeling and Simulation (M&S) tools to support the Air Force (AF) Requirements Process, Combatant Commands (COCOMs), and Major Commands (MAJCOMS).					

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0208030F / *War Reserve Materiel - Ammunition*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
FY 2022 Plans: Conduct Operational Users Working Group (OUWG) reviews, providing a singularly unique forum for AF and Joint service level demonstrations of developmental methodologies and data to support weapon and target effectiveness. Collect, assess and inject operational user and analyst end user feedback into product development cycles. Exploit Agile Continuous Integration and Continuous Development (CI/CD) pipeline to provide Technical Previews (TPs) of evolving phenomenology models and operational capabilities. Develop common target and weapon data models to support multi-domain capabilities within a common AF and Joint M&S lethality framework. All weapon data, target data and methodology will be hosted in a the Air Force Combined Effects Repository (AFCER). The repository will be hosted on the AF WeaponOne (W1) Digital Engineering P1 environment. Refactor IMEA weapon and target data and methodologies into a common engagement lethality architecture to enable CI/CD pipeline. Develop, validate, and accredit improved computer vulnerability and weapons effectiveness in support of warfighter requirements. Integrate Verification, Validation and Accreditation (VV&A) and Independent Verification and Validation (IV&V) efforts into Agile product development processes.					
FY 2023 Base Plans: OWA will create an AF Weapon and Target (WEPTAR) Operational Users Working Group to review and approve software and targets supported in OWA software tools. OWA will provide this singularly unique forum for AF and Joint service level demonstrations of developmental methodologies and data to support weapon and target effectiveness. Collect, assess and inject operational user and analyst end user feedback into the product backlogs to enhance 'Speed to Fleet' efforts. Continue development and accreditation of the DEVSECOPS pipeline tool stack to support Agile Continuous Integration and Continuous Development (CI/CD) pipeline and provide quarterly Technical Product Previews (TPPs) of evolving phenomenology models and operational capabilities all vetted by the WEPTAR Operational Community stakeholders.					

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0208030F / *War Reserve Materiel - Ammunition*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Focus on all domain development to include kinetic and directed energy in FY23 to create KE/DE synergistic effects. Being review of Cyber integration into the EndGame Framework architecture. Continue kinetic weapon development to support target and new weapon data models including hypersonics to support multi-domain capabilities within both IMEA and AFTES using the EndGame Enterprise framework to support a common AF and Joint M&S lethality framework. All weapon data, target data and methodology will be hosted in a the Air Force Combined Effects Repository (AFCER). The repository will be hosted on the AF WeaponOne (W1) / RogueOne (R1) Digital Engineering environment. Refactor IMEA weapon and target data and methodologies into a common engagement lethality architecture to enable CI/CD continuous Approval to Operate (cATO) pipeline using by AFTES. Continue to develop AFTES using the AFCER pipeline capabilities that will allow leveraging of hydrocode capabilities developed and supported by Department of Energy (DoE) national labs R&D community. Develop, validate, and accredit improved computer vulnerability and weapons effectiveness in support of warfighter requirements. Integrate Verification, Validation and Accreditation (VV&A) and Independent Verification and Validation (IV&V) efforts into Agile product development processes. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increased because the AF assumes full responsibility for IMEA from DTRA.					
Accomplishments/Planned Programs Subtotals	0.000	3.943	10.288	0.000	10.288

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• PAAF 01 355990: *Items Less Than $5*	-	9.164	-	-	-	-	-	-	-	Continuing	Continuing

Remarks

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0208030F / *War Reserve Materiel - Ammunition*

E. Acquisition Strategy

Performance-based contracts are primarily used for this support. IMEA and AFTES will maximize the use of competitive awards and uses various contract types, employs large and small contractors, and is focused to achieve agency socio-economic goals and incorporate DoD acquisition reform initiatives.

Both AFTES and IMEA are paralleling AF Digital Engineering contracting effort to add Agile capabilities into performance contracts. IMEA and AFTES use physics based modeling requiring specialized methodology development unique to specific weapon capabilities. The Operational and Analysis (OWA) has identified multiple sources of software development include both commercial and defense working capital.

OWA identified multiple contacts to support software development efforts including five year IDIQs awarded by Army Contracting Command (ACC), General Services Administration (GSA), and Air Force. We are working to award additional GSA contracts to support software development in the for outyear development.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0208030F / *War Reserve Materiel - Ammunition*	**Project (Number/Name)** 648030 / *Operational Weaponeering and Analysis*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Munitions Effectiveness Assessment (IMEA)	C/CPFF	ARA Inc. : Raleigh, NC	-	-		3.325	Jan 2022	8.848	Dec 2022	-		8.848	Continuing	Continuing	-
Air Force Targeting and Effects Software (AFTES)	C/CPFF	Multiple : Fort Walton Beach, FL	-	-		0.268	Oct 2021	1.040	Dec 2022	-		1.040	Continuing	Continuing	-
		Subtotal	-	-		3.593		9.888		-		9.888	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contracts Management Support	RO	AFLCMC/EZW : Eglin AFB, FL	-	-		0.300	Oct 2021	0.350	Oct 2022	-		0.350	Continuing	Continuing	-
Travel for Program Management	RO	AFLCMC/EZW : Eglin AFB, FL	-	-		0.050	Oct 2021	0.050	Oct 2022	-		0.050	Continuing	Continuing	-
		Subtotal	-	-		0.350		0.400		-		0.400	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		3.943		10.288		-		10.288	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0208030F / *War Reserve Materiel - Ammunition*	**Project (Number/Name)** 648030 / *Operational Weaponeering and Analysis*

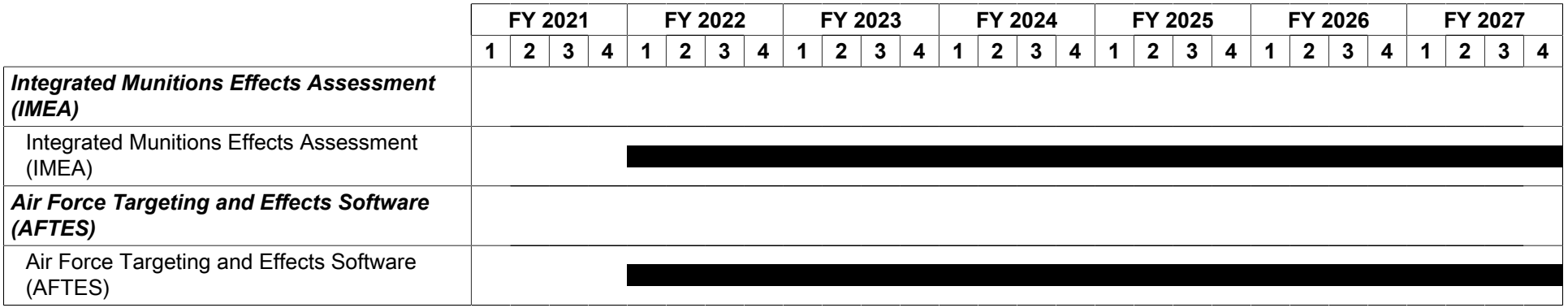

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0208030F / *War Reserve Materiel - Ammunition*	**Project (Number/Name)** 648030 / *Operational Weaponeering and Analysis*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Integrated Munitions Effects Assessment (IMEA)				
Integrated Munitions Effects Assessment (IMEA)	1	2022	4	2027
Air Force Targeting and Effects Software (AFTES)				
Air Force Targeting and Effects Software (AFTES)	1	2022	4	2027

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0208099F / *Unified Platform (UP)*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	5.869	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.869
646504: *AF Prototyping*	-	2.874	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.874
646505: *USCYBERCOM Prototyping*	-	2.995	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.995

Note

In FY 2021, Project 646504, AF Prototyping completed.

In FY 2021, Project 646505, USCYBERCOM Prototyping completed.

A. Mission Description and Budget Item Justification

Unified Platform provides the Cyber Mission Forces, U.S. Cyber Command (USCYBERCOM), AF Major Commands (MAJCOM), and Service cyber components a Joint cyber operations infrastructure enabling full spectrum cyberspace operations at the operational through tactical levels of warfare. The DoD, AF, and the Cyber Mission Force require an interconnected and interoperable cyber infrastructure to conduct integrated planning and execution of cyberspace operations. Unified Platform delivers this capability through the integration of disparate, Service-specific platforms and systems, infrastructure, mission capabilities, data analytics, and programs to build interoperable and scalable network for cyber capabilities. A common, Unified Platform allows the DoD to achieve and maintain decision and operational superiority, the key to successful cyber operations within the highly dynamic cyberspace domain.

Unified Platform rapid prototyping efforts integrate Service-specific cyber capabilities and explore novel cyber technologies culminating in an initial Unified Platform capability (e.g. minimum viable product). The rapidly evolving cyberspace domain requires flexibility in which rapid prototyping activities inform the initial Unified Platform capability baseline through the early stages of technology maturation and delivery. Rapid prototyping efforts are executed in an operational development environment to expedite development and evaluation of cyber capabilities within relevant warfighter timelines and are transitioned to Foundational Efforts (BA 7, PE 0208099F Unified Platform, 672281 Foundational Efforts) once included in the Unified Platform baseline.

The Secretary of the Air Force leads the Unified Platform effort as Executive Agent on behalf of the Department of Defense. Unified Platform directly supports the Joint Network Attack Initial Capabilities Document (ICD), the National Military Strategy for Cyberspace Operations (NMS-CO), USCYBERCOM operational directives, the latest MAJCOM Offensive Cyberspace Operations System Flight Plan, and other formal requirements documents.

Prototyping effort ended in FY21.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver weapon system capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program element 0605827F, 0605828F, 0605829F, 0605831F, 0605832F, 0605833F, 0605898F,

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0208099F / *Unified Platform (UP)*

0606398F. In FY21 $0.000M was expended for civilian pay expenses in this program element, and in FY22 $0.000M is forecasted for civilian pay expenses in this program element.

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

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	5.979	0.000	0.000	0.000	0.000
Current President's Budget	5.869	0.000	0.000	0.000	0.000
Total Adjustments	-0.110	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	-0.110	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0208099F / *Unified Platform (UP)*	Project (Number/Name) 646504 / *AF Prototyping*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
646504: *AF Prototyping*	-	2.874	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.874
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The rapidly evolving cyberspace domain demands highly flexible requirements, acquisition activities, and operations to respond to emerging opportunities or mitigate adversary actions. Salient to this mission area, rapid prototyping activities provide the structure to rapidly develop, evaluate, and integrate new cyber capabilities and inform the initial Unified Platform capability baseline during the early stages of technology maturation and delivery. Air Force Prototyping efforts support this need through rapid and exploratory research, prototype development, risk reduction, testing, and integration of cyber capabilities contributing to early operational development of the Unified Platform capability baseline. The USAF in conjunction with the Services and National Agencies execute operationally focused research and development and rapid prototyping to explore and determine validity of potential infrastructure, architectures, and capabilities/tools to support Cyber Mission Forces. These rapid prototyping efforts are tailored for near-immediate integration into the Unified Platform baseline (BA 7, PE 0208099F Unified Platform, BPAC 672281 Foundational Efforts) for delivery to cyber warfighters.

Prototyping effort ended in FY21.

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 FY21 0.000M was expended for civilian pay expenses in this program element, and in FY22 0.000M is forecasted for civilian pay expenses in this program element.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: AF Prototyping	2.874	0.000	0.000	0.000	0.000
Description: AF prototyping efforts initially developed the UP Minimum Viable Product (MVP) baseline from existing "best of breed" systems, completed prototyping efforts, existing Service-developed solutions, joint user-input, and other sources					
FY 2022 Plans: Prototyping effort ended in FY21.					
FY 2023 Base Plans: Prototyping effort ended in FY21.					
FY 2023 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0208099F / *Unified Platform (UP)*	**Project (Number/Name)** 646504 / *AF Prototyping*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A					
Accomplishments/Planned Programs Subtotals	2.874	0.000	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• RDTE 07 0208099F: *Unified Platform (UP)*	84.491	91.893	107.548	-	107.548	0.000	0.000	0.000	0.000	Continuing	Continuing
• OPAF 03 835080: *AFNET*	-	-	-	-	-	-	-	-	-	0.000	0.000
• OPAF 03 834320: *C3 Countermeasures*	4.956	4.904	5.013	-	5.013	0.000	0.000	0.000	0.000	Continuing	Continuing

Remarks

Beginning in FY21 associated OPAF realigned from Line Item 835080 (AFNET) to Line Item 834320 (C3 Countermeasures) for clarity in reporting.

D. Acquisition Strategy

Unified Platform represents a flexible, interoperable, and scalable warfighter capability to be employed by the Army, Navy, Marine Corps, and Air Force in conjunction with U.S. Cyber Command (USCYBERCOM). In order to match the speed of need of the highly dynamic cyberspace domain, the Service-agnostic Unified Platform capability implements an agile development framework to facilitate the rapid development, integration, and fielding of capabilities to remain responsive to evolving warfighter requirements. The Unified Platform program executes the agile development requirements provided by the Army, Navy, Marine Corps, Air Force, and USCYBERCOM stakeholders in accordance with the prioritization provided by the multi-Service Unified Platform governance structure.

The initial Unified Platform capability delivers a minimum viable product (MVP) for immediate deployment and operational use by the Cyber Mission Force. Subsequent build iterations continue to deliver enhanced capabilities, incrementally building the Unified Platform capability to match warfighter needs and requirements to achieve cyberspace dominance. Early development of the Unified Platform baseline capability relies on extensive rapid prototyping efforts to analyze integration constraints and opportunities of Service-specific cyber capabilities to realize the Unified Platform MVP and inform the future Unified Platform baseline (BA 4, PE 0208099F Unified Platform, 646504 AF Prototyping and 646505 USCYBERCOM Prototyping). In parallel, an enduring foundational Unified Platform thrust area supports the development and maturation of Unified Platform baseline, integrates successful prototyping activities, and implements an agile development/security/operations (DevSecOps) construct to rapidly evolve and enhance the Unified Platform capability to match warfighter requirements (BA 7, PE 0208099F Unified Platform, 672281 Foundational Efforts).

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0208099F / *Unified Platform (UP)*	**Project (Number/Name)** 646504 / *AF Prototyping*

The Unified Platform program office utilizes Concept, Development, Risk management, Production, or Deployment Plans as part of a streamlined approach to agile acquisition planning. All plans contain sufficient information to inform acquisition decisions (i.e., authorities to proceed), within the agile framework, to determine readiness to enter into the applicable phase of the acquisition process. Unified Platform utilizes both new and existing contractual vehicles, such as Government-Wide Acquisition Contract (GWAC) vehicles (Alliant, Encore II, Solutions for Enterprise-Wide Procurement IV (SEWP IV), and General Services Administration (GSA) Federal Supply Schedules and a new Cyber Indefinite Delivery Indefinite Quantity (IDIQ) contract. The use of multiple-award contractual vehicles will provide a wide range of commercially-available products and services that can meet many requirements related to Unified Platform. These multiple-award contractual vehicles have already met the statutory requirements of the Competition in Contracting Act (CICA); they require a fair opportunity to all contract holders, in accordance with Federal Acquisition Regulation (FAR) 16.505, unless an exception to fair opportunity applies.

Prototyping effort ended in FY21.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0208099F / *Unified Platform (UP)*	Project (Number/Name) 646504 / *AF Prototyping*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Agile Capability Prototyping	Various	Various : Various	-	2.874	Mar 2021	-		-		-		-	0.000	2.874	2.984
		Subtotal	-	2.874		-		-		-		-	0.000	2.874	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	2.874		-		-		-		-	0.000	2.874	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0208099F / *Unified Platform (UP)*	**Project (Number/Name)** 646504 / *AF Prototyping*

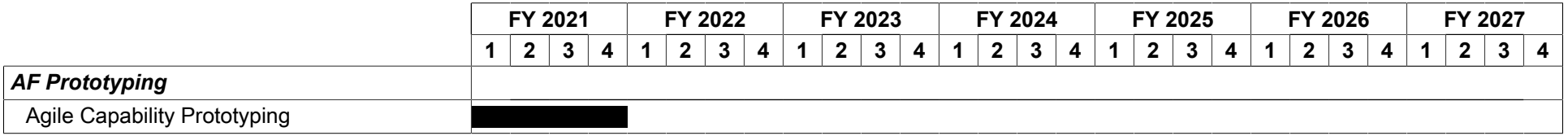

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0208099F / *Unified Platform (UP)*	**Project (Number/Name)** 646504 / *AF Prototyping*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
AF Prototyping				
Agile Capability Prototyping	1	2021	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0208099F / *Unified Platform (UP)*	Project (Number/Name) 646505 / *USCYBERCOM Prototyping*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
646505: *USCYBERCOM Prototyping*	-	2.995	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.995
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2021, Project 646504, AF Prototyping completed.

In FY 2021, Project 646505, USCYBERCOM Prototyping completed.

A. Mission Description and Budget Item Justification

U.S. Cyber Command's (USCYBERCOM) mission is to deter or defeat strategic cyber threats to US interests and infrastructure, provide mission assurance for the operations and defense of the Department of Defense information environment, and support the achievement of Combatant Commander and Joint Force Commander Objectives.

The rapidly evolving cyberspace domain demands highly flexible requirements, acquisition activities, and operations to respond to emerging opportunities or mitigate adversary actions. Salient to this mission area, rapid prototyping activities provide the structure to rapidly develop, evaluate, and integrate new cyber capabilities and inform the initial Unified Platform capability baseline during the early stages of technology maturation and delivery. USCYBERCOM Prototyping efforts support this need through the focus on the rapid and exploratory research, prototype development, risk reduction, testing, and integration of cyber capabilities contributing to early operational development of the Unified Platform capability baseline. USCYBERCOM in conjunction with the Services and National Agencies execute operationally focused research and development and rapid prototyping to explore and determine validity of potential infrastructure, architectures, and capabilities/tools to support Cyber Mission Forces. These rapid prototyping efforts are tailored for near-immediate integration into the Unified Platform baseline (BA 7, PE 0208099F Unified Platform, BPAC 672281F Foundational Efforts) for delivery to cyber warfighters.

Prototyping effort ended in FY21.

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 FY21 0.000M was expended for civilian pay expenses in this program element, and in FY22 0.000M is forecasted for civilian pay expenses in this program element.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: USCYBERCOM Prototyping	2.995	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0208099F / *Unified Platform (UP)*	**Project (Number/Name)** 646505 / *USCYBERCOM Prototyping*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Description: Funding supports USCYBERCOM prototyping efforts associated with the research, development, and integration of cyber technologies supporting the Unified Platform program. ***FY 2022 Plans:*** Prototyping effort ended in FY21 ***FY 2023 Base Plans:*** Prototyping effort ended in FY21 ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A					
Accomplishments/Planned Programs Subtotals	2.995	0.000	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• RDTE 07 0208099F: *Unified Platform (UP)*	84.491	91.893	107.548	-	107.548	0.000	0.000	0.000	-	Continuing	Continuing
• OPAF 03 835080: *AFNET*	0.000	0.000	0.000	-	0.000	0.000	0.000	0.000	-	Continuing	Continuing
• OPAF 03 834320: *C3 Countermeasures*	4.956	4.904	5.013	-	5.013	0.000	0.000	0.000	-	Continuing	Continuing

Remarks

Beginning in FY21 associated OPAF realigned from Line Item 835080 (AFNET) to Line Item 834320 (C3 Countermeasures) for clarity in reporting.

D. Acquisition Strategy

Unified Platform represents a flexible, interoperable, and scalable warfighter capability to be employed by the Army, Navy, Marine Corps, and Air Force in conjunction with U.S. Cyber Command (USCYBERCOM). In order to match the speed of need of the highly dynamic cyberspace domain, the Service-agnostic Unified Platform capability implements an industry standard agile framework to facilitate the rapid development, integration, and fielding of capabilities to remain responsive to evolving warfighter requirements. The Unified Platform program executes the agile development requirements provided by the Army, Navy, Marine Corps, Air Force, and USCYBERCOM stakeholders in accordance with the prioritization provided by the multi-Service Unified Platform governance structure.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0208099F / *Unified Platform (UP)*	**Project (Number/Name)** 646505 / *USCYBERCOM Prototyping*

The initial Unified Platform capability delivers a minimum viable product (MVP) for immediate deployment and operational use by the Cyber Mission Force. Subsequent build iterations continue to deliver enhanced capabilities, incrementally building the Unified Platform capability to match warfighter needs and requirements to achieve cyberspace dominance. Early development of the Unified Platform baseline capability relies on extensive rapid prototyping efforts to analyze integration constraints and opportunities of Service-specific cyber capabilities to realize the Unified Platform MVP and inform the future Unified Platform baseline (BA 4, PE 0208099F Unified Platform, 646504 AF Prototyping and 646505 USCYBERCOM Prototyping). In parallel, an enduring foundational Unified Platform thrust area supports the development and maturation of Unified Platform baseline, integrates successful prototyping activities, and implements an agile development/security/operations (DevSecOps) construct to rapidly evolve and enhance the Unified Platform capability to match warfighter requirements (BA 7, PE 0208099F Unified Platform, 672281 Foundational Efforts).

The Unified Platform program office utilizes Concept, Development, Risk management, Production, or Deployment Plans as part of a streamlined approach to agile acquisition planning. All plans contain sufficient information to inform acquisition decisions (i.e., authorities to proceed), within the agile framework, to determine readiness to enter into the applicable phase of the acquisition process. Unified Platform utilizes both new and existing contractual vehicles, such as Government-Wide Acquisition Contract (GWAC) vehicles (Alliant, Encore II, Solutions for Enterprise-Wide Procurement IV (SEWP IV), and General Services Administration (GSA) Federal Supply Schedules and a new Cyber Indefinite Delivery Indefinite Quantity (IDIQ) contract. The use of multiple-award contractual vehicles will provide a wide range of commercially-available products and services that can meet many requirements related to Unified Platform. These multiple-award contractual vehicles have already met the statutory requirements of the Competition in Contracting Act (CICA); they require a fair opportunity to all contract holders, in accordance with Federal Acquisition Regulation (FAR) 16.505, unless an exception to fair opportunity applies.

Prototyping effort ended in FY21.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0208099F / *Unified Platform (UP)*	Project (Number/Name) 646505 / *USCYBERCOM Prototyping*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Agile Capability Prototyping	Various	Multiple Agencies : Various	-	2.995	Oct 2020	-		-		-		-	0.000	2.995	2.995
		Subtotal	-	2.995		-		-		-		-	0.000	2.995	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	2.995		-		-		-		-	0.000	2.995	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0208099F / *Unified Platform (UP)*	**Project (Number/Name)** 646505 / *USCYBERCOM Prototyping*

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
USCYBERCOM Prototyping																												
Agile Capability Prototyping	[redacted]																											

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0208099F / *Unified Platform (UP)*	**Project (Number/Name)** 646505 / *USCYBERCOM Prototyping*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
USCYBERCOM Prototyping				
Agile Capability Prototyping	1	2021	4	2021

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0304369F / *Cyber Capabilities Support Office (CCSO)*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	19.964	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
646008: *US Cyber Command Technology Development*	-	19.964	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

Mission Description.

The Cyber Capabilities Support Office (CCSO) within the Air Force Concepts, Development, and Management (SAF/CDM) Office is partnered with the New Mexico Institute of Mining and Technology (NMT) to develop the Playas Training and Research Environment (PTRE) at the NMT. This team will: develop a vision and strategy for Multi Domain Operations at the PTRE, facilitate build-out of a research and experimentation environment supporting evaluation and development of Full-Spectrum Multi-Domain Operations from Cyber, Cognitive, Supervisory control and data acquisition (SCADA), to include Terrestrial and airspace through space domains. The development team will also design and develop an "Operator in the Loop" research methodology enabling researchers to evaluate research hypotheses via access to operational platforms to simultaneously conduct integrated training and exercise events. Additionally, the team will establish and re-engineer business processes and usher programs/projects from conceptualization through transition to operational and Service components. Detachment (Det) 1, HQ 55th Wing (WG) provides Information Warfare integration and organizational oversight for operations, training, and infrastructure build-up of PTRE.

Budget Item Justification

The NMT in conjunction with the Cyber Capabilities Support Office, and Det 1 HQ 55th Wing is developing an environment at the Playas Training and Research Environment (PTRE) to advance DoD Information Dominance capabilities and effectiveness in support of the National Defense Strategy by replicating a multi-domain, information warfare combat environment for simultaneous operations, cyber enabled kinetic operations, or physically enabled cyber operations, while reducing the research-to-operational fielding timeline.

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 0304369F. In PY $0.0448 M was expended for civilian pay expenses in this program element, and in CY $0.1796 M is forecasted for civilian pay expenses in this program element

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0304369F / *Cyber Capabilities Support Office (CCSO)*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	19.964	0.000	0.000	0.000	0.000
Total Adjustments	19.964	0.000	0.000	0.000	0.000
• Congressional General Reductions	-0.036	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	20.000	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

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Project: 646008: *US Cyber Command Technology Development*		
Congressional Add: *U Cyber Command Technology Development*	19.964	0.000
Congressional Add Subtotals for Project: 646008	19.964	0.000
Congressional Add Totals for all Projects	19.964	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0304369F / *Cyber Capabilities Support Office (CCSO)*	Project (Number/Name) 646008 / *US Cyber Command Technology Development*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
646008: *US Cyber Command Technology Development*	-	19.964	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

Mission Description.
The Cyber Capabilities Support Office (CCSO) within the Air Force Concepts, Development, and Management (SAF/CDM) Office is partnered with the New Mexico Institute of Mining and Technology (NMT) to develop the Playas Training and Research Environment (PTRE) at the NMT. This team will: develop a vision and strategy for Multi Domain Operations at the PTRE, facilitate build-out of a research and experimentation environment supporting evaluation and development of Full-Spectrum Multi-Domain Operations from Cyber, Cognitive, Supervisory control and data acquisition (SCADA), to include Terrestrial and airspace through space domains. The development team will also design and develop an "Operator in the Loop" research methodology enabling researchers to evaluate research hypotheses via access to operational platforms to simultaneously conduct integrated training and exercise events. Additionally, the team will establish and re-engineer business processes and usher programs/projects from conceptualization through transition to operational and Service components. Detachment (Det) 1, HQ 55th Wing (WG) provides Information Warfare integration and organizational oversight for operations, training, and infrastructure build-up of PTRE.

Budget Item Justification
The NMT in conjunction with the Cyber Capabilities Support Office, and Det 1 HQ 55th Wing is developing an environment at the Playas Training and Research Environment (PTRE) to advance DoD Information Dominance capabilities and effectiveness in support of the National Defense Strategy by replicating a multi-domain, information warfare combat environment for simultaneous operations, cyber enabled kinetic operations, or physically enabled cyber operations, while reducing the research-to-operational fielding timeline.

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 0304369F. In PY $0.0448 M was expended for civilian pay expenses in this program element, and in CY $0.1796 M is forecasted for civilian pay expenses in this program element

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022
Congressional Add: U Cyber Command Technology Development	19.964	0.000
FY 2021 Accomplishments: Developed a vision and strategy for Multi Domain Operations at the Playas Training and Research Environment (PTRE) - Facilitated the build-out of a research and experimentation environment that supports evaluation and development of Full-Spectrum Multi-Domain Operations, from Cyber, Cognitive, Supervisory control and data acquisition (SCADA), Terrestrial, Airspace through Space domains		

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0304369F / *Cyber Capabilities Support Office (CCSO)*	**Project (Number/Name)** 646008 / *US Cyber Command Technology Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022
- Developing an "Operator in the Loop" research methodology that enables researchers to evaluate research hypotheses utilizing access to operational platforms to simultaneously develop and conduct integrated training and exercise events - Establishing and re-engineering business processes, ushering programs/projects from conceptualization through transition to operational and Service components ***FY 2022 Plans:*** N/A		
Congressional Adds Subtotals	19.964	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Cyber Capabilities Support Office utilizes a tailorable acquisition strategy that facilitates rapid delivery of material and non-material solutions to solve operational Offensive Cyber Operations requirements. This approach allows flexibility for solutions to enter the acquisitions process at any phase of the acquisition life cycle. All plans contain sufficient information for the Milestone Decision Authority to determine readiness to enter into the applicable phase of the acquisition process. CCSO, in conjunction with the Air Force Research Lab (AFRL) and the New Mexico Institute of Mining and Technology (NMT), provides the direction, equipment, research and development, developmental testing, operational test and evaluation, necessary facilities, legal and associated costs supporting cyber innovation leveraging cyber kinetic combat environment funding. In FY21 funds primarily utilize the Playas Electronic Attack & Cyber Environment (PEACE) contract held by AFRL. The PEACE contract provides acquisition of the infrastructure, material and services necessary to implement the strategic vision and assist in the transition of operations to ACC in FY23. In addition, GSA contracts will provide MAJCOM Liaison, SME Program Management Support and SME SETA support.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0304369F / *Cyber Capabilities Support Office (CCSO)*	**Project (Number/Name)** 646008 / *US Cyber Command Technology Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Develop vision and strategy; build-out of a research and experimentation environment; Develop "Operator in the Loop research methodology; Establish and re-engineer business processes	SS/ Various	New Mexico Tech: : NM	-	16.309	Apr 2021	-		-		-		-	0.000	16.309	16,877.000
		Subtotal	-	16.309		-		-		-		-	0.000	16.309	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Air Combat Command Liaison ,Subject Matter Expert Program Support - Smartronix 47QFCA19F0003	C/CPAF	Smartronic : California, MD	-	1.877	May 2021	-		-		-		-	0.000	1.877	1,877.000
Systems Engineering and Technical Assistance (SETA) Support - GSA Noblis 47QFNA19F0075	SS/CPAF	Noblis : Reston, VA	-	0.370	Sep 2021	-		-		-		-	0.000	0.370	0.370
Information Warfare integration and organizational oversight for operations, training, and infrastructure build-up the PTRE - Detachment (Det) 1, HQ 55th Wing (WG	MIPR	USAF 55 Wing : Offutt, NE	-	0.250	Jun 2022	-		-		-		-	0.000	0.250	0.250
Intergovernmental Personnel Act (IPA) support from UMD Applied Research Laboratory for	SS/FP	UMD ARLIS : Baltimore, MD	-	0.318	Jun 2021	-		-		-		-	0.000	0.318	0.318

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0304369F / *Cyber Capabilities Support Office (CCSO)*	**Project (Number/Name)** 646008 / *US Cyber Command Technology Development*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Intelligence and Security (ARLIS) to SAF/CDM for Playas Training and Research Environment (PTRA)															
Gov Civilian Pay	SS/FP	US Gov Civilian : Washington, DC	-	0.400	May 2021	-		-		-		-	0.000	0.400	0.400
		Subtotal	-	3.215		-		-		-		-	0.000	3.215	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contract Management: Playas Mission Effects Analysis for Multi-domain Sensing (MEAMS)	SS/FP	Infoscitex Corporation : Dayton, OH	-	0.440	May 2021	-		-		-		-	0.000	0.440	0.044
		Subtotal	-	0.440		-		-		-		-	0.000	0.440	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	19.964		-		-		-		-	0.000	19.964	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0304369F / *Cyber Capabilities Support Office (CCSO)*	**Project (Number/Name)** 646008 / *US Cyber Command Technology Development*

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
Cyber Kinetic Combat Environment																												
Develop a vision and strategy for Multi Domain Operations at the Playas Training and Research Environment (PTRE)			[redacted]																									
Facilitate the build-out of a research and experimentation environment			[redacted]																									
Develop an "Operator in the Loop research methodology			[redacted]																									
Establishing and re-engineering business processes			[redacted]																									

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0304369F / *Cyber Capabilities Support Office (CCSO)*	**Project (Number/Name)** 646008 / *US Cyber Command Technology Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Cyber Kinetic Combat Environment				
Develop a vision and strategy for Multi Domain Operations at the Playas Training and Research Environment (PTRE)	3	2021	4	2022
Facilitate the build-out of a research and experimentation environment	3	2021	4	2022
Develop an "Operator in the Loop research methodology	3	2021	4	2022
Establishing and re-engineering business processes	3	2021	4	2022

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0305236F / *Common Data Link Executive Agent (CDL EA)*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	39.221	43.881	37.460	0.000	37.460	32.487	33.095	33.791	34.543	Continuing	Continuing
641334: *Common Data Link (CDL)*	-	39.221	43.881	37.460	0.000	37.460	32.487	33.095	33.791	34.543	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Common Data Link Executive Agent (CDL EA) provides the DoD standard for interoperable, multi-service, multi-agency, Intelligence, Surveillance, and Reconnaissance (ISR) datalinks for 15,000 DoD manned/unmanned airborne and ground terminals. As the DoD CDL EA, the Air Force is responsible for cross-service application of CDL RDT&E Military Intelligence Program (MIP) funds facilitating compliance to DoD mandates. The CDL EA develops, modifies, distributes, and maintains specifications for the CDL waveform family; ensuring design configuration control, commonality, and interoperability among ISR platforms. Additionally, funds support managing resources allocated for development, maturation, and migration of CDL technologies.

CDL EA enables compliance with OSD mandates to effectively utilize spectrum, use approved cryptographic equipment, and provide direct support to current operations. CDL is a vital link in DoD's existing and emerging communication architectures, providing flexibility to accommodate Command and Control (C2) data and myriad types of Signals Intelligence (SIGINT), Geospatial Intelligence (GEOINT), and Full-Motion Video (FMV) data. The CDL specifications permit current and future ISR asset operations worldwide by providing sensor data directly via point-to-point and air-to-air or compatible satellite broadcast links to ground sites, airborne platforms, and dismounted users to support Joint All-Domain Command and Control (JADC2) warfare.

CDL EA's research and development activities support a broad array of tactical (including tactical data links (TDL) and high capacity backbone (HCB)), operational, and strategic ISR users. High priority investment activities support and include: achieving higher data rates, open architecture development, multi-access and multi-node network management, cryptographic modernization, advancements needed to operate in contested environments, terminal and antenna design enhancements, operations in other spectral bands for spectrum efficiency. Activities also include studies and analysis to support current and future requirements documentation, program planning and execution. CDL prototype terminal designs provide for future technology insertion and reduce non-recurring engineering and life-cycle costs to the user.

In addition, the Cryptographic Core Modernization (CCM) thrust enables CDL to develop a miniaturized gigabit rate cybersecurity devices capable of securing CDL data through improving Transportation Security (TRANSEC) capabilities. The miniaturized Cybersecurity device will allow faster throughput while reducing Size, Weight, and Power (SWaP) requirements.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver weapon system capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program element 0605827F, 0605828F, 0605829F, 0605831F, 0605832F, 0605833F, 0605898F,

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0305236F / *Common Data Link Executive Agent (CDL EA)*

0606398F. In FY21 $0.450M was expended for civilian pay expenses in this program element, and in FY22 $0.338M is forecasted for civilian pay expenses in this program element.

The FY2023 funding request was reduced by $7.01 million to account for the availability of prior year execution balances.

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

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	39.221	43.881	0.000	0.000	0.000
Current President's Budget	39.221	43.881	37.460	0.000	37.460
Total Adjustments	0.000	0.000	37.460	0.000	37.460
• 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	37.460	0.000	37.460

Change Summary Explanation

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Common Data Link (CDL) Technology Advancement	11.303	19.100	14.062
Description: CDL evolutionary concept development, exploratory prototyping, advanced technology demonstrations, and studies of emerging technologies and capability gaps.			
FY 2022 Plans: - Continue to research and evaluate technology developments for enhancing the CDL enterprise networking architecture, to include network management devices, applications and advanced algorithms. - Continue to research, evaluate and develop more spectrally efficient waveforms to support Combatant Command demand for higher bandwidth transmission and improved jam resistant capabilities.			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0305236F / *Common Data Link Executive Agent (CDL EA)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
- Continue to research, evaluate and develop improvements to CDL waveforms to lower probability of detection and interception to support Combatant Command demand for improved covertness of ground and airborne forces. - Continue development of enhanced, CDL-based Intelligence, Surveillance and Reconnaissance (ISR) communication capabilities across multiple platforms and echelons among U.S and allied partners. - Continue development of a collaborative CDL modeling and simulation environment using Navy Research Lab's Extendable Mobile Ad-Hoc Network Emulator (EMANE) framework for CDL performance analysis and waveform advancements. The CDL EMANE environment will be the baseline for joint Service and vendor collaboration as the community modernizes CDL for the future fight. - Continue waveform performance analysis of current CDL capabilities and future enhancements on their ability to achieve mission success in National Defense Strategy (NDS) derived scenarios to focus future CDL modernization efforts to update the CDL specifications. - Continue analysis and study of multi-beam antenna technology to further improve CDL networking and Low Probability of Interception / Low Probability of Detection / Anti-Jam (LPI/LPD/AJ) capabilities in future contested battlespace. - Continue antenna array modernization with the Extremely Wideband Operations (EWO) antenna array research and development. - Continue to research, evaluate and develop an Open Systems Architecture to improve CDL enterprise interoperability and terminal design flexibility. - Continue prototyping and advanced technology demonstrations in support of emerging communication backbone architecture, including high capacity backbone (HCB) development, across multi-domains. - Continue requirements and design improvements for more robust BE-CDL support to smaller Group 1 UAV. - Continue exploratory prototyping efforts and advanced technology demonstrations in support of emerging communication backbone architecture, including HCB development, across air, space and terrestrial layers, to include agile high capacity data transport, assured communications and multi-mode access network. - Continue research and evaluate developing Artificial Intelligence (AI) technologies to support faster correlation and fusion of ISR and CDL network management processes. - Continue to research and evaluate developing technologies to minimize the National Security Agency (NSA) required certification requirements for terminals while standardizing Communications Security (COMSEC) and Transmission Security (TRANSEC) implementation.			
FY 2023 Plans: - Will continue to research and evaluate technology developments for enhancing the CDL enterprise networking architecture, to include network management devices, applications and advanced algorithms. - Will continue to research, evaluate and develop more spectrally efficient waveforms to support Combatant Command demand for higher bandwidth transmission and improved jam resistant capabilities.			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0305236F / *Common Data Link Executive Agent (CDL EA)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
- Will continue to research, evaluate and develop improvements to CDL waveforms to lower probability of detection and interception to support Combatant Command demand for improved covertness of ground and airborne forces. - Will continue development of enhanced, CDL-based Intelligence, Surveillance and Reconnaissance (ISR) communication capabilities across multiple platforms and echelons among U.S and allied partners. - Will continue development of a collaborative CDL modeling and simulation environment using Navy Research Lab's Extendable Mobile Ad-Hoc Network Emulator (EMANE) framework for CDL performance analysis and waveform advancements. The CDL EMANE environment will be the baseline for joint Service and vendor collaboration as the community modernizes CDL for the future fight. - Will continue waveform performance analysis of current CDL capabilities and future enhancements on their ability to achieve mission success in National Defense Strategy (NDS) derived scenarios to focus future CDL modernization efforts to update the CDL specifications. - Will continue analysis and study of multi-beam antenna technology to further improve CDL networking and Low Probability of Interception / Low Probability of Detection / Anti-Jam (LPI/LPD/AJ) capabilities in future contested battlespace. - Will continue antenna array modernization with the Extremely Wideband Operations (EWO) antenna array research and development. - Will continue to research, evaluate and develop an Open Systems Architecture to improve CDL enterprise interoperability and terminal design flexibility. - Will continue prototyping and advanced technology demonstrations in support of emerging communication backbone architecture, including high capacity backbone (HCB) development, across multi-domains. - Will continue requirements and design improvements for more robust BE-CDL support to smaller Group 1 UAV. - Will continue exploratory prototyping efforts and advanced technology demonstrations in support of emerging communication backbone architecture, including HCB development, across air, space and terrestrial layers, to include agile high capacity data transport, assured communications and multi-mode access network. - Will continue research and evaluate developing Artificial Intelligence (AI) technologies to support faster correlation and fusion of ISR and CDL network management processes. - Will continue to research and evaluate developing technologies to minimize the National Security Agency (NSA) required certification requirements for terminals while standardizing Communications Security (COMSEC) and Transmission Security (TRANSEC) implementation. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease in technology advancement funding relates to transfer of funds to test and evaluation funding to prepare for formal publication of updated CDL Specification advancements in late FY2023.			
Title: Common Data Link (CDL) Specification Development, Validation, Test and Maintenance	20.318	15.000	15.298

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0305236F / *Common Data Link Executive Agent (CDL EA)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Description: Systems engineering lifecycle for CDL and NATO STANAG 7085 specification development: requirement decomposition, specification development (modeling, maturation, documentation), specification validation (and associated component prototyping), testing, configuration management, and process maintenance. ***FY 2022 Plans:*** - Continue development of vendor and government owner reference implementation of the new LPI/LPD/AJ waveform to perform future test and validation to ensure the CDL specification is accurate and can be built by multiple vendors in the future, therefore keeping the market space open. - Continue evaluation, analysis and study of network management devices, network and waveform configuration tool development; transition improved technologies into CDL Specification baseline that increases data sharing across Service-specific networks. - Continue validation of Bandwidth Efficient CDL's (BE-CDL) new Direct Sequence Spread Spectrum (DSSS) capability that improves CDL data transmissions rates at lower power levels. - Continue development and advancement of dynamical control algorithms to enable terminals to more efficiently use CDL spectrum. This work is also to validate the CDL Common Control Interface. - Continue to work with CDL industry partners and DoD Services and Agencies to document, validate, test and implement common terminal control interfaces through use of commercially recognized standards. - Continue configuration control of the CDL architecture, standards, specifications and reference artifacts to support open interoperability and open competition. - Continue development of CDL test equipment capable of compliance testing to the latest, validated version of CDL specifications. ***FY 2023 Plans:*** - Will continue development of vendor and government owner reference implementation of the new LPI/LPD/AJ waveform to perform future test and validation to ensure the CDL specification is accurate and can be built by multiple vendors in the future, therefore keeping the market space open. - Will continue evaluation, analysis and study of network management devices, network and waveform configuration tool development; transition improved technologies into CDL Specification baseline that increases data sharing across Service-specific networks. - Will complete validation of Bandwidth Efficient CDL's (BE-CDL) Direct Sequence Spread Spectrum (DSSS) capability that improves CDL data transmissions rates at lower power levels. - Will continue development and advancement of dynamical control algorithms to enable terminals to more efficiently use CDL spectrum. This work is also to validate the CDL Common Control Interface.			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0305236F / *Common Data Link Executive Agent (CDL EA)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
- Will continue to work with CDL industry partners and DoD Services and Agencies to document, validate, and test common terminal control interfaces through use of commercially recognized standards. - Will continue configuration control of the CDL architecture, standards, specifications and reference artifacts to support open interoperability and open competition. - Will continue development of CDL test equipment capable of compliance testing to the latest, validated version of CDL specifications. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Additional funds will be utilized for final test and evaluation activities of new CDL advancements in preparation for formal publication of updated CDL Specifications in late FY2023.			
Title: Common Data Link (CDL) Cryptographic Modernization	7.600	9.781	8.100
Description: Phased development effort to modernize CDL Communications Security (COMSEC) and Transmission Security (TRANSEC) devices and standards to maximize performance and reduce Size Weight and Power (SWaP) requirements while supporting interoperability, commonality, modularity, portability, remote management, multi-level security and release to Allied and Coalition partners. ***FY 2022 Plans:*** - Continue to research and evaluate developing technologies to minimize the National Security Agency (NSA) required certification requirements for terminals while standardizing Communications Security (COMSEC) implementation. - Continue to incorporate data Transmission Security (TRANSEC) support, data handling capabilities, and new cryptographic algorithms into all cryptographic core form factors (i.e., Nano, Mini and Mega). - Continue to upgrade Nano and Mini crypto cores with customer requested Engineering Change Proposals (ECP) and complete Security Validation Testing (SVT) and subsequent National Security Agency (NSA) Cyber Security Certification. - Continue to ensure CDL family of waveforms meet developing Transmission Security (TRANSEC) requirements as outlined by the Office of Secretary of Defense Chief Information Officer (DoD CIO). - Continue development, prototyping, and First Implementer integration testing of multi-channel, gigabit data rate (Mega) cryptographic cores. - Continue to conduct an Analysis of Alternatives to identify and develop a Type 1 cryptographic solution for Group 1 Unmanned Aerial Vehicles (UAVs) that provides algorithmic interoperability for Full Motion Video (FMV) datalinks with existing manned and unmanned ISR platforms and ground stations using CCM cryptography. - Continue development and design of common End Cryptographic Units (ECUs) for use with medium- and large-sized ISR terminals. - Continue development of a reference ECU using the Mega CCM crypto core for hardware/software and interface documentation validation.			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0305236F / *Common Data Link Executive Agent (CDL EA)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
- Continue advancement of standardized CCM interface specifications for modularity to ease future systems upgrades, facilitate competitive terminal procurements, promote innovation, and maintain backward compatibility with existing Intelligence, Surveillance and Reconnaissance (ISR) systems. - Continue development, advancement and instantiation of CCM algorithms to support FIVE EYE (FVEY), North Atlantic Treaty Organization (NATO), and Coalition operations for secure encrypted and interoperable ISR data exchange among allied and partner nations. - Continue participating in FVEY, NATO and Coalition forums, testing venues and exercises (including live-fly) to ensure secure encrypted and interoperable ISR data exchange among allied and partner nations.			
FY 2023 Plans: - Will continue to research and evaluate developing technologies to minimize the National Security Agency (NSA) required certification requirements for terminals while standardizing Communications Security (COMSEC) implementation. - Will continue incorporating data Transmission Security (TRANSEC) support, data handling capabilities, and new cryptographic algorithms into all cryptographic core form factors (i.e., Nano, Mini and Mega). - Will continue to upgrade Nano and Mini crypto cores with customer requested Engineering Change Proposals (ECP) and complete Security Validation Testing (SVT) and subsequent National Security Agency (NSA) Cyber Security Certification. - Will continue to ensure CDL family of waveforms meet developing Transmission Security (TRANSEC) requirements as outlined by the Office of Secretary of Defense Chief Information Officer (DoD CIO). - Will continue development, prototyping, and First Implementer integration testing of multi-channel, gigabit data rate (Mega) cryptographic cores. - Will continue to conduct an Analysis of Alternatives to identify and develop a Type 1 cryptographic solution for Group 1 Unmanned Aerial Vehicles (UAVs) that provides algorithmic interoperability for Full Motion Video (FMV) datalinks with existing manned and unmanned ISR platforms and ground stations using CCM cryptography. - Will continue development and design of common End Cryptographic Units (ECUs) for use with medium- and large-sized ISR terminals. - Will continue development of a reference ECU using the Mega CCM crypto core for hardware/software and interface documentation validation. - Will continue the advancement of standardized CCM interface specifications for modularity to ease future systems upgrades, facilitate competitive terminal procurements, promote innovation, and maintain backward compatibility with existing Intelligence, Surveillance and Reconnaissance (ISR) systems. - Will continue development, advancement and instantiation of CCM algorithms to support FIVE EYE (FVEY), North Atlantic Treaty Organization (NATO), and Coalition operations for secure encrypted and interoperable ISR data exchange among allied and partner nations.			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0305236F / *Common Data Link Executive Agent (CDL EA)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
- Will continue participating in FVEY, NATO and Coalition forums, testing venues and exercises (including live-fly) to ensure secure encrypted and interoperable ISR data exchange among allied and partner nations. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease in funding due to completion of baseline development and production of Nano, Mini and Mega core processors. Future funding focused on maintaining and advancing Nano, Mini and Mega core capabilities and reducing SWaP for possible support to Group 1 assets.			
Accomplishments/Planned Programs Subtotals	39.221	43.881	37.460

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

The Air Force serves as the DoD Common Data Link Executive Agent, with support from each Service's designated CDL lead and AFLCMC/HNA (Airborne Network Division). The CDL EA develops interoperable ISR data links mandated for use by DoD CIO policy. Once CDL technology development matures and a specification is published, services are responsible for CDL compliant platform and terminal procurement; National Security Agency (NSA) and Joint Interoperability Test Command (JITC) ensure compliance certifications; integration; and installation. Acquisition strategy varies by contract. Whenever possible, contracts are awarded under full and open competition.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0305236F / *Common Data Link Executive Agent (CDL EA)*	**Project (Number/Name)** 641334 / *Common Data Link (CDL)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Cryptographic Modernization	MIPR	NSA : Ft Meade, MD	-	7.600	Jun 2021	8.100	Dec 2021	8.100		-		8.100	Continuing	Continuing	-
Generic ECU	C/Various	MIT/LL : San Antonio, TX	-	1.300	Dec 2020	-		-		-		-	Continuing	Continuing	-
CDL Network Modernization	MIPR	Air Force and Navy : Various	-	3.905	Oct 2020	4.750	Apr 2022	4.216		-		4.216	Continuing	Continuing	-
A2AD Waveform Advancement	C/CPAF	Army : Various	-	4.100	Apr 2021	2.500	Apr 2022	2.500		-		2.500	Continuing	Continuing	-
CDL Multi Beam Survey and Demonstration	C/Various	Navy : Various	-	1.275	Jun 2021	-		-		-		-	Continuing	Continuing	-
CDL Cognitive Radio Networking Element (CRNE)	C/Various	Navy : Various	-	0.225	Oct 2020	1.330	Feb 2022	0.500		-		0.500	Continuing	Continuing	-
CDL Resource Management and Bridging Network	C/CPAF	Navy : Various	-	1.100	Oct 2020	-		-		-		-	Continuing	Continuing	-
CDL Performance Analysis	SS/FP	JHU/APL : Various	-	1.000	Oct 2020	-		-		-		-	Continuing	Continuing	-
CDL Life Cycle Cost Analysis	C/CPAF	Various : Various	-	0.250	Dec 2020	-		-		-		-	Continuing	Continuing	-
Flexible Ku-Band Adaptive Coding and Group 1/2 UAV CDL and Cryptographic SWaP	C/CPAF	Marine Corps : Various	-	-		2.100	Jan 2022	1.100		-		1.100	Continuing	Continuing	-
Pseudorandom Noise (PM) Code Generation	C/CPAF	Air Force : Various	-	-		0.700	Jan 2022	0.700		-		0.700	Continuing	Continuing	-
CDL Network Control Application	C/CPAF	Air Force : TBD	-	-		1.950	Feb 2022	1.950		-		1.950	Continuing	Continuing	-
Open Systems Architecture Framework	C/CPAF	Navy : Various	-	-		1.000	Jan 2022	0.500		-		0.500	Continuing	Continuing	-
Antenna Array Modernization	C/CPAF	Various : Various	-	-		1.500	Oct 2021	1.500		-		1.500	Continuing	Continuing	-
Over the Air Parameter Administration	C/CPAF	Various : Various	-	-		1.000	Jan 2022	0.250		-		0.250	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0305236F / *Common Data Link Executive Agent (CDL EA)*	**Project (Number/Name)** 641334 / *Common Data Link (CDL)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	20.755		24.930		21.316		-		21.316	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Service Tech Support & Spec Development	MIPR	Various : Various	-	4.194	Dec 2020	4.200	Dec 2021	3.000		-		3.000	Continuing	Continuing	-
Joint Staff CDL Requirements Support	MIPR	Joint Staff - J6 : Arlington, VA	-	0.225	Oct 2020	-		0.225		-		0.225	Continuing	Continuing	-
NATO STANAG 7085 Support	MIPR	Air Force : Various	-	0.225	Oct 2020	0.500	Feb 2022	0.500		-		0.500	Continuing	Continuing	-
Fielded Terminals Database	C/CPFF	Booz Allen : McLean, VA	-	0.750	Feb 2021	0.800	Jan 2022	0.500		-		0.500	Continuing	Continuing	-
		Subtotal	-	5.394		5.500		4.225		-		4.225	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Joint Interoperability Test Command Support	Various	Not specified. : TBD	-	0.800	Feb 2021	0.800	Feb 2022	0.800		-		0.800	Continuing	Continuing	-
CDL Exercise Support	MIPR	Various : Various	-	0.500	Dec 2020	0.500	Apr 2022	0.500		-		0.500	Continuing	Continuing	-
CDL Mode 303/304 Security Validation	C/CPAF	Various : Various	-	-		1.200	Feb 2022	1.200		-		1.200	Continuing	Continuing	-
Compliance Test Tool	C/CPAF	Various : Various	-	2.600	Nov 2020	1.500	Feb 2022	1.000		-		1.000	Continuing	Continuing	-
Cyber Security Initiative	C/CPAF	Navy : San Diego, CA	-	-		0.650	Jan 2022	0.650		-		0.650	Continuing	Continuing	-
		Subtotal	-	3.900		4.650		4.150		-		4.150	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0305236F / *Common Data Link Executive Agent (CDL EA)*	**Project (Number/Name)** 641334 / *Common Data Link (CDL)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MITRE Engineering Direct Mission Support (FFRDC)	SS/CPFF	MITRE Corp. : Bedford, MA	-	5.750	Oct 2020	5.800	Oct 2021	5.300		-		5.300	Continuing	Continuing	-
PMO Support - AFLCMC (HNAG)	C/CPFF	Various : Various, MA	-	3.422	Nov 2020	3.001	Feb 2022	2.469		-		2.469	Continuing	Continuing	-
		Subtotal	-	9.172		8.801		7.769		-		7.769	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	39.221		43.881		37.460		-		37.460	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0305236F / *Common Data Link Executive Agent (CDL EA)*	**Project (Number/Name)** 641334 / *Common Data Link (CDL)*

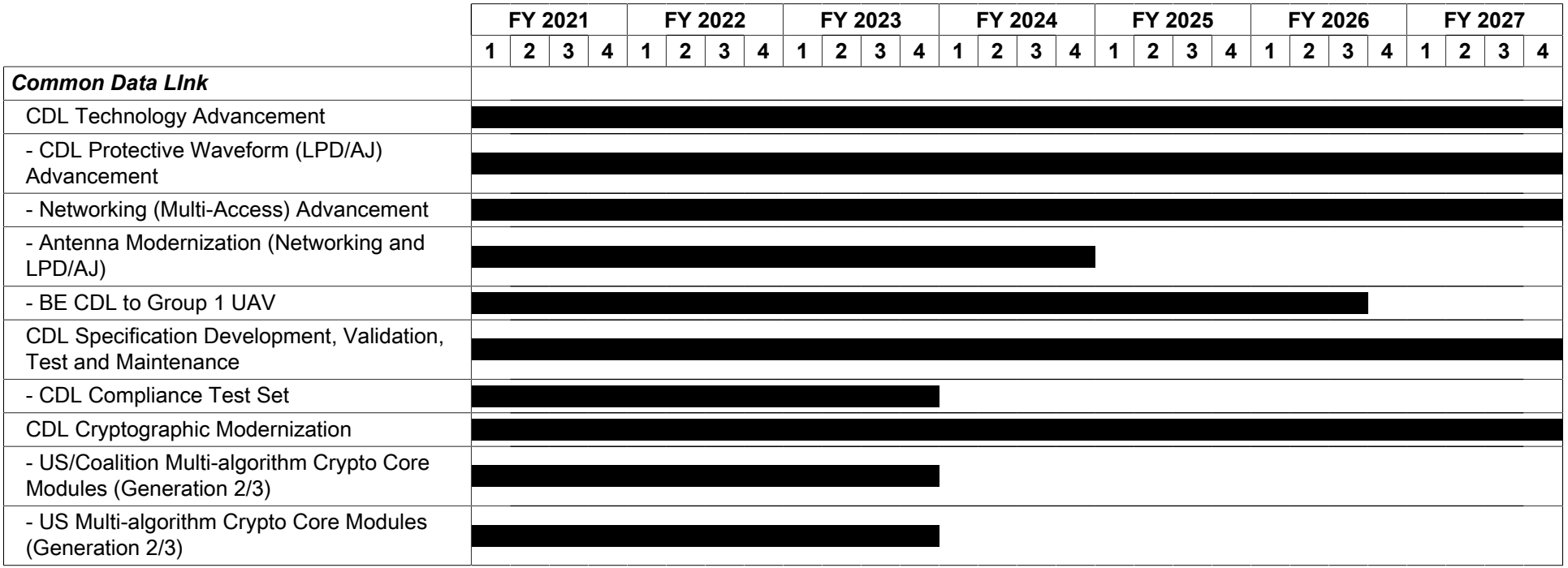

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0305236F / *Common Data Link Executive Agent (CDL EA)*	**Project (Number/Name)** 641334 / *Common Data Link (CDL)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Common Data LInk				
CDL Technology Advancement	1	2021	4	2027
- CDL Protective Waveform (LPD/AJ) Advancement	1	2021	4	2027
- Networking (Multi-Access) Advancement	1	2021	4	2027
- Antenna Modernization (Networking and LPD/AJ)	1	2021	4	2024
- BE CDL to Group 1 UAV	1	2021	3	2026
CDL Specification Development, Validation, Test and Maintenance	1	2021	4	2027
- CDL Compliance Test Set	1	2021	4	2023
CDL Cryptographic Modernization	1	2021	4	2027
- US/Coalition Multi-algorithm Crypto Core Modules (Generation 2/3)	1	2021	4	2023
- US Multi-algorithm Crypto Core Modules (Generation 2/3)	1	2021	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0305601F / *Mission Partner Environments*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	10.991	16.420	17.378	0.000	17.378	17.727	16.756	17.109	17.490	Continuing	Continuing
643783: *CENTRIXs Networks*	-	10.991	16.420	17.378	0.000	17.378	17.727	16.756	17.109	17.490	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Mission Partner Environment (MPE) enables secure sharing of operational information for collaboration between and among the U.S. and mission partners to include federal, State, local, and tribal agencies, allies, coalition members, host nations, and other nations, United States (US) and international Non-Governmental Organizations, multinational treaty organizations, and private sector organizations. The MPE program enables the United States (US) Department of Defense (DoD) to execute its assigned missions with mission partners across all ranges and phases of military operations to enable combined command and control (C2) of coalition forces while promoting effective exchange of C2 and intelligence information to enable effective use of the US and partner nation military power. MPE improves survivability and lethality of US Forces.

DoD Directive 5101.22E, effective August 5, 2020, designated the Secretary of the Air Force as Executive Agent (EA) for the DoD Mission Partner environment. The EA, through the Mission Partner Capabilities Office provides DoD wide enterprise-level development, integration, systems engineering, architecture, and synchronized delivery of mission capabilities to include DoD-wide enterprise services that support joint and multinational warfighting functional information sharing. Additionally, the EA executes enterprise-level MPE Planning Programming Budgeting and Execution (PPBE) activities to coordinate the development of MPE budget requirements and provide recommendations to OSD Principle Staff Assistants for PPBE guidance and to the DoD Component heads for performance guidance. The EA also documents the DoD MPE to provide a comprehensive understanding that informs future technical solutions. The FY2023 funding continues the development, integration, and testing of an enterprise architectural engineering solution in alignment with the federated mission networking framework to combine multiple coalition information sharing capabilities into a single Mission Partner Environment, to include modifications necessary to absorb legacy systems capabilities and capacities. In addition, this funding further supports Coalition Interoperability Assurance and Validation (CIAV) technical, analytical, and engineering support to resolve C2 interoperability challenges and evaluate existing and emerging cyber capabilities in support of the MPE ecosystem.

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 $0.00M was expended for civilian pay expenses in this program element, and in CY $0.00M is forecasted for civilian pay expenses in this program element.

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0305601F / *Mission Partner Environments*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	11.409	16.420	0.000	0.000	0.000
Current President's Budget	10.991	16.420	17.378	0.000	17.378
Total Adjustments	-0.418	0.000	17.378	0.000	17.378
• 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	-0.418	0.000	17.378	0.000	17.378

Change Summary Explanation

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budge positions for FY 2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Mission Partner Environment	10.991	16.420	17.378	0.000	17.378
Description: Mission Partner Environment (MPE) enables secure sharing of operational information for collaboration between and among the United States (US) and mission partners to include federal, state, local, and tribal agencies, allies, coalition members, host nations, and other nations, US and international Non-Governmental Organizations, multinational treaty organizations, and private sector organizations.					
FY 2022 Plans: Continue development, integration, and testing of core C2 mission capabilities with increased capacities and integration into the cross national, cross organizational, and cross domain accreditation for C2 mission capabilities, and continuity of operations for enterprise services. Continue development, integration, and testing of an enterprise architectural engineering solution to combine multiple coalition information sharing capabilities into a single Mission Partner Environment, to include modifications necessary to absorb legacy systems capabilities and capacities.					
FY 2023 Base Plans:					

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0305601F / *Mission Partner Environments*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Continue development, integration, and testing of an enterprise architectural engineering solution in alignment with the federated mission networking framework to combine multiple coalition information sharing capabilities into a single Mission Partner Environment, to include modifications necessary to absorb legacy systems capabilities and capacities. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increase to meet user requirements to develop and field evolving mission sets.					
Accomplishments/Planned Programs Subtotals	10.991	16.420	17.378	0.000	17.378

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• O&M BA 01 PE 0305601F: *Mission Partner Environment*	110.701	133.340	153.289	-	153.289	155.687	148.821	151.744	154.544	Continuing	Continuing
• OPAF 03 834010: *General Information Technology*	0.478	32.083	14.887	-	14.887	10.504	2.041	2.099	2.140	Continuing	Continuing

Remarks

N/A

E. Acquisition Strategy

Performance-based contracts are primarily used for this support. MPE maximizes the use of competitive awards and uses various contract types, employs large and small contractors, and is focused to achieve agency socio-economic goals and incorporate DoD acquisition reform initiatives.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0305601F / *Mission Partner Environments*	Project (Number/Name) 643783 / *CENTRIXs Networks*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Cross Domain Solution Ops Capabiliites	C/FFP	MITRE Corporaton : McLean, VA	-	10.991	Mar 2021	16.420	Mar 2022	17.378	Mar 2023	-		17.378	Continuing	Continuing	-
		Subtotal	-	10.991		16.420		17.378		-		17.378	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	10.991		16.420		17.378		-		17.378	Continuing	Continuing	N/A

Remarks

N/A

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0305601F / *Mission Partner Environments*	**Project (Number/Name)** 643783 / *CENTRIXs Networks*

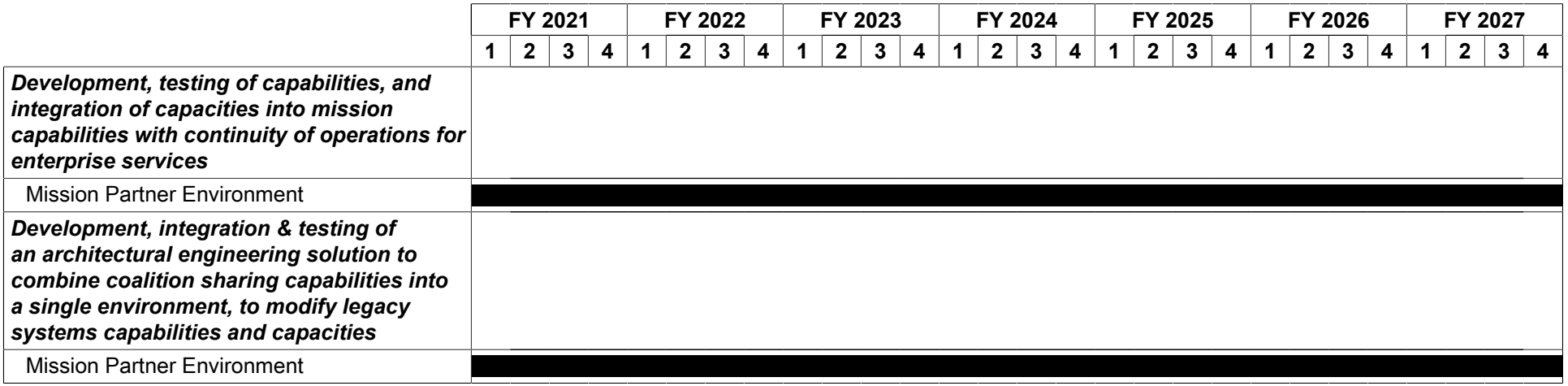

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0305601F / *Mission Partner Environments*	**Project (Number/Name)** 643783 / *CENTRIXs Networks*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Development, testing of capabilities, and integration of capacities into mission capabilities with continuity of operations for enterprise services				
Mission Partner Environment	1	2021	4	2027
Development, integration & testing of an architectural engineering solution to combine coalition sharing capabilities into a single environment, to modify legacy systems capabilities and capacities				
Mission Partner Environment	1	2021	4	2027

Note

N/A

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0306250F / *Cyber Operations Technology Support*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	226.073	282.218	234.576	0.000	234.576	0.000	0.000	0.000	0.000	Continuing	Continuing
646008: *US Cyber Command Technology Development*	-	226.073	282.218	234.576	0.000	234.576	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

US Cyber Command's (USCYBERCOM) mission is to deter or defeat strategic threats to US interests and infrastructure, provide mission assurance for the operations and defense of the Department of Defense information environment, and support the achievement of Joint Force Commander objectives.

USCYBERCOM in conjunction with the Services and National Agencies will develop and expand infrastructure architectures and capabilities/tools to support Cyber Mission Forces (CMF). Focus is on four broad program areas: Joint Common Services, Joint Access Platforms, Joint Weapons, and Joint Sensors.

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 FY21 $0.000M was expended for civilian pay expenses in this program element, and in FY22 $0.000M is forecasted for civilian pay expenses in this program element.

The FY 2023 funding request was reduced by $17.074 million to account for the availability of prior year execution balances.

The specific details and aspects of these cyber activities are classified and will be provided on a need-to-know basis.

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0306250F / *Cyber Operations Technology Support*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	234.395	242.499	0.000	0.000	0.000
Current President's Budget	226.073	282.218	234.576	0.000	234.576
Total Adjustments	-8.322	39.719	234.576	0.000	234.576
• 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	-8.322	0.000			
• Other Adjustments	0.000	39.719	234.576	0.000	234.576

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Project: 646008: *US Cyber Command Technology Development*		
Congressional Add: *Cloud Communications Validation Pilot*	0.000	0.000
Congressional Add Subtotals for Project: 646008	0.000	0.000
Congressional Add Totals for all Projects	0.000	0.000

Change Summary Explanation

The FY 2022 Appropriations Law, Division N--Ukraine Supplemental, Title III added $39.719M to PE 0306250F.

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Joint Common Services	40.201	60.504	60.550
Description: Provides mission/business enabling IT infrastructures, business IT capabilities and life-cycle sustainment; supports internal mission/business operations for USCYBERCOM; and enables JCWA efforts across USCYBERCOM. The origin, details, and specific aspects of these efforts are classified and will be provided on a need-to-know basis.			
FY 2022 Plans:			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0306250F / *Cyber Operations Technology Support*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Continue the development of the JCWA as the common joint capability to enable split-based, offensive and defensive operations. Continue sustainment of cyber operations capabilities in support of the CMF Continue development of USCYBERCOM cross-domain solutions that enable automated data flow from access platform to data repository and enable enrichment of data and reporting across security domains. Continue expansion, sustainment and compliance of fielded capabilities in support of cyber operations. Continue development of technologies, policies, and processes needed to enable Intelligence and "indicator" sharing across the DODIN tiers and domains. Continue to provide enrichment of USCYBERCOM Title 10 data with additional Title 50 sources. Continue to drive standards and interoperability of JCWA. Continue to provide critical support to a developing and maturing Acquisition and Contracting entities and improve the efficiency and effectiveness of program management and acquisition processes.			
FY 2023 Plans: Will continue development of the JCWA as the common joint capability to enable split-based, offensive and defensive operations. Continue sustainment of cyber operations capabilities in support of the CMF. Will continue development of USCYBERCOM cross-domain solutions that enable automated data flow from access platform to data repository and enable enrichment of data and reporting across security domains. Will continue expansion, sustainment and compliance of fielded capabilities in support of cyber operations. Will continue development of technologies, policies, and processes needed to enable Intelligence and "indicator" sharing across the DODIN tiers and domains. Will continue to provide enrichment of USCYBERCOM Title 10 data with additional Title 50 sources. Will continue to drive standards and interoperability of JCWA.			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0306250F / *Cyber Operations Technology Support*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Will continue to provide critical support to a developing and maturing Acquisition and Contracting entities and improve the efficiency and effectiveness of program management and acquisition processes. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increased due to inflationary adjustments.			
Title: Joint Access Platforms ***Description:*** Delivers infrastructures and systems that enable access to networks through traditional and non-traditional means. The origin, details, and specific aspects of these efforts are classified and will be provided on a need-to-know basis. ***FY 2022 Plans:*** Perform a technology refresh and upgrade of the Security Operations Center (SOC) to conduct advanced analytics of on-net operations infrastructure. Continue to develop OpenCPI applications against strategic targets and expand the suite of supported hardware. Continue to scale the deployment of proven access enabling components across strategic target spaces and integrate resulting data feeds into Common Operating Pictures(s). ***FY 2023 Plans:*** Will continue to perform a technology refresh and upgrade of the Security Operations Center (SOC) to conduct advanced analytics of on-net operations infrastructure. Will continue to develop OpenCPI applications against strategic targets and expand the suite of supported hardware. Will continue to scale the deployment of proven access enabling components across strategic target spaces and integrate resulting data feeds into Common Operating Picture(s). ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreased to the program baseline level established prior to inclusion of FY 2022 Appropriations Law supplemental funding for Ukraine.	66.736	68.571	48.328
Title: Joint Weapons ***Description:*** Capabilities that are developed, tested, stored, and employed for cyberspace operations.	99.317	131.577	119.118

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0306250F / *Cyber Operations Technology Support*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
The origin, details, and specific aspects of these efforts are classified and will be provided on a need-to-know basis. ***FY 2022 Plans:*** Continue to enhance and sustain common service exploitation frameworks supporting CMF operations based on evolving operational requirements. Continue the research, development, integration, and procurement of mission-focused exploit capabilities as a common service to support CMF operations. Continue to update Personal Security Protection Testing Services to ensure they support current test needs and facilitate delivered cyber weapons through operational acceptance. Continue to perform Functional Acceptance Testing and deliver fully tested foundational cyber weapons into the Government's Development Evaluation (DE) and Operational Evaluation (OE) processes. Continue to develop and deliver independently-tested foundational tools suites to incrementally achieve a full complement of required capabilities. The foundational tool suites will provide operational agility for CMF cyberspace operations. Continue to measure signatures on each spiral of delivered tools to verify uniqueness of tools and diversity of source code. Continue to develop and deliver specialized tools, exploits, and research to CMF that will enable access to "hard targets." ***FY 2023 Plans:*** Will continue to enhance and sustain common service exploitation frameworks supporting CMF operations based on evolving operational requirements. Will continue the research, development, integration, and procurement of mission-focused exploit capabilities as a common service to support CMF operations. Will continue to update Personal Security Protection Testing Services to ensure they support current test needs and facilitate delivered cyber weapons through operational acceptance. Will continue to perform Functional Acceptance Testing and deliver fully tested foundational cyber weapons into the Government's Development Evaluation (DE) and Operational Evaluation (OE) processes.			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0306250F / *Cyber Operations Technology Support*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Will continue to develop and deliver independently-tested foundational tools suites to incrementally achieve a full complement of required capabilities. The foundational tool suites will provide operational agility for CMF cyberspace operations. Will continue to measure signatures on each spiral of delivered tools to verify uniqueness of tools and diversity of source code. Will continue to develop and deliver specialized tools, exploits, and research to CMF that will enable access to "hard targets." ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreased to the program baseline level established prior to inclusion of FY 2022 Appropriations Law supplemental funding for Ukraine.			
Title: Joint Sensors	19.819	21.566	6.580
Description: Development of capabilities to collect, process, analyze, and share data elements both on- and off-DoDIN environments. Includes both dynamically emplaced capabilities and static, enduring systems and applications. The origin, details and specific aspects of these efforts are classified and will be provided on a need-to-know basis. ***FY 2022 Plans:*** Work towards consolidation of Advanced Frameworks for cyber operations, situational awareness, and risk assessment and mitigation into a multiple-purpose solution in Unified Platform. Incorporate new advanced risk management tool from research labs into risk assessment component of Unified Platform. Leverage new capabilities and analytics for countering malign influence campaigns to support operations in defense of 2022 midterm elections; document lessons learned. Implement automated anomaly detection and mitigation analytics for defense of critical DoD command and control communications infrastructures. ***FY 2023 Plans:*** NC3 Mission pilot was 2 year funding with the results provided to STRATCOM. ***FY 2022 to FY 2023 Increase/Decrease Statement:***			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0306250F / *Cyber Operations Technology Support*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Funding decreased due to the completion of the NC3 pilot program.			
Accomplishments/Planned Programs Subtotals	226.073	282.218	234.576

	FY 2021	FY 2022
Congressional Add: Cloud Communications Validation Pilot	0.000	0.000
FY 2021 Accomplishments: N/A		
FY 2022 Plans: N/A		
Congressional Adds Subtotals	0.000	0.000

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• OPAF 03 834320: *C3 Countermeasures*	11.986	9.981	3.808	-	3.808	0.000	0.000	0.000	0.025	Continuing	Continuing

Remarks

E. Acquisition Strategy

Facilitate the delivery of technology capabilities to the Cyber Mission Forces, by applying innovative solutions for existing and emerging technologies. Contracts are awarded under full and open competition whenever possible. Variations of both Fixed Price (FP) and Cost Plus (CP) contracting vehicles and the use of Other Transactional Authority (OTA) will be implemented leveraging USCYBERCOM Acquisition authorities. USCYBERCOM will also rely on various Service Component, Combatant Command and National Security Agency contracting offices for procurement of cyber capabilities and contractor support.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0306250F / *Cyber Operations Technology Support*	**Project (Number/Name)** 646008 / *US Cyber Command Technology Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Joint Common Services	Various	Multiple Agencies : Various	-	39.277	Apr 2021	59.403	Apr 2022	59.234	Apr 2023	-		59.234	Continuing	Continuing	-
Joint Access Platforms	Various	Multiple Agencies : Various	-	65.199	Apr 2021	67.323	Apr 2022	47.277	Apr 2023	-		47.277	Continuing	Continuing	-
Joint Tools	Various	Multiple Agencies : Various	-	97.031	Apr 2021	129.182	Apr 2022	116.528	Apr 2023	-		116.528	Continuing	Continuing	-
Joint Sensors	Various	Multiple Agencies : Various	-	19.364	Apr 2021	21.173	Apr 2022	6.437	Apr 2023	-		6.437	Continuing	Continuing	-
Cloud Communication Validation Pilot	TBD	TBD : TBD	-	-		-		-		-		-	Continuing	Continuing	-
		Subtotal	-	220.871		277.081		229.476		-		229.476	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Services	C/CPAF	Not specified. : TBD	-	0.000		-		-		-		-	Continuing	Continuing	-
PMA	Various	Various : Various	-	5.202	Apr 2021	5.137	Apr 2022	5.100	Apr 2023	-		5.100	Continuing	Continuing	-
		Subtotal	-	5.202		5.137		5.100		-		5.100	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	226.073		282.218		234.576		-		234.576	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0306250F / *Cyber Operations Technology Support*	**Project (Number/Name)** 646008 / *US Cyber Command Technology Development*

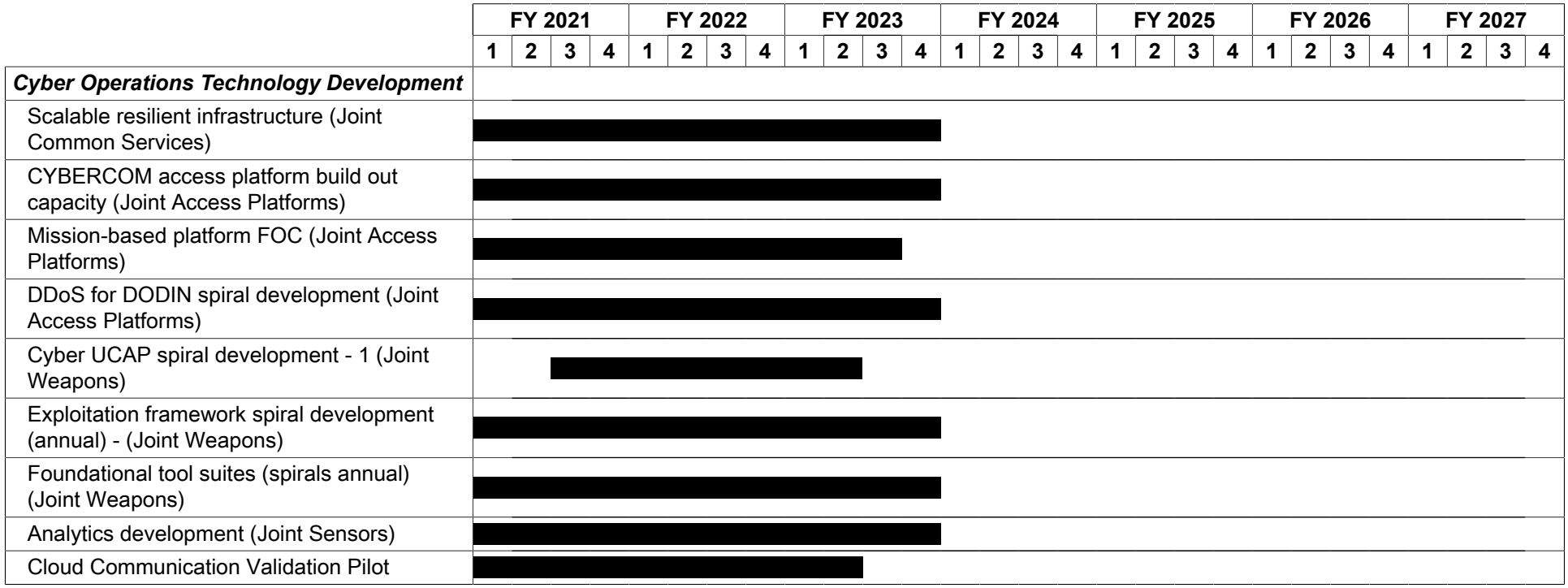

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0306250F / *Cyber Operations Technology Support*	**Project (Number/Name)** 646008 / *US Cyber Command Technology Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Cyber Operations Technology Development				
Scalable resilient infrastructure (Joint Common Services)	1	2021	4	2023
CYBERCOM access platform build out capacity (Joint Access Platforms)	1	2021	4	2023
Mission-based platform FOC (Joint Access Platforms)	1	2021	3	2023
DDoS for DODIN spiral development (Joint Access Platforms)	1	2021	4	2023
Cyber UCAP spiral development - 1 (Joint Weapons)	3	2021	2	2023
Exploitation framework spiral development (annual) - (Joint Weapons)	1	2021	4	2023
Foundational tool suites (spirals annual) (Joint Weapons)	1	2021	4	2023
Analytics development (Joint Sensors)	1	2021	4	2023
Cloud Communication Validation Pilot	1	2021	2	2023

Note

In response to Section 1507 of the FY22 NDAA, the FY24+ funds for PE 0306250F will be transferred to USCYBERCOM to be responsible for the planning, programming, budgeting, and execution of the resources.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0306415F / *Enabled Cyber Activities*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	10.166	24.359	16.728	0.000	16.728	0.000	0.000	0.000	0.000	Continuing	Continuing
646008: *US Cyber Command Technology Development*	-	10.166	24.359	16.728	0.000	16.728	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

US Cyber Command's (USCYBERCOM) mission is to deter or defeat strategic threats to US interests and infrastructure, provide mission assurance for the operations and defense of the Department of Defense information environment, and support the achievement of joint force commander objectives.

USCYBERCOM develops or procures capabilities to enable Electronic Warfare and cyber-peculiar technologies for use by the Cyber Mission Forces (CMF).

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 FY21 $0.000M was expended for civilian pay expenses in this program element, and in FY22 $0.000M is forecasted for civilian pay expenses in this program element.

The FY 2023 funding request was reduced by $3.615 million to account for the availability of prior year execution balances.

The specific details and aspects of these cyber activities are classified and will be provided on a need-to-know basis.

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0306415F / *Enabled Cyber Activities*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	10.541	16.578	0.000	0.000	0.000
Current President's Budget	10.166	24.359	16.728	0.000	16.728
Total Adjustments	-0.375	7.781	16.728	0.000	16.728
• 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	-0.375	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	7.781	16.728	0.000	16.728

Change Summary Explanation

The FY 2022 Appropriations Law, Division N--Ukraine Supplemental, Title III added $7.781M to PE 0306415F.

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Cyber Technology Development	10.166	24.359	16.728
Description: Adapted Electronic Warfare (EW) technology to facilitate the development and delivery of EW and cyber-peculiar capabilities. The origin, details and specific aspects of these efforts are classified. ***FY 2022 Plans:*** Continue to adapt EW technology and cyber-peculiar capabilities to gain access to targeted enemy forces. Continue to enhance the open source Open CPI framework that will allow the services and USCYBERCOM to develop Title 10 off-net effects. Continue to migrate segregated capabilities and Cyber/EW weapons systems onto Common Attack Platforms by implementing common frameworks and common hosting solutions.			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0306415F / *Enabled Cyber Activities*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
The specific details and aspects of these cyber activities are classified and will be provided on a need-to-know basis. ***FY 2023 Plans:*** Will continue to adapt EW technology and cyber-peculiar capabilities to gain access to targeted enemy forces. Will continue to enhance the open source Open CPI framework that will allow the services and USCYBERCOM to develop Title 10 off-net effects. Will continue to migrate segregated capabilities and Cyber/EW weapons systems onto Common Attack Platforms by implementing common frameworks and common hosting solutions. The specific details and aspects of these cyber activities are classified and will be provided on a need-to-know basis. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreased to the program baseline level established prior to inclusion of FY 2022 Appropriations Law supplemental funding for Ukraine.			
Accomplishments/Planned Programs Subtotals	10.166	24.359	16.728

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

Facilitate the delivery of new Electronic Warfare (EW) cyber capability, by applying innovative solutions for existing and emerging technologies. Contracts are awarded under full and open competition whenever possible. Variations of both Fixed Price (FP) and Cost Plus (CP) contracting vehicles will be executed and managed by USCYBERCOM Acquisition authority, as well as various Service Component contracting offices, other Defense Agency contracting offices and the National Security Agency contracting offices.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0306415F / *Enabled Cyber Activities*	**Project (Number/Name)** 646008 / *US Cyber Command Technology Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	C/CPAF	Not specified. : TBD	-	0.000		-		-		-		-	Continuing	Continuing	-
Cyber Technology Development	Various	Multiple Agencies : Various	-	10.166	Apr 2021	24.359	Jan 2022	16.728	Jan 2023	-		16.728	Continuing	Continuing	-
		Subtotal	-	10.166		24.359		16.728		-		16.728	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	10.166		24.359		16.728		-		16.728	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0306415F / *Enabled Cyber Activities*	**Project (Number/Name)** 646008 / *US Cyber Command Technology Development*

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
Electronic Warfare (EW) Capabilities																												
EW Capability Spiral (annual)	[redacted]																											
SATCOM Capability Spiral (annual)	[redacted]																											
Communications Capabiliy Spiral (annual)	[redacted]																											

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0306415F / *Enabled Cyber Activities*	**Project (Number/Name)** 646008 / *US Cyber Command Technology Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Electronic Warfare (EW) Capabilities				
EW Capability Spiral (annual)	1	2021	4	2023
SATCOM Capability Spiral (annual)	1	2021	4	2023
Communications Capabiliy Spiral (annual)	1	2021	4	2023

Note

In response to Section 1507 of the FY22 NDAA, the FY24+ funds for PE 0306415F will be transferred to USCYBERCOM to be responsible for the planning, programming, budgeting, and execution of the resources.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0401310F / *C-32 Executive Transport Recapitalization*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	6.151	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.151
640009: *C-32 Executive Transport Recap*	-	6.151	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.151
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

NOTE: FY18-20 Prior Years Funding of 7.762M was executed in Program Element 0401310F, BPAC 654019, BA05.

The C-32A mission is to provide Executive Airlift transportation for the First Lady, Vice President, Cabinet, Congress, and foreign Heads of State. The C-32A also serves as the backup to the VC-25 Presidential support aircraft.

The C-32 Executive Transport Recapitalization program was intended to replace the aging C-32A aircraft fleet. The Air Force and Navy were engaged in an effort to recapitalize the National Military Command System fixed-wing aircraft and large capacity Executive Airlift fleets. The aircraft consist of the Air Force E-4B National Airborne Operations Center (NAOC), Air Force C-32A Executive Airlift (EA), and the Navy E-6B Airborne Command Post (ABNCP) and Take Charge and Move Out (TACAMO) aircraft. These platforms are aging and increasingly difficult to support. The combined effort explored the realignment of missions among platforms and examined the potential benefits of acquiring common airframes without sacrificing operational effectiveness or increasing overall costs.

This effort was called the NEAT (NNAOC, EEA, A ABNCP, TTACAMO) Analysis of Alternatives (AoA) and it concluded in September 2020 with no impact or actions for the C-32 fleet. After 2020, all remaining funding in Program Element 0401310F was applied to the evaluation and maturation of advanced high speed transport scale aircraft with potential to expand the defense industrial base and serve as C-32A replacements at the appropriate time.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver the C-32 Executive Transport Recap system capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program element 0605831F. In FY 2021 $00.000 million was expended for civilian pay expenses in this program element, and in FY 2022 $00.000 million is forecasted for civilian pay expenses in this program element.

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0401310F / *C-32 Executive Transport Recapitalization*	

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	6.197	0.000	0.000	0.000	0.000
Current President's Budget	6.151	0.000	0.000	0.000	0.000
Total Adjustments	-0.046	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	-0.046	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: C-32A Executive Transport Recapitalization Analysis of Alternatives (AoA)	6.124	0.000	0.000	0.000	0.000
Description: Expand upon the AoA to study viability of advanced commercial derivative aircraft to mitigate capability gaps. ***FY 2022 Plans:*** N/A ***FY 2023 Base Plans:*** N/A ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A					
Title: C-32 Executive Transport Recapitalization Program Office Closeout	0.027	0.000	0.000	0.000	0.000
Description: Support Directorate and Program Office efforts to closeout C-32 Recapitalization activities. ***FY 2022 Plans:*** N/A ***FY 2023 Base Plans:***					

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0401310F / *C-32 Executive Transport Recapitalization*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
N/A ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A					
Accomplishments/Planned Programs Subtotals	6.151	0.000	0.000	0.000	0.000

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• RDTE 05 0401310F: *C-32 Executive Transport Recapitalization*	0.000	0.000	0.000	-	0.000	0.000	0.000	-	-	0.000	0.000

Remarks

E. Acquisition Strategy

AoA expansion will include technology maturation risk reduction activities to inform future C-32A replacement aircraft.
- Early focus on Technology Maturation Risk Reduction on critical performance capabilities identified during material solution analysis phase to support technical maturity of key capabilities and inform requirements for future CDD generation.
- Risk reduction activities and technology maturity assessments outcome will be used to further develop acquisition strategy for a Pre-milestone B entry and subsequent solicitation for a full and open competition.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0401310F / *C-32 Executive Transport Recapitalization*	Project (Number/Name) 640009 / *C-32 Executive Transport Recap*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	Various	TBD : TBD	-	-		0.000	May 2022	-		-		-	0.000	0.000	-
C-32 Executive Transport Recapitalization: Analysis of Alternatives Expansion	Various	TBD : TBD	-	6.124	May 2021	-		-		-		-	0.000	6.124	-
		Subtotal	-	6.124		0.000		-		-		-	0.000	6.124	N/A

Remarks

FY18-20 Prior Years Funding was executed in PE 0401310F, BPAC 654019, BA05

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
C-32 Executive Transport Recapitalization: PSC Contractor Services and PSC Other Government Costs	Various	TBD : Dayton, OH	-	0.027	May 2021	-		-		-		-	0.000	0.027	-
		Subtotal	-	0.027		-		-		-		-	0.000	0.027	N/A

Remarks

FY18-20 Prior Years Funding of was executed in PE 0401310F, BPAC 654019, BA05

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	6.151		0.000		-		-		-	0.000	6.151	N/A

Remarks

-FY2018-2020 RDT&E Funding ($7.762M) was executed in PE 0401310F, BPAC 654019, BA05

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0401310F / *C-32 Executive Transport Recapitalization*	**Project (Number/Name)** 640009 / *C-32 Executive Transport Recap*

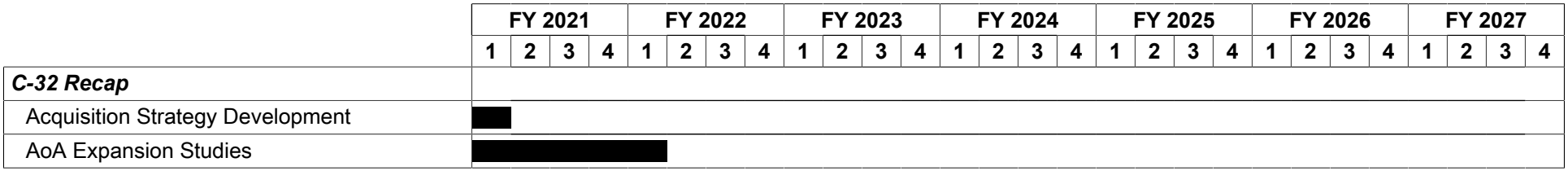

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0401310F / *C-32 Executive Transport Recapitalization*	**Project (Number/Name)** 640009 / *C-32 Executive Transport Recap*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
C-32 Recap				
Acquisition Strategy Development	1	2021	1	2021
AoA Expansion Studies	1	2021	1	2022

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0708051F / *Rapid Sustainment Modernization (RSM)*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	34.693	65.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	99.693
648051: *Rapid Sustainment Modernization Technologies*	-	34.693	65.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	99.693
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Rapid Sustainment Modernization program provides funding to the Rapid Sustainment Office (RSO). The RSO will develop, test and deploy new technologies for implementation across the sustainment enterprise, to improve readiness, and reduce sustainment costs.

RSO will achieve this by reaching across the sustainment enterprise to include the warfighter, depot maintenance, field maintenance, supply chain and program offices to identify enterprise needs. RSO will then identify, assess, develop, validate and verify new technology projects that support these areas, all while reducing costs and increasing aircraft readiness

RSO New Sustainment technologies such as; Conditioned Based Mtx Plus (CBM+), Advanced Manufacturing (AM/Coldspray), Digital Engineering, Automation/Robotics, Augmented and Virtual Reality, Austere/Contested environments are evaluated across the technology space in support of the Department of the Air Force (DAF) sustainment enterprise

This is a new program element created based off the FY 2021 appropriation line item 56A. This requirement is not a new start as it was previously funded and executed with DAF Research, Development, Test and Evaluation (RDT&E) funding.

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 FY 2021 $0 million was expended for civilian pay expenses in this program element.

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0708051F / *Rapid Sustainment Modernization (RSM)*	

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	19.964	0.000	0.000	0.000	0.000
Current President's Budget	34.693	65.000	0.000	0.000	0.000
Total Adjustments	14.729	65.000	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	14.729	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	65.000	0.000	0.000	0.000

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Rapid Sustainment Modernization	34.693	65.000	0.000	0.000	0.000
Description: Advanced Repair and Qualification ***FY 2022 Plans:*** Not Applicable ***FY 2023 Base Plans:*** Not applicable ***FY 2023 OCO Plans:*** Not applicable ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 has decreased by $65.000 million compared to FY 2022 due to the program mentioned above.					
Accomplishments/Planned Programs Subtotals	34.693	65.000	0.000	0.000	0.000

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0708051F / *Rapid Sustainment Modernization (RSM)*

E. Acquisition Strategy

Funding in this program is used toward Rapid Sustainment Office requirements.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0708051F / *Rapid Sustainment Modernization (RSM)*	**Project (Number/Name)** 648051 / *Rapid Sustainment Modernization Technologies*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Digital Engineering - Digital Twin	TBD	Various : Wichita, KS	-	34.693		65.000		-		-		-	Continuing	Continuing	-
Advanced Repair and Qualification Processes	C/Various	Various : Tinker AFB, OK	-	-		-		-		-		-	Continuing	Continuing	-
		Subtotal	-	34.693		65.000		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	34.693		65.000		-		-		-	Continuing	Continuing	N/A

Remarks

FY20 - New areas of additive manufacturing and cold spray technologies, equipment and qualification processes that are maturing and providing benefit to the DAF

FY21 - Digital Engineering/Digital Twin: digital transformation of the existing Air Force fleet to increase operational readiness levels, decrease parts obsolescence and diminishing manufacturing sources required to get mission capable rates to acceptable levels

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0708051F / *Rapid Sustainment Modernization (RSM)*	**Project (Number/Name)** 648051 / *Rapid Sustainment Modernization Technologies*

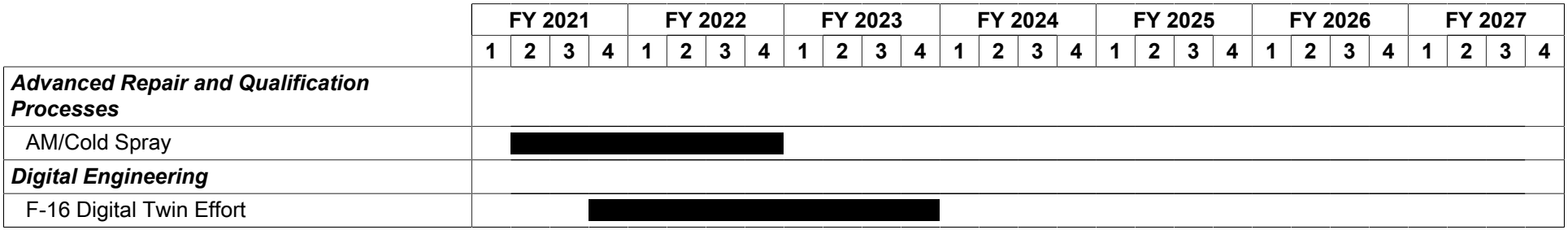

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0708051F / *Rapid Sustainment Modernization (RSM)*	**Project (Number/Name)** 648051 / *Rapid Sustainment Modernization Technologies*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Advanced Repair and Qualification Processes				
AM/Cold Spray	2	2021	4	2022
Digital Engineering				
F-16 Digital Twin Effort	4	2021	4	2023

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0808737F / *CVV Integrated Prevention*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	0.000	0.000	9.315	0.000	9.315	9.342	8.307	7.272	7.286	Continuing	Continuing
648737: *Sexual Assault Prvntion Study*	-	0.000	0.000	9.315	0.000	9.315	9.342	8.307	7.272	7.286	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 4, PE 0808737F, project 648737, ORION Continuous Capability & Case Management Framework Development, is a new start.
This program, BA 4, PE 0808737F, project 648737, ISDVP Research & Development, is a new start.

A. Mission Description and Budget Item Justification

Following completion of a Presidentially-directed Independent Review Committee (IRC) on Sexual Assaults for the Department of Defense, the Secretary of Defense (SECDEF) directed the implementation of multiple IRC recommendations. The Integrated Prevention PE contains two programs in support of those recommendations: The Air Force Office of Special Investigations (OSI), Records, Investigations and Operations Network (ORION) program and the Interpersonal Self-Directed Violence (ISDV) Prevention program.

Air Force Office of Special Investigations (OSI), Records, Investigations and Operations Network (ORION):

The Department of the Air Force (DAF) Office of Special Investigations (OSI) is DAF's sole felony-level criminal investigative agency mandated to investigate criminal offenses, to include sexual offenses and interpersonal violence. IRC recommendations C2, C3, C4, 1.8, 2.6a, 3.1, and 3.3a, directed the DAF to increase its ability to collect, analyze, and integrate data related to sexual offenses and interpersonal violence to inform and guide prevention and response. The DAF will develop and deploy the OSI Investigations, Operations, and Records Network (ORION) information system as to satisfy SECDEF requirements.

In tandem with the context above, another key driver for development of ORION is the DAF's requirement to identify a central case management system solution to allow for more effective oversight of and more efficient execution of the DAF's criminal indexing process.

ORION will be a cloud-based, next-generation case management system used to document, manage, store, and report criminal investigative and counterintelligence information involving violations of the Uniform Code of Military Justice and the United States Code. ORION will serve as OSI's central mission application capable of ensuring sexual assaults, intimate partner violence, violent extremism, service-member deaths, and dozens of other crimes are properly investigated and recorded. ORION will be used by over 3,000 OSI personnel including nearly 2,000 federally-credentialed Special Agents at OSI's 300+ global operating locations.

ORION will enable the DAF to modernize criminal indexing processes both operationally and technologically. Operationally, ORION will reduce redundancy, streamline processes, encourage standardization, and decrease administrative burden. The DAF is exploring options to use ORION to replace other systems and enable data transfer to other stakeholders with the goal to increase integration and productivity and avoid duplicative data entry. ORION could also be leveraged to be placed on

one or more Special Access Programs (SAP) networks to become a system of record for OSI investigative and security support to DAF SAP programs. Technologically, ORION leverages the affordability, scalability, security, and services provided by cloud computing. Additionally, ORION will be mobile-ready, enabling agents to securely access and document investigative data from mobile devices whenever and wherever needed, thereby increasing efficiency and reducing delays. Lastly, ORION will be built on a low-code/no-code enterprise platform which enables the rapid development, deployment, and sustainment of capability.

The DAF is considering options to leverage ORION and its enterprise low-code/no-code platform for other DAF case management and/or business process management requirements. Such a platform, operated and sustained at the enterprise level, has potential to yield cost savings, operational enhancements, and technical efficiencies as well as reduce DAF overheard. With ORION serving as the initial application, the case management platform could promote the expedited development, deployment, and sustainment of future case management systems at economies of scale.

Air Force Integrated Resilience Office (A1Z), Interpersonal Self-Directed Violence Prevention:

The Department of the Air Force (DAF) Integrated Resilience Directorate (A1Z) is the Air Force's lead agency for the research, development, and analysis of ISDV prevention and resilience programming across The Force. The IRC recommended multiple initiatives to help the Services research, develop, and assess interpersonal and self-directed violence (ISDV) prevention strategies. ISDV encompasses sexual assault, domestic violence, suicide, and resilience. IRC recommendations 2.3, 2.4, 2.6, and 3.5 directed the DAF to implement prevention strategies at organizational and community levels through the modernization of prevention education, training, program evaluation, and improved processes for data collection and analysis. The DAF will execute the IRC's recommendations in support of initiatives to include, but not limited to:

- The Tech-based Machine Learning Initiative - A state-of-the-art DoD prevention research capability that utilizes machine learning algorithms to analyze qualitative data to identify trends that lead to ISDV.

- The Community Prevention Platform (CPP) - A web-based software system that will maintain Installation and Major Command community action plans and facilitate DAF Headquarters ability to track and assess plans.

- The Peer-Network Resilience Training Program (PRTP) - An initiative to analyze and modernize current resilience training processes to more effectively reflect today's generation of Service members.

- The Project Proficiency-based Sexual Assault Training (PSAT) - This initiative will similarly update and expand the current Air Force sexual assault training by implementing tailored-training based on subject knowledge as well as long-term training-competency tracking for Airmen/Guardians over their career cycle.

- The Sexual Assault Prevention Response Virtual Reality (SAPR VR) - This initiative will further enhance training initiatives by implementing cutting-edge Virtual Reality capability to more effectively enable Airmen and Guardians to recognize and prevent sexual assault.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0808737F / *CVV Integrated Prevention*

The DAF is committed to implementing the Commission's recommendations to more effectively identify behavioral and cultural contributors to ISDV, educate/train Airmen and Guardians to facilitate ISDV prevention, and transparently document and track Installation-level strategies to facilitate evaluation.

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 $0M was expended for civilian pay expenses in this program element, and in CY $0M is forecasted for civilian pay expenses in this program element.

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

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	9.315	0.000	9.315
Total Adjustments	0.000	0.000	9.315	0.000	9.315
• 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	9.315	0.000	9.315

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: ORION Continuous Capability & Case Management Framework Development	-	0.000	4.140	0.000	4.140
Description: ORION will be developed, optimized, and enhanced through the completion of iterative software development cycles using an agile software development methodology. Development will focus on building functionality and capability for ORION. Development activities include licensing, system design and architecture, requirements analysis, product building, planning and testing, data migration as required, systems integration, and the establishment and incorporation of various cloud services. Additionally, development includes various services and program support activities for ORION and enabling a larger Air Force Case Management Platform.					
FY 2022 Plans:					

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0808737F / *CVV Integrated Prevention*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
N/A ***FY 2023 Base Plans:*** - Will initiate development activities for ORION - Will conduct iterative software development and integration of the ORION application - Will optimize, test and complete ORION cloud implementation - May establish an Air Force Case Management Framework - Will establish, test, and complete new and existing ORION integrations with other OSI, Air Force, DoD, and criminal justice systems to increase data sharing and mission effectiveness. - Will ensure robust ORION system security and support the Risk Management Framework (RMF) through continuous monitoring activities - Will support 24/7 operations for global ORION user community through Help Desk operations, functional expertise, technical support, and other user needs - Will operate, manage, and maintain ORION application and ORION cloud environment - Will deploy fixes to address new and existing software defects and user-identified problems - Will develop integrated ORION Business Intelligence (BI) functionality to enhance reporting capability - Will initiate discovery planning and development of classified components of ORION - Will establish ORION in IL-6 classified cloud environment ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** This is a New Start, and was not resourced in FY22.					
Title: ISDVP Research & Development ***Description:*** The DAF will conduct numerous research and development initiatives to more effectively determine trends in ISDV events, precursors, and preventative factors. These initiatives include modernizing prevention education and training programs and evaluating their effectiveness; developing software solutions to streamline, modernize, and improve community-level prevention strategies; and leveraging machine learning to determine trends that engender ISDV activities. All initiatives address IRC recommendations and will be designed to improve the overall health and well-being of Total Force Airmen and Guardians. ***FY 2022 Plans:***	-	0.000	5.175	0.000	5.175

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0808737F / *CVV Integrated Prevention*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
N/A ***FY 2023 Base Plans:*** - Will identify software solutions and develop minimum viable capability to store and track community action plans - Will conduct business process mapping initiatives to refine requirements and plan interface coordination - Will integrate data push/pull mechanisms with software programs - Will develop key markers of success for prevention program evaluation and modernization efforts - Will evaluate existing ISDV prevention education/training programs and develop a prioritized modernization strategy - Will develop, test, and deploy modernized ISDV prevention education/training programs leveraging advanced training techniques, such as virtual reality - Will develop and pilot career-long evaluation plans to track effectiveness - Will develop, test, and refine Machine Learning models for to conduct trend analysis on years of Airmen and Guardians' climate surveys and other feedback mechanisms ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** This is a New Start, and was not resourced in FY22.					
Accomplishments/Planned Programs Subtotals	-	0.000	9.315	0.000	9.315

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

ORION:

ORION will adopt an agile, phased approach to application development and deployment. ORION development will be a collaborative process to include a cadre of experienced Special Agents, functional experts, and software developers. In addition to managing OSI's law enforcement-related criminal investigations information, ORION will also manage counterintelligence investigations and operations. Ultimately, the classified and unclassified versions of ORION will share limited data through

an automated, bi-directional, cross-domain solution to ensure users have ready access to both criminal and counterintelligence information. Once complete, ORION will fully subsume OSI's current management systems and serve as OSI's investigative system of record.

In tandem with ORION development, the DAF is considering options to leverage this program to enable a larger DAF Case Management Platform. This platform would provide DAF customers requiring similar case management capabilities with the ability to share and modify system components and workflows, establish best practices, benefit from economies of scale, share/reduce costs, implement uniformity across systems, and decrease time required to deliver capability to end-users. This platform would also lessen overall administrative burdens associated with Clinger-Cohen Act compliance, the Business Capability Acquisition Cycle (BCAC), and program management.

ISDV Prevention:

This effort explores numerous initiatives to ultimately prevent ISDV. The DAF will execute agile processes within all initiatives. Software solutions will develop and deploy minimum viable capability early and continue to refine based on prioritized need. Research and analysis initiatives will seek industry best practices to implement novel technological solutions to these tough problem sets.

Contract strategies will require multiple approaches with a focus on best value and rapid execution. Efforts may also leverage existing AFRL SBIRs and Air University collaborations with Subject Matter Experts (SMEs) and nationally recognized experts from Industry and Academia.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0808737F / *CVV Integrated Prevention*	**Project (Number/Name)** 648737 / *Sexual Assault Prvntion Study*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ORION: Application Development	C/CPAF	TBD : TBD	-	0.000		0.000		2.150	Feb 2023	-		2.150	Continuing	Continuing	-
ORION: Cloud Hosting	MIPR	TBD : TBD	-	0.000		0.000		0.385	Dec 2022	-		0.385	Continuing	Continuing	-
ORION: Cloud Implementation	MIPR	TBD : TBD	-	0.000		0.000		0.505	Dec 2022	-		0.505	Continuing	Continuing	-
ISDVP: Application Development	C/FFP	TBD : TBD	-	-		-		0.624	Mar 2023	-		0.624	Continuing	Continuing	-
ISDVP: Edu/Training Modernization	C/FFP	TBD : TBD	-	-		-		0.400	Mar 2023	-		0.400	Continuing	Continuing	-
ISDVP: Trend Analysis	C/FFP	TBD : TBD	-	-		-		0.500	Mar 2023	-		0.500	Continuing	Continuing	-
ISDVP: Curriculum Development/ Implementation/Evaluation	C/FFP	TBD : TBD	-	-		-		3.089	Mar 2023	-		3.089	Continuing	Continuing	-
		Subtotal	-	0.000		0.000		7.653		-		7.653	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ORION: Cybersecurity	C/CPAF	TBD : TBD	-	0.000		0.000		0.205	Dec 2022	-		0.205	Continuing	Continuing	-
		Subtotal	-	0.000		0.000		0.205		-		0.205	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ORION: Cloud Management	C/CPAF	TBD : TBD	-	0.000		0.000		0.358	Dec 2022	-		0.358	Continuing	Continuing	-
ORION: Application Management	C/CPAF	TBD : TBD	-	0.000		0.000		0.312	Feb 2023	-		0.312	Continuing	Continuing	-
ORION: Program Support	MIPR	AFLCMC/HI : Gunter AFB, AL	-	0.000		0.000		0.225	Dec 2022	-		0.225	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0808737F / *CVV Integrated Prevention*	Project (Number/Name) 648737 / *Sexual Assault Prvntion Study*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ISDVP: Application Management	C/CPAF	TBD : TBD	-	-		-		0.312	Mar 2023	-		0.312	Continuing	Continuing	-
ISDVP: Program Support	C/CPAF	TBD : TBD	-	-		-		0.250	Mar 2023	-		0.250	Continuing	Continuing	-
		Subtotal	-	0.000		0.000		1.457		-		1.457	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.000		0.000		9.315		-		9.315	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0808737F / *CVV Integrated Prevention*	**Project (Number/Name)** 648737 / *Sexual Assault Prvntion Study*

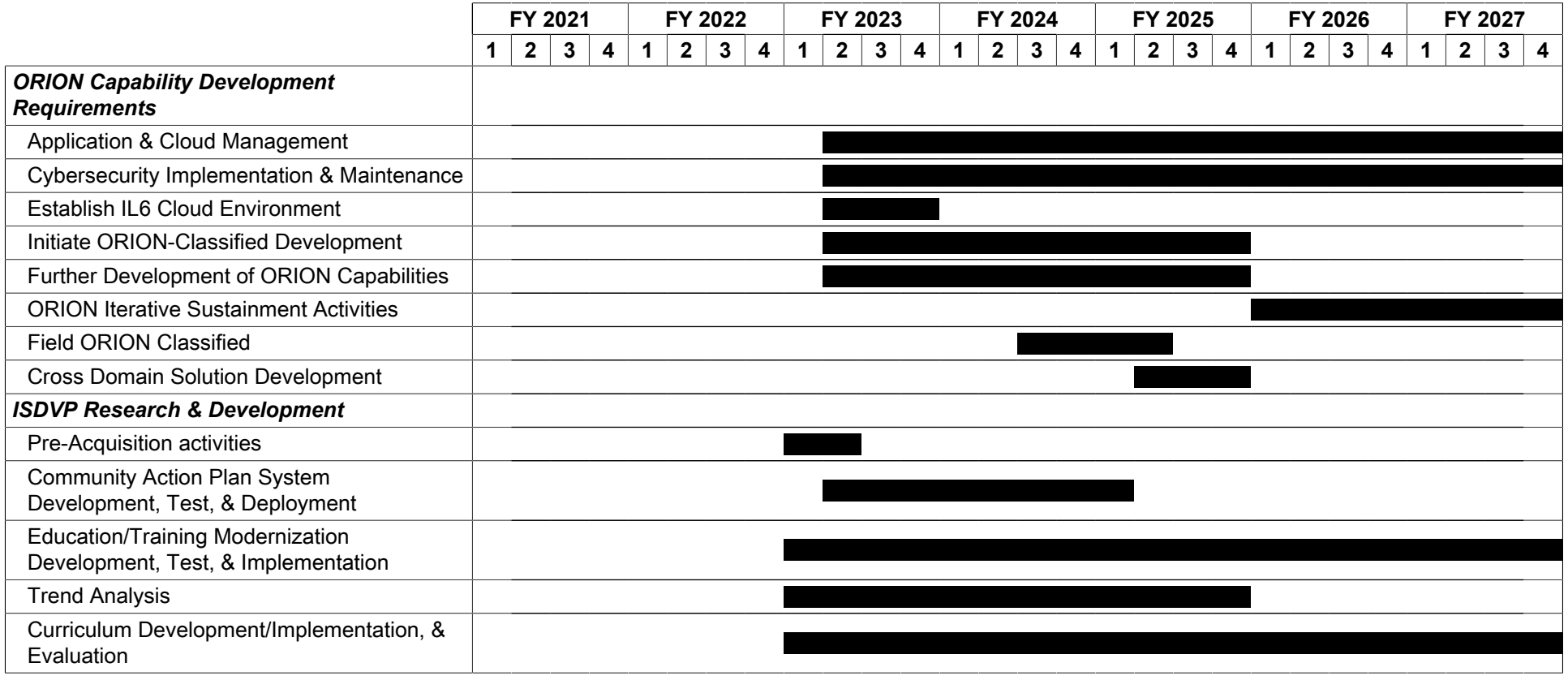

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0808737F / *CVV Integrated Prevention*	**Project (Number/Name)** 648737 / *Sexual Assault Prvntion Study*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ORION Capability Development Requirements				
Application & Cloud Management	2	2023	4	2027
Cybersecurity Implementation & Maintenance	2	2023	4	2027
Establish IL6 Cloud Environment	2	2023	4	2023
Initiate ORION-Classified Development	2	2023	4	2025
Further Development of ORION Capabilities	2	2023	4	2025
ORION Iterative Sustainment Activities	1	2026	4	2027
Field ORION Classified	3	2024	2	2025
Cross Domain Solution Development	2	2025	4	2025
ISDVP Research & Development				
Pre-Acquisition activities	1	2023	2	2023
Community Action Plan System Development, Test, & Deployment	2	2023	1	2025
Education/Training Modernization Development, Test, & Implementation	1	2023	4	2027
Trend Analysis	1	2023	4	2025
Curriculum Development/Implementation, & Evaluation	1	2023	4	2027

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0901410F / *Contracting Information Technology System*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	5.555	20.343	14.050	0.000	14.050	14.343	14.410	14.716	15.043	Continuing	Continuing
643483: *CON-IT*	-	5.555	20.343	14.050	0.000	14.050	14.343	14.410	14.716	15.043	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Contracting Information Technology (CON-IT) system enables the Department of the Air Force (DAF) to accomplish its mission effectively and securely in today's rapidly changing and increasingly contested cyber domain. The Air and Space Forces require a single, 21st century contract management solution to enable DAF mission execution, from acquiring and sustaining weapon system platforms, to supporting contingency operations overseas. CON-IT supplies this single solution by consolidating and replacing numerous aging and increasingly unsupportable, legacy contract writing and management systems, while enabling the Air and Space Forces to procure vital capability faster and with increased data accuracy through built-in automation.

Specifically, CON-IT's functionality provides contract data sharing interoperability across all DAF contracting communities and external business partners such as Defense Contract Management Agency, Defense Finance and Accounting Service, and industry partners. In addition, CON-IT facilitates the execution of the DAF's $200+ billion annual budget, ensuring global procurement operations are timely, auditable, and secure.

CON-IT enables the DAF to anticipate and respond to the changing pace and dynamic nature of processes, regulations, and technologies across the contracting domain. It empowers the contracting community to comply with Financial Improvement Audit Readiness (FIAR). CON-IT supports performance of a full financial audit as required by title 10 U.S.C. Chapter 9A, Sec 240-D. CON-IT is the DAF's only contract writing system meeting Section 862 of FY13 NDAA requirements implementing DoD Procurement Data Standards (PDS). In addition, CON-IT implements Section 508 of the Rehabilitation Act of 1973 (as amended) to make electronic and information technology (EIT) accessible to people with disabilities.

To modernize the DAF contracting infrastructure, requirements are divided into 2 objectives.

Objective 1: Develop the following 8 capabilities, organized primarily by contract writing community:

- Capability 1: Modernize contract writing for 3,800 operational/installation contracting users, sunsetting the Standard Procurement System (SPS) system. (Completed in FY19; first and only service to comply with OSD's original SPS sunset mandate)

- Capability 2: Modernize contract writing capability for the contingency contracting community, sunsetting O'Contrax system. (Completed in FY20)

- Capability 3: Modernize contract writing capability for 2,500 Weapon Systems contracting users, sunsetting ConWrite, a 20+ year-old system containing contracts worth more than $2 trillion for major weapon system programs such as B-21, KC-46, and more. (Completed 3 Limited Deployments between FY21-FY22)

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0901410F / *Contracting Information Technology System*

- Capability 4: Deliver Business Intelligence (BI) capability to provide timely and reliable data for decision makers across the entire DAF.

- Capability 5: Modernize capability to meet the unique classified needs within all contracting communities. This capability is on the critical path to sunset ConWrite (Capability 3).

- Capability 6: Modernize capability to meet the unique needs of the R&D community to execute grants and cooperative agreements. This capability is on the critical path to sunset ConWrite (Capability 3).

- Capability 7: Add E-Filing capability to provide a single, authoritative source for electronic contract file storage with capability to search and review individual documents.

- Capability 8: Modernize contract writing capability for 1,500 Logistics contracting community users to award weapon system sustainment product support/logistics requirements. Enables the DAF to sunset the Automated Contract Preparation System (ACPS), a 30+ years old legacy system.

Objective 2: Maintain Compliance. CON-IT has awarded over 171,907 contract actions, totaling $51 billion through FY21. The system is currently deployed to 4,476 users across 150 installations worldwide. The DAF continuously addresses numerous technical debt backlog requirements to maintain system functionality and meet modern data standards. These initiatives also develop capability to maintain compliance with Federal and OSD mandates, coordinate DevSecOPs, and improve infrastructure and system performance.

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 FY 2021 $0.00M was expended for civilian pay expenses in this program element, and in FY 2022 $0.00M is forecasted for civilian pay expenses in this program element.

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0901410F / *Contracting Information Technology System*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	5.662	20.343	0.000	0.000	0.000
Current President's Budget	5.555	20.343	14.050	0.000	14.050
Total Adjustments	-0.107	0.000	14.050	0.000	14.050
• 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	-0.107	0.000			
• Other Adjustments	0.000	0.000	14.050	0.000	14.050

Change Summary Explanation

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY 2023 cannot be made in a relevant manner.

The FY 2021 funding request was reduced to account for the availability of prior year execution balances.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: CON-IT System Development	5.555	20.343	14.050
Description: CON-IT development is accomplished using agile software development practices to build upon a Government-off-the-Shelf contract management system to replace four legacy contract writing systems and multiple support systems. Development efforts are phased into 8 major capabilities according to the requirements of each contracting community (i.e., Weapon Systems, Classified, Research and Development, and Logistics). This enables phased transitions from the various legacy systems to CON-IT. Thus far, the DAF completed Capabilities 1 and 2, and deployed CON-IT to the operational/installation and contingency contracting communities. Capabilities 3 and 4 are in work. Within Capability 3, the DAF delivered CON-IT to 582 weapon systems contracting users. Additional users will be added as capabilities are developed; including an additional 500 users in FY22. Capability 4 impacts all contracting communities. Consistent CLIN-level data collection increased BI capability resulting in a DAF Acquisition Excellence Award. BI efforts continue to be refined and automated; enhancements are delivered as they are developed. Capabilities are fielded utilizing the Minimum Viable Product (MVP) concept for each user group. The MVP contains the minimum set of requirements users need to complete their mission. The deployed MVP is then continually enhanced and refined in future capability releases.			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0901410F / *Contracting Information Technology System*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Based on lessons learned from other DAF and sister service business systems, the DAF re-evaluated its previously-accomplished business process mapping procedures for Capabilities 3, 4, and 6 as well as scaling requirements for the underlying system. While on-going development initiatives still support numerous FY22 capability deliveries, the entire schedule has been re-aligned to better meet requirements, enable more robust testing, improve interface exchange management, and more effectively balance risk. Capability 3 and 4 deliveries will complete in 1QFY25 and 4QFY24 respectively. Capability 6 development activities will begin thereafter. ***FY 2022 Plans:*** The DAF will continue to develop Capabilities 3 and 4 and begin to plan Capability 5. The weapon systems community (Capability 3) has the DAF's most complex and unique contracting needs. Unlike Capabilities 1 and 2, baseline software code and business process automation do not exist for Capability 3 requirements; specifically those needed to sunset the legacy ConWrite system. FY22 development initiatives will enable 500-1,000 new Capability 3 users to transition to CON-IT. Examples of specific requirements to be addressed in FY22 are included below: - Implement Exhibit Line Items (often used for spare parts on major aircraft acquisitions) - Add ability to use and track legacy and local clauses to preserve existing contract agreements with legacy contracts and to provide flexibility in crafting custom contract terms - Add the capability to award undefinitized contract actions (UCAs) enabling immediate contract performance commencement while definitive contract negotiations are finalized; this is a critical tool to support foreign military sales and (joint) urgent operational needs - Automate the incorporation of clause updates prior to award with tighter integration of the DoD-mandated Clause Logic Service (CLS) - Implement Federal mandate to identify contractors using a Unique Entity Identifier (UEI) vice the Data Universal Numbering System (DUNS) - Address need to pay a contractor incrementally across multiple entitlement systems in a more timely and accurate manner - Add the ability to interface with additional financial systems to enable seamless Procure-to-Pay data flow and eliminate admin errors for joint procurement efforts - Enhance the ability to Import and Export line items from other contracts and add the ability to incorporate special characters and tables; these are key enablers for managing thousands of contract line items and supporting legacy contracts from ConWrite - Automate award synopsis for public transparency of contract awards - Provide capabilities to support multiple deliveries from legacy writing systems - Continue to maintain required computing environments (e.g. development, test and production). - Continue developing Business Intelligence functionality to enhance contract writing and reporting capability (Capability 4) - Plan Capability 5 development activities for the Classified contract writing community.			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0901410F / *Contracting Information Technology System*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
- Continue developing system updates required to maintain compliance with Federal and Office of the Secretary of Defense (OSD) contract writing mandates; the regulations and laws surrounding contracting can change frequently--Contract Writing Systems must be adaptable to maintain pace with all mandated changes - Continue developing business rules to improve data compliance with existing regulations and mandated data standards - Continue to leverage agile development methods and cadence to address/mature emerging requirements and add enhancements - Will continue to design, build and refine a secure and continuous process and platform for capability development and delivery ***FY 2023 Plans:*** The DAF will continue to develop Capabilities 3 and 4, and plan development activities for Capabilities 5 (Classified) and 6 (R&D). As with weapon systems, CON-IT does not contain an existing baseline to develop R&D capability from. R&D business processes will be developed from scratch, implementing a new data standard that OSD is currently developing for use across all Services. Examples of specific requirements to be addressed in FY23 are included below: - Will add digital signature capability for electronic processing of contractual documents - Will implement capability for contracts to ingest and transmit the Standard Line of Accounting (SLOA) format per OSD mandate vice the legacy long line of accounting format - Will enhance capability to write complex incentive-type contracts - Will begin construction on database backbone and business logic for grants and cooperative agreements - Will continue to develop Business Intelligence functionality to enhance contract writing and reporting capability (Capability 4) - Will continue to develop system updates required to maintain compliance with Federal and Office of the Secretary of Defense (OSD) contract writing mandates; the regulations and laws surrounding contracting can change frequently, Contract Writing Systems must be adaptable maintain pace with all mandated changes - Will continue developing business rules to improve data compliance by ensuring users comply with existing regulations and Procurement Data Standard (PDS) - Will continue to leverage Agile methods and cadence to resolve existing/new defects and add enhancements in the production environment - Will continue to research, design, and build a secure and continuous process for capability development and delivery - Will plan development activities for Capabilities 5 and 6 ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreased due to higher DAF priorities.			
Accomplishments/Planned Programs Subtotals	5.555	20.343	14.050

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0901410F / *Contracting Information Technology System*

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

Built upon the Defense Information Systems Agency's Integrated Defense Enterprise Acquisition System contract writing system, CON-IT is based on a Government-off-the-Shelf product running on a Commercial Off-the-Shelf platform. Through an interagency agreement, the DAF partnered with the United States Department of Agriculture's (USDA) Enterprise Application Services (EAS) team to develop, test, validate, deploy, and maintain CON-IT. The USDA Digital Infrastructure Services Center currently provides and maintains hosting for the development and production environments in USDA's Enterprise Data Centers. The long-term cloud strategy will utilize a DoD/DAF (e.g., Cloud One) platform. (Note: Cloud migration activities will be primarily conducted via Operations & Maintenance funds) In accordance with DoDI 5000.75, the program management office (PMO) and the functional management office (FMO) are jointly accountable for the successful delivery of business process design through business system deployment and capability support.

CON-IT is developed using agile software development principles. Requirements are envisioned at a high level, then decomposed into small pieces of effort to allow for just-in-time development and maximum flexibility to meet emerging needs. A Minimum Viable Product (MVP) is developed and fielded to satisfy bare-minimum user requirements. As development continues, the DAF will deliver iterative releases to mature the MVP. This commonly-used practice in the commercial industry speeds time to market and allows for rapid reprioritization of requirements based on external influences (e.g., warfighter needs, cybersecurity threats).

CON-IT implements the OSD Strategic Plan for Defense-Wide Procurement Capabilities to employ the Procurement Data Standard mandated by Section 862 of the FY13 NDAA.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0901410F / *Contracting Information Technology System*	**Project (Number/Name)** 643483 / *CON-IT*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CON- IT Development Support	MIPR	USDA : Various	-	1.241	Oct 2020	4.890	Dec 2021	5.037	Dec 2022	-		5.037	Continuing	Continuing	11.168
CONT-IT Compliance Updates & Mandates	MIPR	USDA : Various	-	0.563	Oct 2020	2.014	Dec 2021	2.074	Dec 2022	-		2.074	Continuing	Continuing	4.651
CON-IT New Application Development	MIPR	USDA : Various	-	2.252	Oct 2020	8.054	Dec 2021	1.800	Dec 2022	-		1.800	Continuing	Continuing	12.106
		Subtotal	-	4.056		14.958		8.911		-		8.911	Continuing	Continuing	N/A

Remarks

Interagency agreement with USDA (United States Department of Agriculture)

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CON-IT System Quality Assurance & Test	MIPR	USDA : Various	-	0.390	Oct 2020	0.705	Dec 2021	0.726	Dec 2022	-		0.726	Continuing	Continuing	1.821
		Subtotal	-	0.390		0.705		0.726		-		0.726	Continuing	Continuing	N/A

Remarks

USDA: United States Department of Agriculture

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CON-IT: Program Support, Cost Estimating Support, Travel, Supplies, Equipment, Program Office Network	Various	PEO Business Sys (AFLCMC) : WPAFB, OH	-	1.109	Oct 2020	4.680	Dec 2021	4.413	Dec 2022	-		4.413	Continuing	Continuing	10.202
		Subtotal	-	1.109		4.680		4.413		-		4.413	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0901410F / *Contracting Information Technology System*	Project (Number/Name) 643483 / *CON-IT*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks A&AS: Advisory & Assistance Services Multiple contract awards for less than $1M per award AFPEO/Business & Enterprise Systems (AFLCMC/HI) - Wright-Patterson AFB, OH															

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	5.555		20.343		14.050		-		14.050	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0901410F / *Contracting Information Technology System*	**Project (Number/Name)** 643483 / *CON-IT*

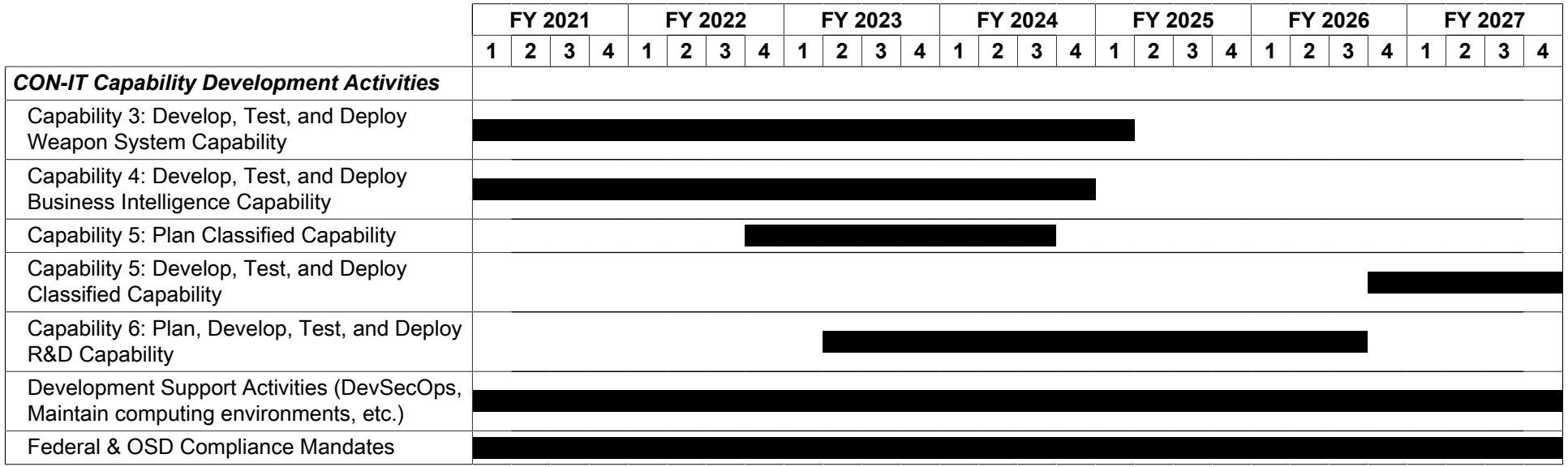

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0901410F / *Contracting Information Technology System*	**Project (Number/Name)** 643483 / *CON-IT*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
CON-IT Capability Development Activities				
Capability 3: Develop, Test, and Deploy Weapon System Capability	1	2021	1	2025
Capability 4: Develop, Test, and Deploy Business Intelligence Capability	1	2021	4	2024
Capability 5: Plan Classified Capability	4	2022	3	2024
Capability 5: Develop, Test, and Deploy Classified Capability	4	2026	4	2027
Capability 6: Plan, Develop, Test, and Deploy R&D Capability	2	2023	3	2026
Development Support Activities (DevSecOps, Maintain computing environments, etc.)	1	2021	4	2027
Federal & OSD Compliance Mandates	1	2021	4	2027

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 1206415F / *U.S. Space Command Research and Development Support*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	0.000	0.000	10.350	0.000	10.350	10.379	10.384	10.388	10.407	Continuing	Continuing
641234: *USSPACECOM Rapid Prototype Demonstration*	-	0.000	0.000	10.350	0.000	10.350	10.379	10.384	10.388	10.407	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 4, PE 1206415F, project 641234, Space Modeling, Simulation, and Analysis, is a new start.

A. Mission Description and Budget Item Justification

U.S. Space Command Research and Development support program integrates existing space-based capabilities from the Services and the Intelligence Community, overlaid with Commercial/Industry innovations, leveraging Joint Space rapid experimentation and demonstrations to build a comprehensive military advantage in Space. Promoting responsible behaviors in space, advocating for greater space capabilities, and collaborating with Industry partners are foundational to achieving National Space objectives. This shall be accomplished by accelerating technology demonstrations and rapid operational prototyping, plus assessing current and future space-based effects via model-based analysis. Such capabilities include but are not limited to; improved space battlespace awareness, to include use of commercial capabilities, joint fires to provide terrestrial near real-time targeting, Joint command and control, responsive launch/responsive space, and improvements of defensive space capabilities against an array of threats, resulting in confidence of assured space-based capabilities for the future fight. Capitalizing on Industry Innovations to develop future technical capabilities is vital to maintaining a competitive Space advantage. Moreover, this program supports the National Space Policy of the United States of America, "... to demonstrate United States leadership in space-related fora and activities to strengthen deterrence and assure allies and partnerships of its commitment to preserving the safety, stability, security, and long-term sustainability of space activities ... ".

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 1206415F / *U.S. Space Command Research and Development Support*	

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	10.350	0.000	10.350
Total Adjustments	0.000	0.000	10.350	0.000	10.350
• 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	10.350	0.000	10.350

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Space Modeling, Simulation, and Analysis	-	0.000	10.350	0.000	10.350

Description: Program models existing and potentially new space-based capabilities from the Services and the Intelligence Community, overlaid with Commercial/Industry innovations, leveraging Joint Space rapid experimentation and demonstrations to build a comprehensive military advantage in Space.

FY 2022 Plans:
N/A

FY 2023 Base Plans:
- Continue development of software and tools to model contested space
- Continue updates to software, tools, models, and data at the mission- and campaign-level to inform senior leaders evolving inquiries and decisions on space investments, requirements, acquisition, operational COAs, operational risk, and future planning
- Develop and modify user-friendly, front-end campaign-level and mission-level M&S software and tools supporting sufficiently accurate and very timely exploratory analytics to optimize operational planning, wargaming, and concepts
- Leverage model-based analysis of current and future space-based effects to effect technology demonstrations and rapid operational prototyping opportunities
- Capitalize on Industry Innovations to develop future technical capabilities via Accelerator/Incubator collaboration, derived from risk-reduction modeling of space effects

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 1206415F / *U.S. Space Command Research and Development Support*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
- In coordination with USSF /S9, continue assessing and integrating enterprise-level model data for MW, ISR, and SATCOM capabilities into campaign-level modeling - In coordination with DAF (Air Force Studies, Analysis, and Assessments), develop a schedule to identify requirements toward implementation of instantiation of space effects in a contested space environment - Support cost benefit analyses of Space Control activities with quantifiable impacts to warfighter operations ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A					
Accomplishments/Planned Programs Subtotals	-	0.000	10.350	0.000	10.350

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

Any new projects funded in this program will be awarded using competitive procedures to the maximum extent possible.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 1206415F / *U.S. Space Command Research and Development Support*	**Project (Number/Name)** 641234 / *USSPACECOM Rapid Prototype Demonstration*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development of software and tools to model contested space	Various	Not specified. : TBD	-	-		-		10.350	Oct 2022	-		10.350	Continuing	Continuing	-
		Subtotal	-	-		-		10.350		-		10.350	Continuing	Continuing	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		-		10.350		-		10.350	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 1206415F / *U.S. Space Command Research and Development Support*	**Project (Number/Name)** 641234 / *USSPACECOM Rapid Prototype Demonstration*

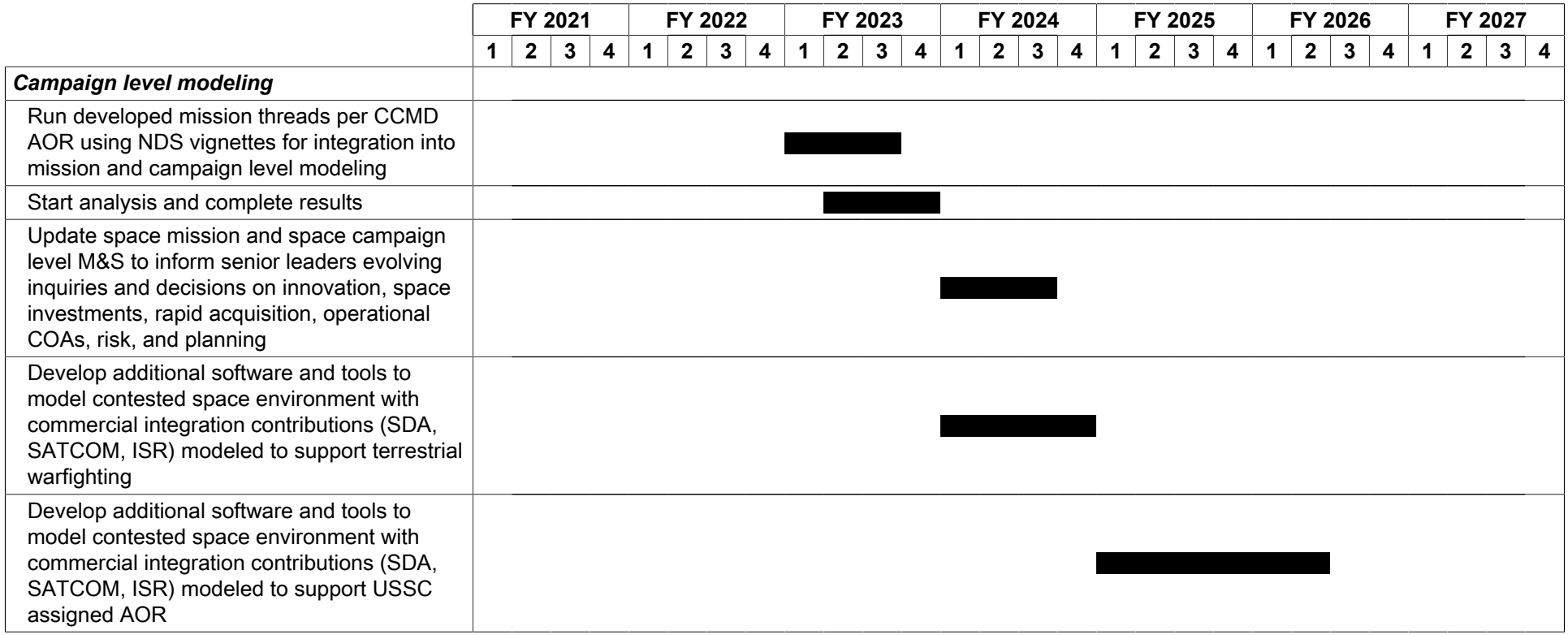

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 1206415F / *U.S. Space Command Research and Development Support*	**Project (Number/Name)** 641234 / *USSPACECOM Rapid Prototype Demonstration*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Campaign level modeling				
Run developed mission threads per CCMD AOR using NDS vignettes for integration into mission and campaign level modeling	1	2023	3	2023
Start analysis and complete results	2	2023	4	2023
Update space mission and space campaign level M&S to inform senior leaders evolving inquiries and decisions on innovation, space investments, rapid acquisition, operational COAs, risk, and planning	1	2024	3	2024
Develop additional software and tools to model contested space environment with commercial integration contributions (SDA, SATCOM, ISR) modeled to support terrestrial warfighting	1	2024	4	2024
Develop additional software and tools to model contested space environment with commercial integration contributions (SDA, SATCOM, ISR) modeled to support USSC assigned AOR	1	2025	2	2026

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604200F / *Future Advanced Weapon Analysis & Programs*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	22.478	18.499	9.879	0.000	9.879	9.735	9.653	36.459	250.749	0.000	357.452
653133: *Armament Subsystems*	-	22.478	18.499	9.879	0.000	9.879	9.735	9.653	36.459	250.749	0.000	357.452
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program enables Air Force level capability planning activities by supporting requirements generation and executing requirements/cost tradespace analysis. These classified and unclassified activities provide studies or responsive design and development engineering infrastructure to address emerging gaps and technology insertion/technology needs on legacy systems, and supports analysis to develop new capability systems, or determine feasibility by conducting prototypes with advanced technology. In addition, activities explore new concept development and analysis in response to stakeholder engagements, technology transitions, experimentation, fieldable demonstrations, and the delivery of quick reaction solutions. Efforts will identify methods to improve system performance, develop potential future designs, mitigate evolving threats, reduce life cycle costs, develop/expand modeling/simulation and experimental platforms for weapon qualification activities, improve safety, identify technology gaps, and ensure both viability and durability of future tactical weapon acquisition programs. Results enable highly informed decisions on acquisition initiatives to develop, refine, and rapidly integrate emerging technologies into new weapons concepts or existing aircraft munitions which include, but are not limited to, multi-role missile development, advanced long-range weapon capabilities, advanced propulsion systems technologies, non-kinetic and directed energy technologies, warheads, fuzes, and tailkits to address warfighter, Air Staff and OSD initiatives and strategies.

This program transitions innovative ideas and technologies to the warfighter via the execution of experimentation campaigns, flight demonstrations and rapid response technology deliveries. This program implements the Digital Acquisition tenants of Open, Agile, and Digital in support of all Air Force weapons. Conduct high fidelity Modeling, Simulation and Analysis (MS&A) to support the development, testing and evaluating of future concept and legacy weapons. The MS&A work includes physics-level, engineering-level, and engagement/mission-level modeling, simulation and analysis.

In order to accomplish the above objectives, this program may accomplish pre-acquisition planning and systems engineering, risk reducing prototype missile design work, aircraft integration, prototype ground & flight tests, pre-planning and execution of Joint Capability Technology Demonstrations (JCTD), development and prototyping of threat emulations, simulations, presentation of evolving threat scenarios, target area environments to prepare for emerging weapons development activities, maintenance of appropriate IT and security constructs and program management support.

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 0605831F. In FY21 $0 was expended for civilian pay expenses in this program element, and in FY22 $0 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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604200F / *Future Advanced Weapon Analysis & Programs*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	22.894	23.499	0.000	0.000	0.000
Current President's Budget	22.478	18.499	9.879	0.000	9.879
Total Adjustments	-0.416	-5.000	9.879	0.000	9.879
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-5.000			
• 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	-0.416	0.000			
• Other Adjustments	0.000	0.000	9.879	0.000	9.879

Change Summary Explanation

FY2022 Congressional reduction of $5M for Execution

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY 2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Capability Strategy Development	13.790	9.475	5.913	-	5.913
Description: Plans and executes early Systems Engineering, concept studies, trade space analyses, modeling & simulation, portfolio acquisition planning, agile acquisition strategies, and risk reduction activities for future advanced weapon systems to defeat evolving threat scenarios and environments. Provides security, workspace/ seating, and information technology capabilities to support mission needs. Collaborate with all program stakeholders to develop technical and investment strategies for future weapons.					
FY 2022 Plans: Conduct requirements analysis for Air Superiority, Global Precision Attack, and Base Defense efforts. Evaluate industry implementation of kinetic weapon open system architecture for a candidate initiative. Collaborate with OSD (R&E), Army, and Navy to develop a common directed energy weapon open system architecture. Begin Trade Space Analysis Framework to characterize operational context and desired material system attributes for					

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604200F / *Future Advanced Weapon Analysis & Programs*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
weapon related capability gaps. Provide weapon effectiveness analyses and capability development strategies to senior leaders for future weapons investment planning and wargames. ***FY 2023 Base Plans:*** Conduct experiments and demonstrations of kinetic and directed energy weapon concepts to prove feasibility and facilitate transition in air to air, long range strike, maritime strike and airbase defense mission areas. Evaluate industrial base implementation of agile acquisition initiatives like open systems architecture and digital engineering for future capabilities. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreased due to a re-prioritization of program requirements.					
Title: Rapid Prototyping ***Description:*** Enables the conduct of rapid acquisition/prototyping efforts and Modeling, Simulation, and Analysis (MS&A) validated through integration of empirical data derived from prototypes and demonstrations, while shaped by stakeholder engagements. ***FY 2022 Plans:*** Prototyping of Global Precision Attack and Base Defense weapon concepts to demonstrate feasibility of key attributes. Begin coordination of test planning with key MAJCOM and COCOM stakeholders. ***FY 2023 Base Plans:*** Prototyping weapon concepts to demonstrate feasibility of key attributes and initiate test planning with key stakeholders. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreased due to a re-prioritization of program requirements.	2.868	4.644	2.288	-	2.288
Title: Digital Foundation ***Description:*** Provides model-based systems engineering, modeling & simulation (M&S), data analysis tool suites, and associated software engineering expertise to support weapons capability strategy development and rapid prototyping. Provides Validation & Verification (V&V) of contractor M&S models and tools. Develops Guidance, Navigation, and Control (GNC) and weapon survivability analysis capabilities. Creates and maintains a searchable electronic weapons database. Develops and evaluates future weapon open system architectures and the employment of digital engineering tools to create future acquisition strategies.	2.911	2.378	0.539	-	0.539

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604200F / *Future Advanced Weapon Analysis & Programs*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
FY 2022 Plans: Maintain weapons analysis repository database. Continue updates to trade space analysis framework to enable online collaboration with other government agencies. Maintain developed digital foundation to support weapon capability strategy development. Conduct weapon lethality and survivability analyses. ***FY 2023 Base Plans:*** Conduct lethality analysis to support the development, testing, and evaluation of legacy and future weapon concepts. Work includes physics, engineering, engagement/mission level Modeling, Simulation and Analysis (MS&A) and efforts to characterize complex systems, provide independent analysis in mission areas such as long range strike. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreased due to a re-prioritization of program requirements.					
Title: Industry Connectivity ***Description:*** Enables Air Force outreach to small and large businesses to solicit innovative material solutions for future weapon initiatives. This includes planning and execution activities for the development of campaign analysis, rapid innovation events, communicating technology needs at industry conferences (i.e. Weapons Conference, Air Force Association Symposium), and evaluating industry submissions for innovative technologies. Demonstrate potential utility of innovative technologies from Small Business Innovation Research (SBIR) contracts, campaign analyses, experiments, and prototypes. Ensure alignment of S&T activities, acquisition efforts, and warfighter requirements for air-delivered munitions with Air Force, government, and industry stakeholders. ***FY 2022 Plans:*** Conduct annual AF Armament Futures Workshop, Innovation and Industry Day events for small and large businesses, and Threat Day. Develop future agendas based on participant feedback and informed by capability strategy development weapons roadmap activities. ***FY 2023 Base Plans:*** Demonstrate utility of innovative technologies for Small Business Innovation Research (SBIR) contracts, campaign analysis and experiments, as well as management of the digital outreach required to meet these objectives. Examine how new digital acquisition programs can meet air to air, long range strike, maritime strike	2.909	2.002	1.139	0.000	1.139

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604200F / *Future Advanced Weapon Analysis & Programs*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
and airbase defense mission areas to fulfill urgent warfighter requirements focusing on network collaborative autonomous, guidance and control, test and training, and direct attack. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreased due to a re-prioritization of program requirements.					
Accomplishments/Planned Programs Subtotals	22.478	18.499	9.879	0.000	9.879

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

Accomplish studies, analyses, concept development and engineering; efforts will be conducted using contracting strategies deemed most appropriate, generally using competitive contracts.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604200F / *Future Advanced Weapon Analysis & Programs*	**Project (Number/Name)** 653133 / *Armament Subsystems*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Directed Energy Studies	MIPR	AFRL : Various	-	0.400	Jul 2021	0.000		0.000		-		0.000	0.000	0.400	-
Prototype Vehicle Development & Integration	C/Various	AFLCMC/EB : Eglin AFB, FL	-	1.261	May 2022	0.000	Jul 2022	1.051	Mar 2023	-		1.051	0.000	2.312	-
Affordable Mass & Concept Studies	C/TBD	TBD : TBD	-	0.430	Aug 2021	2.819	May 2022	3.966	Nov 2022	-		3.966	Continuing	Continuing	-
Future Weapons Open System Architecture	TBD	TBD : Various	-	1.201	Apr 2021	6.512	Mar 2022	0.250	Dec 2022	-		0.250	Continuing	Continuing	-
		Subtotal	-	3.292		9.331		5.267		-		5.267	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering & Studies Support	C/Various	AFLCMC/EB : Eglin AFB, FL	-	8.250	Jun 2021	2.802	Apr 2022	0.625	Dec 2022	-		0.625	0.000	11.677	-
Modeling & Simulation Licenses & Support	C/Various	AFLCMC/EB : Eglin AFB, FL	-	0.513	May 2021	0.350	Apr 2022	0.178	Nov 2022	-		0.178	0.000	1.041	-
		Subtotal	-	8.763		3.152		0.803		-		0.803	0.000	12.718	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Test and Evaluation	MIPR	Various : Various	-	3.995	Apr 2021	0.000	Feb 2022	0.000		-		0.000	0.000	3.995	-
		Subtotal	-	3.995		0.000		0.000		-		0.000	0.000	3.995	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604200F / *Future Advanced Weapon Analysis & Programs*	**Project (Number/Name)** 653133 / *Armament Subsystems*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Program Management Administration	Various	Various : Eglin AFB, FL	-	6.428	Dec 2020	6.016	May 2022	3.809	May 2023	-		3.809	0.000	16.253	-
		Subtotal	-	6.428		6.016		3.809		-		3.809	0.000	16.253	N/A

Remarks

Includes A&AS contract, IT requirements, travel, and office supplies.

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	22.478		18.499		9.879		-		9.879	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604200F / *Future Advanced Weapon Analysis & Programs*	**Project (Number/Name)** 653133 / *Armament Subsystems*

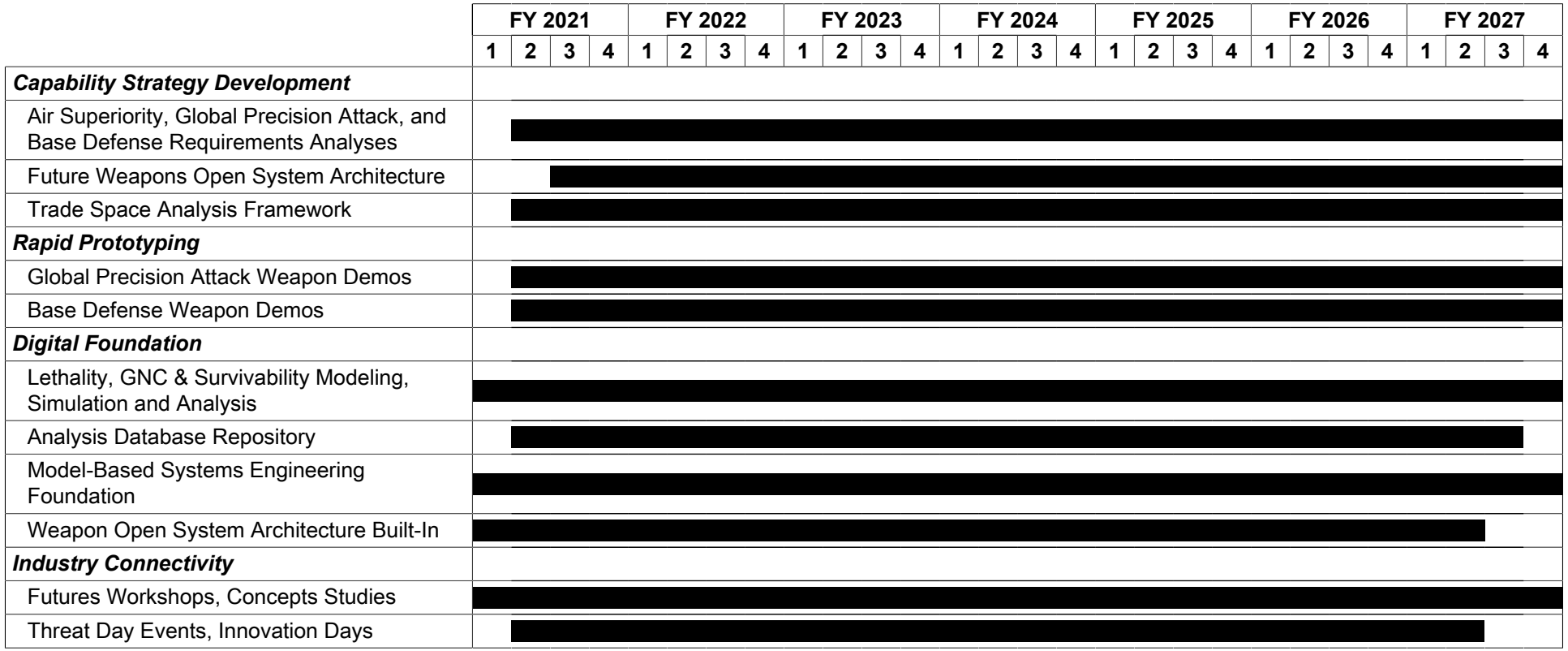

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604200F / *Future Advanced Weapon Analysis & Programs*	**Project (Number/Name)** 653133 / *Armament Subsystems*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Capability Strategy Development				
Air Superiority, Global Precision Attack, and Base Defense Requirements Analyses	2	2021	4	2027
Future Weapons Open System Architecture	3	2021	4	2027
Trade Space Analysis Framework	2	2021	4	2027
Rapid Prototyping				
Global Precision Attack Weapon Demos	2	2021	4	2027
Base Defense Weapon Demos	2	2021	4	2027
Digital Foundation				
Lethality, GNC & Survivability Modeling, Simulation and Analysis	1	2021	4	2027
Analysis Database Repository	2	2021	3	2027
Model-Based Systems Engineering Foundation	1	2021	4	2027
Weapon Open System Architecture Built-In	1	2021	2	2027
Industry Connectivity				
Futures Workshops, Concepts Studies	1	2021	4	2027
Threat Day Events, Innovation Days	2	2021	2	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604201F / *PNT Resiliency, Mods, and Improvements*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	37.409	163.520	176.824	0.000	176.824	182.497	216.003	125.173	84.849	0.000	986.275
651030: *GPS Receiver Development*	-	37.409	163.520	176.824	0.000	176.824	182.497	216.003	125.173	84.849	0.000	986.275
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Positioning, Navigation, and Timing (PNT) solutions are critical to defense operations, enabling delivery of precision fires, safe aerial navigation, and time coordination across multiple platforms and subsystems. PNT must be maintained in the face of emerging and continuously evolving electronic and cyber threats, requiring increased system resiliency and rapid adaptability similar to that historically required of electronic warfare systems. Evolving threats will drive upgrades such as Global Positioning System (GPS) receiver modernization, development of standard navigational system formats/interfaces, increased use of open system architecture design principles, incorporation of alternative navigation sources into navigational solutions, advanced anti-jam antennas, antenna electronics, radio frequency monitoring/locating/ reporting capabilities, and precision clock improvements to maintain current and future force capabilities.

Project 651030 includes Embedded GPS/Inertial Navigation System (INS) Modernized (EGI-M), Miniaturized Airborne GPS Receiver 2000 Modernization (MAGR-2K-M), Resilient GPS (R-EGI) development, anti-jam antenna/antenna electronics development, situational awareness devices, and other advanced/non-GPS PNT solutions. Activities also include, but are not limited to, current program planning, rapid prototyping/concept development, execution and future program planning and support to other GPS enabled systems as required. The PNT Resiliency, Mods, and Improvements (RMI) effort provides rapidly re-programmable application space for Alternate Satellite Navigation Systems User Equipment (UE), enabling agile and resilient response to GPS threat environments. Funds may be used to address emerging and short-notice Diminishing Manufacturing and Material Shortage (DMSMS) issues.

This requirement supports performance of a full financial audit as required by title 10 U.S.C. Chapter 9A, Sec 240-D.

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. In FY21 $0.721M was expended for civilian pay expenses in this program element and in FY22 $2.643M is forecasted for civilian pay expenses in this program element.

The total cost of the R-EGI Middle Tier of Acquisition effort is $167.7M, including RDT&E and procurement of prototype units. The R-EGI 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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604201F / *PNT Resiliency, Mods, and Improvements*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	38.494	167.520	0.000	0.000	0.000
Current President's Budget	37.409	163.520	176.824	0.000	176.824
Total Adjustments	-1.085	-4.000	176.824	0.000	176.824
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-4.000			
• 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	-1.085	0.000	176.824	0.000	176.824

Change Summary Explanation

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY 2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Embedded GPS/INS - Modernized (EGI-M)	16.940	101.139	59.324

Description: EGI-M is a combined INS/GPS aircraft position, navigation, and timing system. Program upgrades EGI design to enhance resiliency against existing and emerging navigational warfare threats, incorporating design features (such as interface standardization and software modularity) to incorporate alternative navigation and timing sources, where cost effective, to reduce DoD cost and time lines to respond to newly identified threats and maintain current force capabilities. Incorporates M-Code and Automatic Dependent Surveillance-Broadcast (ADS-B) compliance capability into EGI receivers while addressing parts obsolescence, reducing configuration count from 260+ to a desired end-state of 16, and decreasing production and sustainment costs.

EGI-M has two prime contractors: Northrop Grumman and Honeywell.

FY 2022 Plans:

Reestablish schedules following updated MGUE delivery dates and design changes. Continue production of Northrop Grumman Engineering Development Models (EDM) and conduct Test Readiness Review. Continue production of EDMs for the Honeywell design.

FY 2023 Plans:

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604201F / *PNT Resiliency, Mods, and Improvements*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Continue development and test of Production Representative Units (PRU), from both suppliers, for delivery to Lead aircraft platforms in support of aircraft operational test. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreased due to updates in the re-baselined PRU delivery schedule.			
Title: Miniaturized Airborne GPS Receiver 2000 - Modernized (MAGR-2K-M) ***Description:*** MAGR-2K-M is an aircraft GPS receiver. Program increases MAGR-2K-Legacy resiliency against existing and emerging navigational warfare threats while reducing cost and timelines to incorporate agile capabilities to respond to newly identified threats. Incorporates M-Code capability into MAGR-2K-Legacy receivers while addressing parts obsolescence and providing a pathway to ADS-B Out implementation. Performs appropriate trade studies and incorporates additional resiliency features, such as alternate navigation inputs, where cost effective. The Air Force and the Navy are the primary users of the MAGR-2K-M system. ***FY 2022 Plans:*** Integrate Military GPS User Equipment (MGUE) software builds 6.2 and 6.3. Conduct anomaly resolution. Deliver balance of PRUs and upgrade previously delivered Production Representative Units (PRUs) to latest configuration. Initiate performance qualification testing, cyber testing, and developmental testing. ***FY 2023 Plans:*** Conduct testing and problem resolution of any issues that may arise from Lead Platform testing. Prepare artifacts to acquire Program Executive Officer (PEO) certification (Milestone C), which enables platforms to procure MAGR-2K-M units for fielding. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increased due to further schedule changes in MGUE and an increased number of MGUE Software drops required to incorporate and test.	1.858	12.464	15.500
Title: PNT Resiliency, Mods, and Improvements (RMI) ***Description:*** Conduct studies and analysis of PNT systems and requirements, develop and evaluate alternative courses of action, identify, plan and conduct PNT technology transition projects, conduct prototype and acquisition program planning, and provide recommended solutions to DoD and Air Force decision makers relative to navigation warfare threat evolution and technology emergence. This includes work for more flexible Secure Software Defined Receiver User Equipment (to include, but not limited to, developing an associated antenna electronics capability) to capture other than GPS signals like Multi-Global Navigation Satellite Systems to include Navigation Technology Satellite-III. ***FY 2022 Plans:***	0.352	1.195	2.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604201F / *PNT Resiliency, Mods, and Improvements*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Conduct studies and analysis of PNT systems and requirements. Supports the acceleration and risk reduction efforts for Secure Software Defined Receiver User Equipment. Accommodates evaluation of existing systems. Development / documentation of external & internal interface design requirements. ***FY 2023 Plans:*** Conduct studies and analysis of PNT systems and requirements. Supports risk reduction efforts to transition Alternative Navigation technologies into DoD PNT systems. Accommodates evaluation of existing systems. Development / documentation of external and internal interface design requirements. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increased due to acceleration of risk reduction efforts for Secure Software Defined Receiver User Equipment requirement.			
Title: Resilient EGI (R-EGI) ***Description:*** Establishes a Government Reference Architecture (GRA) embodying open systems architecture concepts, enabling and accelerating the transition of future resilient PNT DoD systems. Enables design and development of various aircraft PNT Line Replaceable Units (LRUs) that are rapidly upgradeable to counter evolving threats. Demonstrates the GRA through prototyping of an open R-EGI LRU. Program matures, prototypes, and tests promising PNT technologies/systems and develops transition paths to flow new technologies into new and/or existing PNT systems. Provides improved PNT resiliency to counter navigational warfare threats through the design, development, test, and transition of science and technology efforts to PNT systems. ***FY 2022 Plans:*** Complete detailed design spiral and produce the Detailed Design Prototype to allow initial integration into developmental testing labs and integration into platform labs. Build on knowledge gained through use of the Detailed Design Prototype in the final design spiral and secure long-lead parts for Production Representative Prototypes. Continue efforts to establish Government owned virtual Software Integration Lab for sustainment and follow on development of the R-EGI system. ***FY 2023 Plans:*** Complete Final Design Review for R-EGI development effort and produce Production Representative Prototypes. Execute Test Readiness Review, Cyber Testing, Developmental Testing, and integration into platform labs on the Production Representative Prototypes as verification of the R-EGI LRU in preparation of Qualification Testing on Lead Platform test assets. Initiate development of additional R-EGI form factor and begin early platform integration/requirement alignment of Mission Design Series (MDS) to accept new form factor. Transition to establishment of production follow-on contract. ***FY 2022 to FY 2023 Increase/Decrease Statement:***	18.259	48.722	51.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604201F / *PNT Resiliency, Mods, and Improvements*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Funding increased due to R-EGI additional form factor/platform on-ramping funding being approved in FY 2023.			
Title: Software Defined User Equipment	-	0.000	49.000
Description: SDUE will develop a Software Defined Receiver (SDR) hosted on a Commercial Off-the-Shelf (COTS) Field Programmable Gate Array (FPGA) delivering an M-Code GNSS receiver prototype with agile reprogramming capability to provide robust, resilient PNT against navigational warfare (NAVWAR) and cyber threats with a government owned technical baseline. SDUE will also develop an associated antenna electronics capability utilizing COTS FPGA equipment to support the ingest of new satellite signals/capabilities and assist in handling these signals in a software reprogrammable environment. The Global Navigation Satellite System (GNSS) receiver and antenna electronics will interface directly with REGI via open standards. SDUE is part of the larger Navigation Technology Satellite (NTS)-3 Air Force Vanguard effort. SDUE supports and is an enabler for the Secretary of the Air Force (SECAF) Operational Effectiveness Imperative (OEI) #1. ***FY 2022 Plans:*** N/A. Program not funded in FY22. ***FY 2023 Plans:*** Establish a Program Office and begin acquiring requisite manpower. Initiate a Middle Tier Acquisition program utilizing an Other Transaction Authority (OTA) and select a Design Team. Have the Design Team begin work on a preliminary design with the intent of holding a Preliminary Design Review (PDR) 9-months after contract award (i.e., early FY24). Begin development of Digital Engineering artifacts and data gathering to support PDR decision making. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increased due to program funding starting in FY23.			
Accomplishments/Planned Programs Subtotals	37.409	163.520	176.824

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

Modify and modernize existing legacy PNT systems to incorporate major enhancements such as GPS M-Code, ADS-B out, and alternative PNT solutions to GPS while reducing lifecycle costs through common sustainment practices and economies of scale. Design, development, and testing efforts, to include the development of government owned reference architectures for rapid capability insertion, share a common PE to allow flexibility in funding and planning. Integration and operational testing of completed PNT solutions are accomplished by individual platforms and weapons systems. This approach uses a combination of cost-plus and fixed-price contract types based on acquisition phase and risk with a mix between competition and sole-source strategies. Modifications to legacy receivers are acquired via

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604201F / *PNT Resiliency, Mods, and Improvements*

Engineering Change Proposals (ECP)/Task Orders on existing contracts. Other Transaction Authorities (OTA) and industry consortiums are used to support prototyping and open standards development for new PNT solutions.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604201F / *PNT Resiliency, Mods, and Improvements*	**Project (Number/Name)** 651030 / *GPS Receiver Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
EGI-M #1 EMD	C/CPAF	Honeywell : Clearwater, FL	-	4.663	Sep 2021	37.809	Apr 2022	18.938	Nov 2022	-		18.938	Continuing	Continuing	-
EGI-M #2 EMD	SS/CPFF	Northrop Grumman : Woodland Hills, CA	-	10.139	Sep 2021	51.744	Apr 2022	32.719	Nov 2022	-		32.719	Continuing	Continuing	-
MAGR-2K-M	SS/CPFF	Raytheon : El Segundo, CA	-	4.858	Mar 2021	11.214	Apr 2022	12.600	Oct 2022	-		12.600	Continuing	Continuing	-
PNT RMI	SS/CPFF	Collins Aerospace : Des Moines, IA	-	-		1.200	May 2022	4.800	Mar 2023	-		4.800	Continuing	Continuing	-
R-EGI	C/CPFF	IS4S : Huntsville, AL	-	12.635	Apr 2021	42.463	Apr 2022	3.750	Jan 2023	-		3.750	Continuing	Continuing	-
R-EGI Modernization & Additional Platforms	C/CPFF	TBD : TBD	-	-		-		37.900	Mar 2023	-		37.900	Continuing	Continuing	-
SDUE	TBD	Not specified. : TBD	-	-		2.000	Jun 2022	35.890	May 2023	-		35.890	Continuing	Continuing	-
		Subtotal	-	32.295		146.430		146.597		-		146.597	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
EGI-M FFRDC	Various	MITRE Corp. : Bedford, MA	-	-		1.300	Nov 2021	0.263	Nov 2022	-		0.263	Continuing	Continuing	-
R-EGI FFRDC	Various	MITRE Corp. : Bedford, MA	-	1.851	Mar 2021	0.624	Nov 2021	1.750	Nov 2022	-		1.750	Continuing	Continuing	-
SDUE FFRDC	Various	MITRE Corp : Bedford, MA	-	0.381	Apr 2021	-		6.150	May 2023	-		6.150	Continuing	Continuing	-
DCA Civ Pay	Allot	Allotment : Robins AFB, GA	-	-		2.643	Apr 2022	2.731	Jan 2023	-		2.731	Continuing	Continuing	-
		Subtotal	-	2.232		4.567		10.894		-		10.894	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604201F / *PNT Resiliency, Mods, and Improvements*	**Project (Number/Name)** 651030 / *GPS Receiver Development*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
EGI-M	PO	Various : TBD	-	-		0.500	Apr 2022	0.500	Nov 2022	-		0.500	Continuing	Continuing	-
MAGR-2K-M	PO	Various : TBD	-	-		1.250	Jun 2022	0.900	Jun 2023	-		0.900	Continuing	Continuing	-
R-EGI	PO	Various : TBD	-	0.270	Mar 2021	0.750	Apr 2022	1.000	Dec 2022	-		1.000	Continuing	Continuing	-
R-EGI Modernization & Additional Platforms	Various	Various : TBD	-	-		-		1.000	Mar 2023	-		1.000	Continuing	Continuing	-
SDUE	TBD	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-
		Subtotal	-	0.270		2.500		3.400		-		3.400	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Strategic Planning/PMA	C/Various	Whitney, Bradley & Brown : Robins AFB, GA	-	2.612	Oct 2020	10.023	Oct 2021	15.933	Oct 2022	-		15.933	Continuing	Continuing	-
		Subtotal	-	2.612		10.023		15.933		-		15.933	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	37.409		163.520		176.824		-		176.824	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604201F / *PNT Resiliency, Mods, and Improvements*	**Project (Number/Name)** 651030 / *GPS Receiver Development*

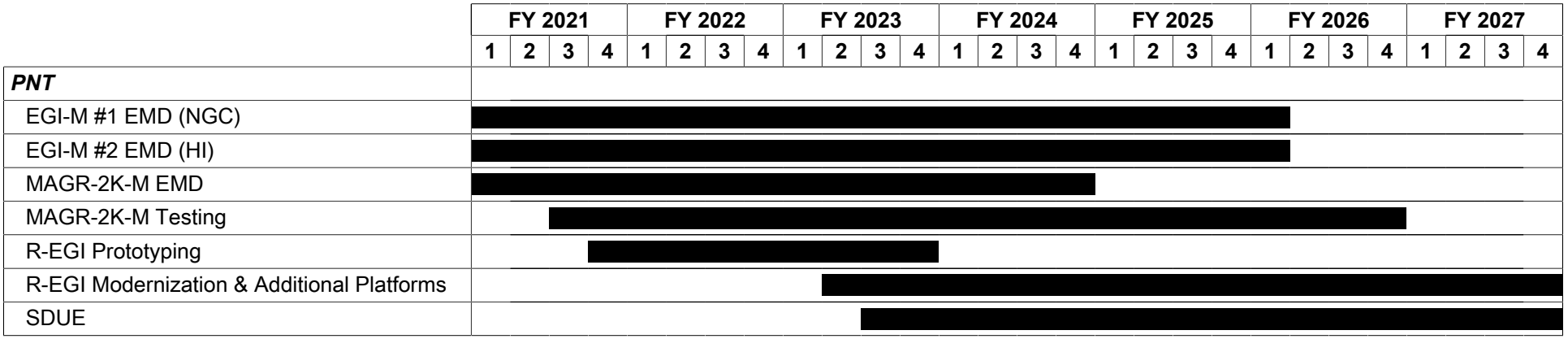

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604201F / *PNT Resiliency, Mods, and Improvements*	**Project (Number/Name)** 651030 / *GPS Receiver Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
PNT				
EGI-M #1 EMD (NGC)	1	2021	1	2026
EGI-M #2 EMD (HI)	1	2021	1	2026
MAGR-2K-M EMD	1	2021	4	2024
MAGR-2K-M Testing	3	2021	4	2026
R-EGI Prototyping	4	2021	4	2023
R-EGI Modernization & Additional Platforms	2	2023	4	2027
SDUE	3	2023	4	2027

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604222F / *Nuclear Weapons Support*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	24.502	30.050	64.425	0.000	64.425	39.967	40.621	43.254	45.960	Continuing	Continuing
654236: *Engineering Analysis*	-	4.254	4.531	0.994	0.000	0.994	4.509	2.636	2.692	2.752	Continuing	Continuing
654807: *Nuclear Weapon System Technology and Integration*	-	14.169	19.474	61.411	0.000	61.411	33.396	35.885	38.418	41.016	Continuing	Continuing
655708: *Nuclear Weapons Support*	-	6.079	6.045	2.020	0.000	2.020	2.062	2.100	2.144	2.192	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Air Force Nuclear Weapons Center (AFNWC), Kirtland AFB, NM, is the primary executing agency for this program. The AFNWC is tasked with maintaining and providing technical expertise on all Air Force (AF) nuclear weapons and weapon systems. This program provides resources for technical and programmatic activities, which includes research, development, test, and evaluation of all nuclear-certified equipment/systems, as well as performing independent capability analyses on all AF nuclear weapon systems activities, including weapons development and sustainment; interoperability; compatibility; safety, security, and reliability; and nuclear stockpile certification management for legacy and modernized AF nuclear weapon systems.

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 FY21 $0M was expended for civilian pay expenses in this program element, and in FY22 $0M 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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force					Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0604222F / *Nuclear Weapons Support*		
B. Program Change Summary ($ in Millions)	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**
Previous President's Budget	26.057	30.050	0.000	0.000	0.000
Current President's Budget	24.502	30.050	64.425	0.000	64.425
Total Adjustments	-1.555	0.000	64.425	0.000	64.425
• 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	-0.635	0.000			
• SBIR/STTR Transfer	-0.920	0.000			
• Other Adjustments	0.000	0.000	64.425	0.000	64.425

Change Summary Explanation

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

$0.635M was transferred from project 655708 in the FY21 Omnibus.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604222F / *Nuclear Weapons Support*	Project (Number/Name) 654236 / *Engineering Analysis*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
654236: *Engineering Analysis*	-	4.254	4.531	0.994	0.000	0.994	4.509	2.636	2.692	2.752	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The AFNWC is the executing agency for the Engineering Analysis program that provides and maintains technical expertise on all AF nuclear weapons and weapon systems and conducts mission-level cyber risk analysis, integrates cybersecurity into systems engineering processes, enhances adaptability and agility via application of modular designs and approaches, develops cyber-savvy workforce, increases assurance in fielded systems in a cost effective and efficient manner, increases the integration of cyber intelligence and enables cyber operation flights and cyber protection teams. This program provides resources for technical and programmatic activities which include performing independent analyses on all AF nuclear weapons systems activities including weapons development and sustainment; interoperability; compatibility; training; safety, security, and reliability; and Air Force legacy nuclear stockpile management/retirement. The AFNWC will partner with external agencies to achieve cross cutting solutions to mitigate cyber vulnerabilities. The implementation of Digital Engineering and development of Model Based System Engineering will facilitate the testing, analysis and timely delivery of nuclear weapons systems.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Engineering Analysis	4.254	4.531	0.994
Description: Provide the technical oversight of all AF nuclear weapons, delivery systems, and support systems. Provide the engineering and technical management expertise required in critical areas of nuclear weapons safety, security, reliability, operations, modernization, testing, and counterproliferation. ***FY 2022 Plans:*** Analyze and document nuclear weapons issues related to risk assessment, data collection, model development, model validation and verification, weapon effectiveness, and nuclear stockpile planning and requirements assessment. ***FY 2023 Plans:*** Continue to analyze and document nuclear weapons issues related to risk assessment, data collection, model development, model validation and verification, weapon effectiveness, and nuclear stockpile planning and requirements assessment. Add nuclear command, control, and communications (NC3) systems to this effort. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding reduced due to reduction in Cybersecurity Vulnerability Analysis work in FY23 and completion of the Aerospace SMIC Emulation effort in FY22.			
Accomplishments/Planned Programs Subtotals	4.254	4.531	0.994

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604222F / *Nuclear Weapons Support*	**Project (Number/Name)** 654236 / *Engineering Analysis*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Cost Plus Award Fee (CPAF) and Military Interdepartmental Purchase Request (MIPR) will be used to obtain technical analyses and technical support for safety, operations, and counter proliferation assessments. Supporting activities are contracted separately using contract strategies deemed most appropriate to the effort. All contracts will be openly competed.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604222F / *Nuclear Weapons Support*	Project (Number/Name) 654236 / *Engineering Analysis*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Federally Funded Research and Development Center (FFRDC) Cybersecurity Vulnerability Analysis	MIPR	AEROSPACE : Kirtland AFB, NM	-	0.600	Nov 2020	0.610	Nov 2021	0.020	Nov 2022	-		0.020	Continuing	Continuing	-
FFRDC Emulation of the Strategic Missile Integration Complex (SMIC)	MIPR	AEROSPACE : Kirtland AFB, NM	-	1.200	Feb 2021	1.250	Apr 2022	-		-		-	0.000	2.450	-
		Subtotal	-	1.800		1.860		0.020		-		0.020	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Secure Cyber Facility Support	MIPR	Various : Kirtland AFB, NM	-	0.400	Nov 2020	0.513	Apr 2022	-		-		-	0.000	0.913	-
Mission Support	MIPR	AEROSPACE : Kirtland AFB, NM	-	0.800	Feb 2021	0.900	Apr 2022	0.114	Apr 2023	-		0.114	Continuing	Continuing	-
Model Based Systems Engineering (MBSE)	MIPR	AEROSPACE : Kirtland AFB, NM	-	0.454	Feb 2021	0.458	Apr 2022	-		-		-	0.000	0.912	-
Digital Systems Engineering	MIPR	Various : Kirtland AFB, NM	-	-		-		0.860	Jun 2023	-		0.860	Continuing	Continuing	-
		Subtotal	-	1.654		1.871		0.974		-		0.974	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Support A&AS	Various	Various : Kirtland AFB, NM	-	0.600	Feb 2021	0.600	Apr 2022	-		-		-	0.000	1.200	-
Program Management Support (PSC)	Various	Various : Kirtland AFB, NM	-	0.200	Mar 2021	0.200	Apr 2022	-		-		-	0.000	0.400	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604222F / *Nuclear Weapons Support*	Project (Number/Name) 654236 / *Engineering Analysis*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	0.800		0.800		-		-		-	0.000	1.600	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	4.254		4.531		0.994		-		0.994	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604222F / *Nuclear Weapons Support*	**Project (Number/Name)** 654236 / *Engineering Analysis*

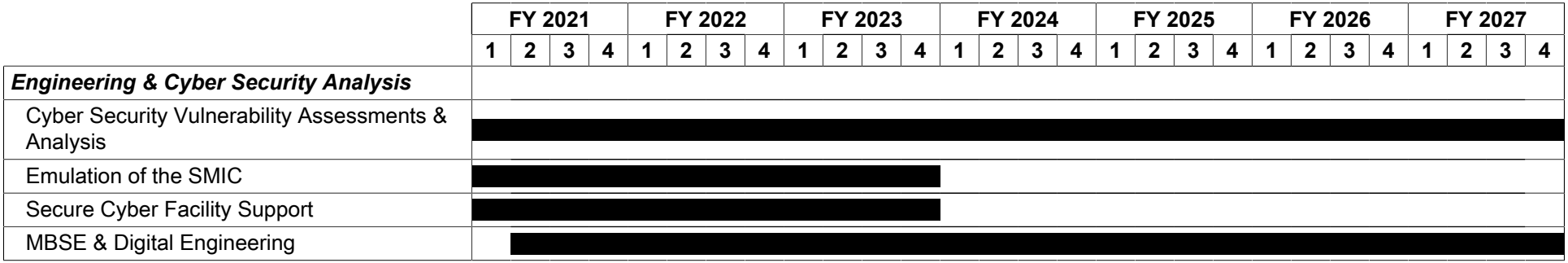

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604222F / *Nuclear Weapons Support*	**Project (Number/Name)** 654236 / *Engineering Analysis*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Engineering & Cyber Security Analysis				
Cyber Security Vulnerability Assessments & Analysis	1	2021	4	2027
Emulation of the SMIC	1	2021	4	2023
Secure Cyber Facility Support	1	2021	4	2023
MBSE & Digital Engineering	2	2021	4	2027

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604222F / *Nuclear Weapons Support*	Project (Number/Name) 654807 / *Nuclear Weapon System Technology and Integration*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
654807: *Nuclear Weapon System Technology and Integration*	-	14.169	19.474	61.411	0.000	61.411	33.396	35.885	38.418	41.016	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The AFNWC is the executing agency for the Nuclear Weapon System Technology and Integration (NWST&I) program that ensures the safety, survivability, security, and reliability of AF nuclear weapon systems in direct support to the military warfighters and force providers. Emphasis is placed on independent technical assessments in support of nuclear compatibility, nuclear safety design, technical orders, and weapon system safety rules. Also provides assurance of survivability and mitigation of vulnerabilities to these unique systems. These requirements are met through studies and analyses, demonstration, modeling and simulation (M&S), test and evaluation (T&E), trade studies, requirements analysis, and recommendations to planning, policy, and doctrine. This program also conducts DoD-required certification for legacy, modernized, and new nuclear weapon systems. Starting in FY23, this program consolidates funding for DoD-required certification for legacy, modernized, and new nuclear weapon systems.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Weapons Effects	3.587	6.174	6.282
Description: Ensures survivable and effective AF systems through evaluation, test, and analyses of nuclear environments and their impact to AF platforms. Develops and maintains the sole AF analytical capability to assess nuclear effects on weapon systems, their inherent hardness and mission degradation within a nuclear environment. These efforts shape and support requirements for new acquisitions, fielded systems, as well as providing critical expertise for exercises and operational planning.			
FY 2022 Plans: Develop, modernize, and conduct verification and validation of M&S tools and testing methods. Develop rigorous methods and tools for testing and predictive response to nuclear effects. Establish hardness requirements within the weapon system specification for current and future delivery aircraft, support aircraft, weapon systems, Intercontinental Ballistic Missiles (ICBMs), and nuclear command, control, and communications (NC3) assets. Develop methods and tools used to assure weapon effectiveness in operationally relevant environments. Support AF Global Strike Command (AFGSC) through oversight and report standardization of AF aircraft electromagnetic pulse (EMP) threat-level test execution.			
FY 2023 Plans: Continue to increase development, modernization, verification and validation of M&S tools and testing methods. Continue to develop rigorous methods and tools for testing and predictive response to nuclear effects. Continue to increase analysis to establish hardness requirements within the weapon system specification for current and future delivery aircraft, support aircraft,			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604222F / *Nuclear Weapons Support*	**Project (Number/Name)** 654807 / *Nuclear Weapon System Technology and Integration*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
weapon systems, ICBM, and NC3 assets. Continue to expand development of methods and tools used to assure weapon effectiveness in operationally relevant environments. Continue to support AFGSC through oversight and report standardization of AF aircraft EMP threat-level test execution. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increased due to marginal increase of existing lines of effort and inflation adjustments.			
Title: Air Force Nuclear Red Team (AFNRT) ***Description:*** The AFNRT independently evaluates vulnerabilities of current and future strategic systems across their lifecycle vs near term and emerging threats. These strategic systems capability assessments include nuclear weapon system fragility analysis, vulnerability modes & effects analysis, M&S, and effects testing. As part of the effort to assess the vulnerabilities, data is used from various tests and M&S tools to develop mitigation strategies for consideration by program offices. This analysis of various threats to AF nuclear weapon systems is used to inform the warfighter's concept of operations (CONOPS), modernization activities, and new acquisitions. ***FY 2022 Plans:*** Assess strategic system capabilities/vulnerabilities relative to Air-Delivered (AD) nuclear weapon systems, Intercontinental Ballistic Missiles (ICBMs), and Human Factors (HF) related to strategic systems. Evaluate current and future threats that include, but not limited to, kinetic, electronic warfare, cyber, supply chain, maintenance/logistics, and human factor vulnerabilities. Assessments include nuclear weapon systems fragility analysis, vulnerability modes and effects analysis, M&S and combined environment testing. Assessments are evaluated using existing weapon/platform paired with current and emerging threat vectors, as well as proposed modernization requirements. AD, ICBM, and HF assessments are used in the development of requirements, CONOPS, and tactics, techniques, and procedures (TTPs) for modernization activities and new acquisitions. ***FY 2023 Plans:*** Continue expanded assessments of strategic system capabilities/vulnerabilities relative to AD nuclear weapon systems, ICBMs, and HFs related to strategic systems. Continue threat evaluations and analyses to address current and future threats that include, but are not limited to, kinetic, electronic warfare, cyber, supply chain, maintenance/logistics, and human factor vulnerabilities. Assessments will include nuclear weapon system fragility analysis, vulnerability modes and effects analysis, M&S and combined environment testing. Assessments will be evaluated using existing weapon/platform paired with current and emerging threat vectors, as well as proposed modernization requirements. AD, ICBM, NC3, and HF assessments will be used in the development of requirements, CONOPS, and TTPs for modernization activities, and new acquisitions. ***FY 2022 to FY 2023 Increase/Decrease Statement:***	10.582	13.300	13.537

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604222F / *Nuclear Weapons Support*	**Project (Number/Name)** 654807 / *Nuclear Weapon System Technology and Integration*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Funding increased due to marginal increase of existing lines of effort and inflation adjustments.			
Title: Nuclear Certification Management	0.000	0.000	41.592
Description: This effort continues nuclear certification activities and development of nuclear certification tools that were previously contained in this program element, under project 654236, Engineering Analysis, prior to FY23. This funding is nuclear enterprise-wide, and required for the independent analysis roles, responsibilities, and authorities (RRA) directed by statutory (USC) and regulatory (DoDM and AFI) for the AFNWC; it is distinct from, but complemented by the funding identified by specific nuclear weapons programs (e.g., B-21, Ground Based Strategic Deterrent (GBSD), F-35A, F-15E, etc.) for their RRA in nuclear certification, as segregated and directed by the same regulations (DODM 5210.41M and AFI 63-125). By DoD mandate, AFNWC provides an external (independent of Program Offices) review of a weapon system's nuclear safety and surety features, eventually certifying the weapon system and its operational employment procedures. Nuclear certification activities include independent AF technical reviews, evaluations, and analyses for nuclear safety themes, employment procedures, delivery systems (warhead and/or carrier platforms, subsystems, or components), support equipment, software, and facilities that handle, maintain, or operate nuclear weapons or nuclear weapon systems to ensure compliance with National, DoD and AF guidance. AFNWC's scope includes overall management of the entire nuclear certification process for the AF; as well as the execution of compatibility certification, nuclear safety design, weapon system safety rules, and technical orders, and functions (e.g., security) involving personnel and organizations assigned to perform nuclear missions. The objective of this project is focused on new nuclear weapon system acquisition programs, and fielded system sustainment, modifications, and upgrades. This project will manage the flow of nuclear certification activities and provide certification data to all stakeholders via the Nuclear Certification Analysis Tool (NCAT). Examples include certification requirements plans, Aircraft Monitor and Control (AMAC) certification, surveillance testing, consequence analyses, qualitative and quantitative hazard evaluations, and myriad other activities. ***FY 2022 Plans:*** N/A ***FY 2023 Plans:*** Invest in the Next-Generation AMAC Tester (NGAT) while maintaining the Special Weapons Interface Tester (SWIFT) via design and development of improved, reliable test equipment adapted to modernized digital-enabled vehicles and weapons. Invest in and improve nuclear certification-specific data analysis capabilities (tools) to match growing weapon system complexity. Improve baseline and surge capability for AMAC testing, compatibility analyses and certification. Posture NGAT, NCAT, analyses, and processes to execute time-certain Full Weapon System Demonstrations (FWSDs) and other certification-required activities for F-35A, B-21, Long Range Standoff (LRSO) missile, GBSD, B-52H, modernized ICBM fuze, and seven Weapon Generation			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604222F / *Nuclear Weapons Support*	**Project (Number/Name)** 654807 / *Nuclear Weapon System Technology and Integration*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Facilities. Support DoD-requested capability growth for the NCAT analysis tool to optimize resource loading and program deconfliction. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increased to account for escalation in certification activity required to support and maintain schedule for all nuclear modernization programs that require nuclear certification, to include SECDEF-directed B-21 acceleration of nuclear delivery capability, LRSO schedule adjustments, and four simultaneous (vice serial) major modifications to the B-52H. Additionally, funding increased due to consolidation of nuclear certification management activities within this program element, under project 654236, Engineering Analysis, to this project as well as funding previously provided through the individual new/modified weapon systems that require nuclear certification.			
Accomplishments/Planned Programs Subtotals	14.169	19.474	61.411

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The objective of the NWST&I program strategy is to provide independent technical engineering, and scientific analyses, assessments and information in support of AF nuclear weapons systems while developing, and mentoring and shaping the next generation of AF resources. Multiple Cost Plus Fixed Fee (CPFF) and/or Time and Material (T&M) and Military Interdepartmental Purchase Requests (MIPR) are/will be used to execute testing and evaluations, technical analyses and/or provide focused support unique to the nuclear enterprise, for the technology and integration processes. All contracts will be openly competed.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604222F / *Nuclear Weapons Support*	**Project (Number/Name)** 654807 / *Nuclear Weapon System Technology and Integration*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NWST&I - Modeling & Simulation	C/CPFF	Peerless Technology Corp : Kirtland AFB, NM, NM	-	1.349	Apr 2021	2.182	Nov 2021	2.500	Nov 2022	-		2.500	Continuing	Continuing	-
NWST&I - FFRDC Engineering & Technical Support	MIPR	Aerospace Corp(SMC) : El Segundo, CA	-	1.416	Mar 2021	1.463	Nov 2021	4.650	Nov 2022	-		4.650	Continuing	Continuing	-
NWST&I - Security Support	MIPR	Various : Kirtland AFB, NM	-	1.187	Apr 2021	0.768	Dec 2021	0.768	Dec 2022	-		0.768	Continuing	Continuing	-
NWST&I - Program Support	C/CPFF	Booz Allen Hamilton : Kirtland AFB, NM	-	3.768	Mar 2021	3.430	Feb 2022	3.498	Dec 2022	-		3.498	Continuing	Continuing	-
NWS&I - Nuclear Certification Engineering Support	C/CPFF	Booz Allen Hamilton : Kirtland AFB, NM	-	-		-		38.055	Mar 2023	-		38.055	Continuing	Continuing	-
		Subtotal	-	7.720		7.843		49.471		-		49.471	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NWST&I - Weapons Effects Uncertainty Testing	MIPR	Sandia National Labs : Kirtland AFB, NM	-	1.000	Mar 2021	2.000	Jan 2022	2.000	Dec 2022	-		2.000	Continuing	Continuing	-
NWST&I - AFNRT Assessments 1	MIPR	Sandia National Labs : Various	-	3.765	Mar 2021	7.312	Dec 2021	7.441	Dec 2022	-		7.441	Continuing	Continuing	-
NWST&I - AFNRT Assessments 2	C/CPFF	Booz Allen Hamilton : Kirtland AFB, NM	-	1.344	Mar 2021	1.400	Feb 2022	1.400	Dec 2022	-		1.400	Continuing	Continuing	-
		Subtotal	-	6.109		10.712		10.841		-		10.841	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604222F / *Nuclear Weapons Support*	**Project (Number/Name)** 654807 / *Nuclear Weapon System Technology and Integration*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NWST&I Program Management Administration (PMA)	Various	Various : Kirtland AFB, NM	-	0.340	Sep 2021	0.919	Nov 2021	1.099	Mar 2023	-		1.099	Continuing	Continuing	-
		Subtotal	-	0.340		0.919		1.099		-		1.099	Continuing	Continuing	N/A

Remarks

PMA includes travel, supply and enclave system and communication support

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	14.169		19.474		61.411		-		61.411	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604222F / *Nuclear Weapons Support*	**Project (Number/Name)** 654807 / *Nuclear Weapon System Technology and Integration*

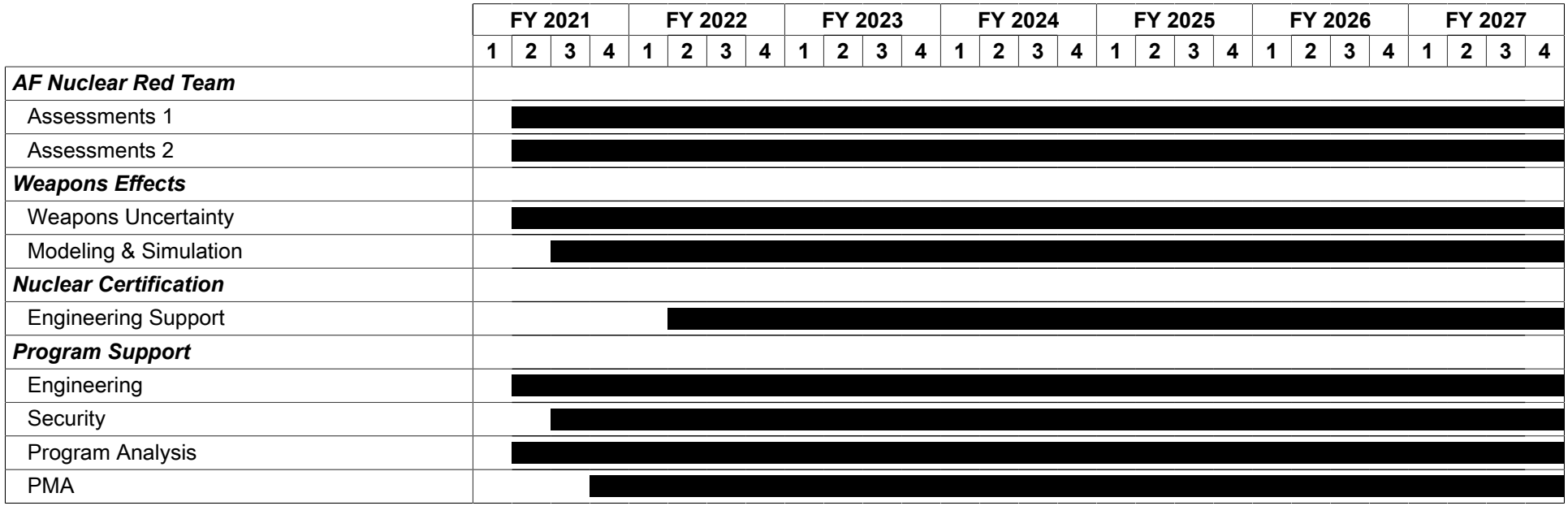

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604222F / *Nuclear Weapons Support*	**Project (Number/Name)** 654807 / *Nuclear Weapon System Technology and Integration*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
AF Nuclear Red Team				
Assessments 1	2	2021	4	2027
Assessments 2	2	2021	4	2027
Weapons Effects				
Weapons Uncertainty	2	2021	4	2027
Modeling & Simulation	3	2021	4	2027
Nuclear Certification				
Engineering Support	2	2022	4	2027
Program Support				
Engineering	2	2021	4	2027
Security	3	2021	4	2027
Program Analysis	2	2021	4	2027
PMA	4	2021	4	2027

Note

FY22 Will include re-phasing on multiple efforts to better align execution.
FY23 Increase due to funding being added to baseline to support nuclear certification efforts
All sub-projects are continuous support/testing to all nuclear weapon systems.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604222F / *Nuclear Weapons Support*	Project (Number/Name) 655708 / *Nuclear Weapons Support*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
655708: *Nuclear Weapons Support*	-	6.079	6.045	2.020	0.000	2.020	2.062	2.100	2.144	2.192	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The modernization of legacy nuclear systems, development of new nuclear-capable aircraft and munitions and the creation of the new Weapon Generation Facilities (WGF) within Air Force Global Strike Command (AFGSC) may require new support equipment capabilities to meet system and mission requirements. Additionally, the WGF introduces a new concept of operations by integrating maintenance and storage mission sets into one facility. To support mission generation requirements, support equipment and capabilities related to the nuclear enterprise must be studied, reviewed, modified, or in extreme cases, re-developed in order to maintain operational readiness. Examples of equipment under review include, but are not limited to, power generation, heating, ventilation, and air conditioning (HVAC), munition trailers/ accessories, munition lifts/accessories, tow vehicles, and munition test/maintenance stands such as the MHU-141, MHU-174, MHU-194, MHU-196/204, MHU-83 & MB-4. Any identified capability gaps may result in the design of new systems. The review, analysis and potential modification of existing equipment ensures mission generation remains executable.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Nuclear Enterprise Support Equipment	6.079	6.045	2.020
Description: Nuclear Enterprise Support Equipment Review and Design			
FY 2022 Plans: This effort completes the "Family-of-Jammers" capabilities based assessment & road-mapping study. Continue to develop and test a replacement system for the MHU-174 aerial stores lift truck used within the WGF that is currently unsupportable and obsolete. Continue to mature designs for large munitions lift trailers (20K & 40K class) required by AFGSC. Continue studies of agile, environmentally friendly universal flightline power generation and/or air conditioner systems to support nuclear enterprise aircraft such as the B-52, B-21, E-8, as well as dual-capable aircraft such as the F-35A, F-15E and F-16. These efforts support weapons system requirements documents and concept of operations. Efforts may include the limited procurement of commercial off-the-shelf electric (battery) power systems and/or advanced prototype systems to assess military suitability, feasibility, and maintainability of electrified systems in all operational environments.			
FY 2023 Plans: Studies and analyses from previous efforts in this program will be leveraged to develop the next generation of munitions handling equipment, stabilized power, HVAC, munitions stands and trailers, and aerospace ground equipment used to support the nuclear enterprise. Funding will support engineering associated with requirements definition, technology maturation, and risk reduction			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604222F / *Nuclear Weapons Support*	**Project (Number/Name)** 655708 / *Nuclear Weapons Support*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
needed to develop solutions to deliver prototypes which meet the evolving requirements of AFGSC for next-generation Common Aviation Support Equipment (CAvSE). ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreased due to delays in obligating funds resulting from a lack of rapid acquisition pathfinders. For RDT&E efforts, a modernization team was established for FY22 to execute funds and meet OSD goals.			
Accomplishments/Planned Programs Subtotals	6.079	6.045	2.020

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

1. The acquisition strategy for the Small Agile Lift Truck (SALT) is for MilTech, via a Partnership Intermediary Agreement, to engage and support industry partners, Manufacturing Extension Partnerships (MEP), and Subject Matter Experts on the development and delivery of two SALT demonstration prototypes.

2. The acquisition strategy for the MHU-TSX/M is for Air Force Global Strike Command to work with Square One Corporation to design, fabricate, and test an advanced robotic munitions loader for large aircraft.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604222F / *Nuclear Weapons Support*	Project (Number/Name) 655708 / *Nuclear Weapons Support*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contract Award - Aerial Stores Lift Truck (Sm/Med Class)	RO	AFRL/MilTech : Boseman, MT	-	-		3.015	May 2022	-		-		-	0.000	3.015	-
Contract Award - Aerial Stores Lift Truck (Large Class)	RO	AF Global Strike Cmd : Barksdale AFB, LA	-	-		1.910	May 2022	-		-		-	0.000	1.910	-
Contact Award - Electric Flightline Power Systems	TBD	TBD : TBD	-	-		-		0.520	Apr 2023	-		0.520	0.000	0.520	-
Nuclear Support Equipment Analysis	PO	WBB Inc/SERCO : Warner Robins, GA	-	0.309	Aug 2021	-		-		-		-	0.000	0.309	-
GPS Nav Systems (AFNWC/WNY)	MIPR	Northrop Grumman : W. Falls Church, VA	-	4.270	Dec 2021	-		-		-		-	0.000	4.270	-
		Subtotal	-	4.579		4.925		0.520		-		0.520	0.000	10.024	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Support	PO	PE Systems, Inc. : TBD	-	0.500	Sep 2021	0.870	Mar 2022	1.500	Jan 2024	-		1.500	Continuing	Continuing	-
Government Management Services	Various	SERCO : Herndon, VA	-	1.000	Mar 2022	0.250	Sep 2022	-		-		-	0.000	1.250	-
		Subtotal	-	1.500		1.120		1.500		-		1.500	Continuing	Continuing	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	6.079		6.045		2.020		-		2.020	Continuing	Continuing	N/A

Remarks

Due to a lack of rapid acquisition pathfinders to support this project, funds were realigned to support AFNWC/WNY (electronic warfare).

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604222F / *Nuclear Weapons Support*	**Project (Number/Name)** 655708 / *Nuclear Weapons Support*

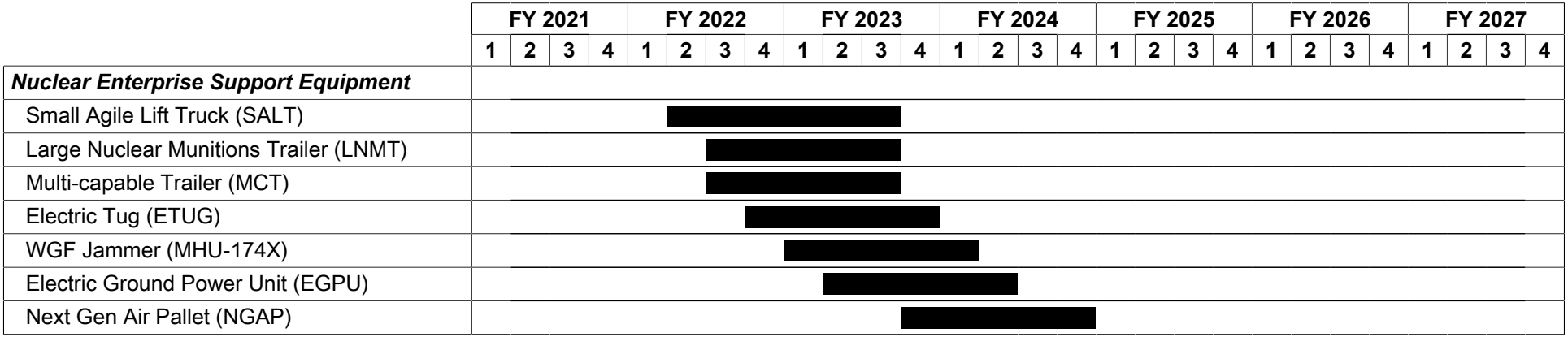

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604222F / *Nuclear Weapons Support*	**Project (Number/Name)** 655708 / *Nuclear Weapons Support*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Nuclear Enterprise Support Equipment				
Small Agile Lift Truck (SALT)	2	2022	3	2023
Large Nuclear Munitions Trailer (LNMT)	3	2022	3	2023
Multi-capable Trailer (MCT)	3	2022	3	2023
Electric Tug (ETUG)	4	2022	4	2023
WGF Jammer (MHU-174X)	1	2023	1	2024
Electric Ground Power Unit (EGPU)	2	2023	2	2024
Next Gen Air Pallet (NGAP)	4	2023	4	2024

Note

The projects within the Weapons Generation Facility program target workflow and operation of current and future nuclear-certified systems.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604270F / *Electronic Warfare Development*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	2.017	7.110	2.222	0.000	2.222	13.773	18.123	18.507	18.918	Continuing	Continuing
653891: *Adv Infrared Counter Measures(Aircm)*	-	2.017	7.110	2.222	0.000	2.222	13.773	18.123	18.507	18.918	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Advanced Infrared Countermeasure (AIRCM) project contains related aircraft self-protection efforts aimed at increasing aircraft survivability against the increasing threat of sophisticated surface-to-air and air-to-air missiles. These missiles may employ sophisticated next-generation Electro-Optics (EO), Infrared (IR), Radio Frequency (RF), dual-mode (i.e. IR and RF), or multi-mode seekers. AIRCM will provide advanced expendable countermeasures and/or techniques that will be functionally compatible with existing dispenser systems and employed across multiple USAF weapons systems. This also includes any and all flare, chaff, decoy, and associated component development and testing that may be demanded or needed in current and future operations regardless of aircraft platform. Similar activities that are supplementary to this effort may be accomplished ad hoc using platform specific funding or through other activities such as joint services or NATO test groups.

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 FY21, $0.00 was expended for civilian pay expenses in this program element, and in FY22 $0.00 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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	2.094	2.110	0.000	0.000	0.000
Current President's Budget	2.017	7.110	2.222	0.000	2.222
Total Adjustments	-0.077	5.000	2.222	0.000	2.222
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	5.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.077	0.000			
• Other Adjustments	0.000	0.000	2.222	0.000	2.222

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604270F / *Electronic Warfare Development*

Change Summary Explanation

FY23: The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604270F / *Electronic Warfare Development*	Project (Number/Name) 653891 / *Adv Infrared Counter Measures(Aircm)*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
653891: *Adv Infrared Counter Measures(Aircm)*	-	2.017	7.110	2.222	0.000	2.222	13.773	18.123	18.507	18.918	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Advanced Infrared Countermeasure (AIRCM) project contains related aircraft self-protection efforts aimed at increasing aircraft survivability against the increasing threat of sophisticated surface-to-air and air-to-air missiles. These missiles may employ sophisticated next-generation Electro-Optics (EO), Infrared (IR), Radio Frequency (RF), dual-mode (i.e. IR and RF), or multi-mode seekers. AIRCM will provide advanced expendable countermeasures and/or techniques that will be functionally compatible with existing dispenser systems and employed across multiple USAF weapons systems. This also includes any and all flare, chaff, decoy, and associated component development and testing that may be demanded or needed in current and future operations regardless of aircraft platform. Similar activities that are supplementary to this effort may be accomplished ad hoc using platform specific funding or through other activities such as joint services or NATO test groups.

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 FY21 $0.00 was expended for civilian pay expenses in this program element, and in FY22 $0.00 is forecasted for civilian pay expenses in this program element.

This program element may include necessary test or evaluation equipment required to assess Advanced Infrared Countermeasure weapons system capabilities.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Countermeasure Development and Testing	2.017	2.110	2.222	-	2.222
Description: Development, testing and qualification of EO, IR, and RF countermeasures on aircraft					
FY 2022 Plans: Activities include development, testing and qualification of expendable countermeasures or cocktails on various aircraft.					
FY 2023 Base Plans: Activities include development, testing and qualification of expendable countermeasures or cocktails on various aircraft.					
FY 2022 to FY 2023 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604270F / *Electronic Warfare Development*	**Project (Number/Name)** 653891 / *Adv Infrared Counter Measures(Aircm)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Marginal increase due to inflation adjustments.					
Title: Wide Band Receiver for Radar Jammer	0.000	5.000	0.000	0.000	0.000
Description: Next Generation Ultra Wide Band Receiver ***FY 2022 Plans:*** Develop ultrawide band receiver for radar jammers ***FY 2023 Base Plans:*** N/A ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY22 Funds are Congressional Add					
Accomplishments/Planned Programs Subtotals	2.017	7.110	2.222	0.000	2.222

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• PAAF 01 352010: *Cartridges*	20.618	26.483	-	-	-	-	-	-	-	Continuing	Continuing
• PAAF 01 356010: *Flares*	61.259	85.934	120.548	-	120.548	79.250	80.797	82.203	83.664	Continuing	Continuing

Remarks

Qualified flares, if not in AF inventory, will be procured under program 0208030F War Reserve Munitions, Flares.

D. Acquisition Strategy

Contracts are awarded through the Department of Defense Ordnance Technology Consortium (DOTC), or Other Transaction Athorities (OTAs), such as Cornerstone Industrial Base Analysis & Sustainment (IBAS), which facilitates collaborative Government, Industry, and Academic ordnance technology development and prototyping initiatives. They serve as a single point contracting agent for development/technology demonstrations needed to advance and expand our military technological superiority.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604270F / *Electronic Warfare Development*	**Project (Number/Name)** 653891 / *Adv Infrared Counter Measures(Aircm)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
IR/UV: Black Body Thrusted Flare	C/CPFF	Cornerstone OTA : TBD, TN	-	-		1.110	Jun 2022	1.222	Jan 2023	-		1.222	Continuing	Continuing	-
Ultra Wide Band Receiver for Radar Jammer	TBD	TBD : TBD	-	-		5.000	Jun 2022	-		-		-	Continuing	Continuing	-
		Subtotal	-	-		6.110		1.222		-		1.222	Continuing	Continuing	N/A

Remarks

Development of Advanced Expendable Countermeasures to defeat currently fielded threats from which aircraft are not sufficiently protected.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Modeling and Simulation	MIPR	Air Force Research Laboratory : WPAFB, OH	-	1.000	Jun 2021	1.000	Jun 2022	1.000	Jan 2023	-		1.000	Continuing	Continuing	-
Test Support	MIPR	Various : NV	-	1.017	Jun 2021	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	2.017		1.000		1.000		-		1.000	Continuing	Continuing	N/A

Remarks

Modeling and simulation
- This entails performance of modeling and simulation (to include threat hardware in-the-loop) which helps to predict advanced expendable countermeasure effectiveness and develop and define Air Force requirements
- Performing activity varies; conducted by AFRL and Georgia Tech Research Institute

Range Test
- This is the cost to use the range for testing (Radiometric, Captive Seeker, Flight, etc.)
- Performing Activity & Location varies; 96th Test Wing, Eglin AFB, FL, White Sands Missile Range, NM, Gila Bend, AZ

Test Support
- This includes but is not limited to Seeker Test Vans (multiple vans required for Captive Seeker), duo chrome camera, and other test equipment
- Activities/support during testing (i.e. communications/electric/security)
- Performing Activity & Location should remain "Various: TBD", multiple activities are included

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604270F / *Electronic Warfare Development*	Project (Number/Name) 653891 / *Adv Infrared Counter Measures(Aircm)*	

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	2.017	7.110	2.222	-	2.222	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604270F / *Electronic Warfare Development*	**Project (Number/Name)** 653891 / *Adv Infrared Counter Measures(Aircm)*

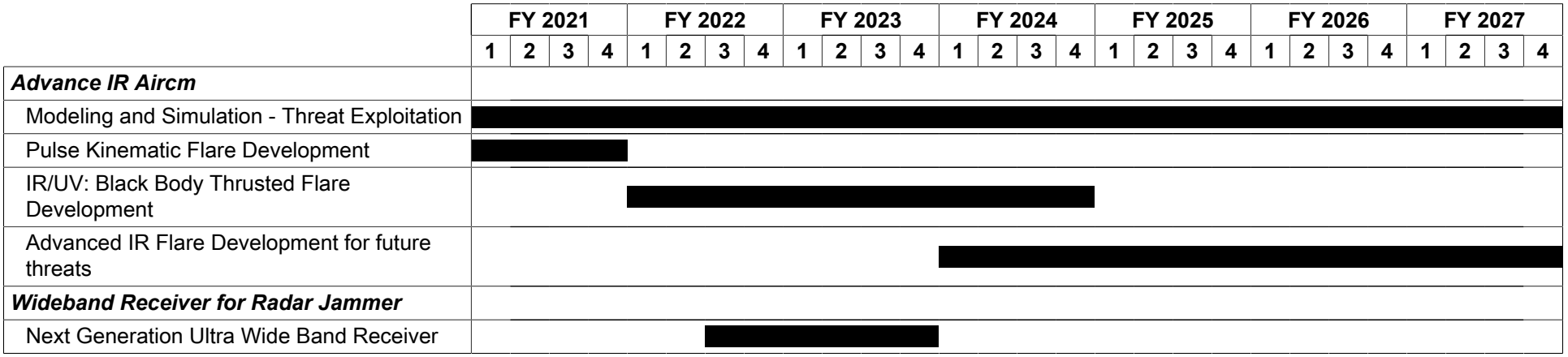

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604270F / *Electronic Warfare Development*	**Project (Number/Name)** 653891 / *Adv Infrared Counter Measures(Aircm)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Advance IR Aircm				
Modeling and Simulation - Threat Exploitation	1	2021	4	2027
Pulse Kinematic Flare Development	1	2021	4	2021
IR/UV: Black Body Thrusted Flare Development	1	2022	4	2024
Advanced IR Flare Development for future threats	1	2024	4	2027
Wideband Receiver for Radar Jammer				
Next Generation Ultra Wide Band Receiver	3	2022	4	2023

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604281F / *Tactical Data Networks Enterprise*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	111.125	159.836	133.117	0.000	133.117	92.813	73.994	75.790	77.481	Continuing	Continuing
655050: *TDL System Integration*	-	99.584	109.252	133.117	0.000	133.117	92.813	73.994	75.790	77.479	Continuing	Continuing
655262: *Family of Gateways*	-	11.541	50.584	0.000	0.000	0.000	0.000	0.000	0.000	0.002	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Tactical Data Networks Enterprise (TDNE) develops, enhances and fields Tactical Data Links (TDL) including internet protocol (IP) networks, advanced waveforms, radios, network management tools, and associated hardware and software that comprise the Joint Aerial Layer Network (JALN). This will be accomplished by upgrading currently fielded communications and TDL systems and IP networks. The upgrades align with the development and fielding of more advanced systems in support of the Advanced Battle Management System (ABMS). ABMS is a family of systems which provides capabilities consisting of air, land, and maritime surveillance, tactical communications and networking, integrated with battle management command and control in support of Joint forces. ABMS is an integral component to transition to the Joint All Domain Command and Control (JADC2) concept at the tactical level of warfare. TDNE supports the development, fielding and training of aerial layer networking capabilities across multiple force projection missions including air superiority, ground precision attack, command and control, intelligence, surveillance and reconnaissance (ISR), and personal recovery while integrating capabilities with space operations. TDNE also addresses warfighter urgent demands through the establishment of Quick Reaction Capabilities (QRC) and enterprise activities. TDNE executes quick reaction response capability requests by the warfighter and support activities (including ramp-up) associated with the JALN enterprise. This program ensures the continued enhanced interoperability of Air Force and joint/coalition/NATO assets through efforts such as early systems engineering for program requirements analysis and architectural design development/coordination of all TDN standards and management capabilities, configuration management, platform/system interoperability assessments, development of government reference architectures, interoperability certification testing, and flight testing. The aerial layer extends to interfacing with space communication assets (both military and commercial). An example of this interface work includes the use of the Protected Tactical Waveform (PTW) designed to mitigate the effects of advanced jamming in Anti-Access/Area Denial environments.). PTW provides worldwide, beyond line of sight, Anti-Jam (AJ), Low Probability of Intercept communications, via military and commercial satellite systems for tactical users in all services. It includes terminal certification efforts (Information Assurance (IA), NSA and MIL-STD). PTW development activities may include technical and acquisition-related studies, analysis, early systems engineering and risk reduction activities, addressing all subsystems to support both current program planning/execution and future AF program planning. This effort also funds PTW modem development and aperture development on suitable platforms. Satellite communication efforts includes all necessary system components to leverage commercially available space assets such as antennas modems, and network management support systems.

TDL System Integration will provide for the study (acquisitions current and proposed), analysis, enhancement, development, integration, demonstration, test, and evaluation of TDLs as a subset of the broader aerial layer networks. TDLs are used in both peace time and combat environments to exchange information such as character-oriented and fixed-formatted messages, data, radar tracks, target information, platform status, imagery, free-text messaging and command assignments. TDLs provide interoperability, local and global connectivity, and situational awareness to the user when training or fighting under rapidly changing operational conditions. TDLs increase mission effectiveness by providing enhanced air domain situational awareness, positive combat identification of aircraft in the network, fusion/correlation of on- and off-board sensor data, digital sharing of machine-to-machine target and threat information, thereby, enabling time critical targeting and other mission assignment

tasking. TDLs are used by all service theater command and control (C2) elements, weapons platforms, and sensors. TDLs include, but are not limited to: Link 16, Link 22, and other Advanced TDL Link technologies, such as Tactical Targeting Network Technology (TTNT), Common Data Link (CDL), Intra-Flight Data Link (IFDL) and Multifunction Advanced Data Link (MADL) . SATURN (Second-Generation Anti-Jam Tactical UHF Radio for NATO) is the next generation UHF line-of-sight link and is required to supporting a DoD CIO Mandate a resilient voice and data capability for operations in a contested environment. Agile Communications includes the capability to share tactically significant information within/to/from highly contested environments in support of the Air Superiority 2030 Flight Plan. Agile Communication efforts provide processes and coordination for enterprise communication development activities. High Capacity Backbone (HCB), a subset of the overall ABMS plan, will provide the warfighter with a robust communication infrastructure enhancing C2 capabilities. HCB connects users operating within disadvantaged conditions to space and terrestrial communications utilizing Deployed Ground Entry Points (DGEP) and aerial nodes. To address future Advanced Tactical Datalinks, development of a Software Programmable OMS compliant (SPOC) radio terminal prototype is being built and tested. SPOC will provide a next generation radio set capable of hosting a variety of advanced tactical datalinks which aligns with the ABMS plan, and allows for more than one waveform operating simultaneously resulting in improved connectivity and situational awareness for the warfighter.

Communication gateways are necessary to support systems of systems integration and the delivery of information exchanges across disparate physical and logical network pathways. Gateway functions include enabling interoperability between data formats, protocols, and communication mediums. Additionally, gateway functions extend the connectivity range, consolidate data from multiple networks into high capacity links for transmission to key C2ISR nodes, route information between disadvantaged users, and fuse/correlate data from multiple sources to improve accuracy. Gateway functions also provide application hosting, shared data storage, on-demand information access, smart data forwarding, and system monitoring and network management. Family of Gateways provides for the study (acquisitions current and proposed), analysis, enhancements, development, integration, costing, demonstration, test, and evaluation efforts related to future TDL communications development that will allow joint combat forces to exchange information quickly and accurately by bridging discrete airborne, terrestrial, maritime, and space-based C4ISR networks producing operational effects not possible within individual networks. Additionally, Family of Gateways will support enhancements of existing TDL performance, through upgrades and engineering analysis of system designs. Efforts in this project include waveform, ground, and rapid acquisition activities supporting Air Force requirements for communication bridging across multiple platforms, sources and communication domains.

This program element may include necessary civilian pay expenses required to support, manage, execute, and deliver weapon system capabilities across the BACN platforms, aerial network, and tactical data network enterprise. 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 FY2021 0.900M was expended for civilian pay expenses in this program element, and in FY2022 0.900M is forecasted for civilian pay expenses in this program element.

Family of Gateways provides for the study (acquisitions current and proposed), analysis, enhancement, development, integration, costing demonstration, test and evaluation efforts that will allow joint combat forces to exchange information quickly and accurately by bridging discrete airborne, terrestrial, maritime and space-based C4ISR networks producing operational effects not possible within individual networks. Activities also include studies, analysis, demonstrations and experiments to support both current program planning/execution and future program planning efforts for Family of Gateways or other applicable platforms to include but not limited to E-11 Battlefield Airborne Communications Node (BACN).

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604281F / *Tactical Data Networks Enterprise*

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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	121.188	169.836	0.000	0.000	0.000
Current President's Budget	111.125	159.836	133.117	0.000	133.117
Total Adjustments	-10.063	-10.000	133.117	0.000	133.117
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-10.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-9.900	0.000			
• SBIR/STTR Transfer	-0.163	0.000			
• Other Adjustments	0.000	0.000	133.117	0.000	133.117

Change Summary Explanation

FY21: 9.9M realigned for higher AF priorities & 0.163M decrease for Small Business Innovation Research.

FY22: Decrease of 10M based on Congressional mark.

FY23: The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604281F / *Tactical Data Networks Enterprise*	Project (Number/Name) 655050 / *TDL System Integration*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
655050: *TDL System Integration*	-	99.584	109.252	133.117	0.000	133.117	92.813	73.994	75.790	77.479	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Tactical Data Links (TDL) System Integration provides for the study, analysis, enhancement, development, integration, demonstration, joint/coalition/NATO interoperability exercises, costing, test, trials, and evaluation of TDL as a subset of the broader aerial layer network. TDLs are used in both peacetime and combat environments to exchange information such as character-oriented and fixed-formatted messages, data, radar tracks, target information, platform status, imagery, free-text messaging and command assignments. TDLs provide interoperability, local and global connectivity, and situational awareness to the user when training or fighting under rapidly changing operational conditions. TDLs increase mission effectiveness by providing enhanced air domain situational awareness, positive combat identification of aircraft in the network, fusion/correlation of on- and off-board sensor data, digital sharing of machine to machine target and threat information and, thereby, enabling time critical targeting and other mission assignment tasking. TDLs are used by all service, NATO, and coalition theater C2 elements, weapons platforms, and sensors.

The number of Air Force platforms hosting TDLs has expanded from C2 aircraft (E-3, E-8, E-11A, EQ-4B, etc.) to the fighter, bomber, intelligence, surveillance and reconnaissance (ISR), tanker, airlift and other tactical fleets (F-15, F-16, F-22A, Rivet Joint, B-1, B-2, B-52, KC-46, etc.), as well as precision guided munitions. Utilization of TDLs in joint and international environments requires the integration of terminals into host platforms and interoperability of TDL networks across all deployed joint/Coalition/NATO platforms. USAF mandates require additional studies and analysis in order to meet frequency reprogramming and cryptographic requirements.

High Capacity Backbone (HCB) effort implements an incremental approach for deploying resilient reach back connectivity to DISN services and in-theater rear echelon organizations through dedicated aerial gateways and opportunistic airborne nodes. The HCB Transport supports a robust deployable ground infrastructure required, through reach back, range extension and payload control. It will use an open system approach composed of non-proprietary government and commercial interface standards. Link 16 Enhancement will develop and field advanced signal processing capabilities on 4th and 5th generation platforms to address threats in the contested and highly contested environments.

Efforts in this project include waveform and integration activities.
Waveform:
Waveform activities include, but are not limited to, enabling and supporting Joint Interoperability of Tactical Command and Control Systems (JINTACCS), joint/Coalition/NATO Interoperability, Link 16 enhancements, and development of a next generation waveform and/or advanced tactical data link. Funding will provide training, logistics development, testing and certification of individual TDL implementations to joint/allied standards, establishment of service-wide network management procedures/operations, and system-wide enhancements/testing, demonstration and experimentation.
Integration:

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604281F / *Tactical Data Networks Enterprise*	**Project (Number/Name)** 655050 / *TDL System Integration*

Integration activities include but are not limited to, Data Link Test Facility (DTF), MIDS JTRS, Air Force Participating Test Unit (AFPTU), Interoperable System Management and Requirements Transformation (iSMART), Network Centric Capability Assessment (NCCA), NATO interoperability, Coalition interoperability, , integration analysis of C2 of JALN, Combat Cloud, Protected Tactical Waveform (PTW), second generation Anti Jam(AJ) Tactical Ultra High Frequency(UHF) Radio for North Atlantic Treaty Organization(NATO) (SATURN) and analysis of integration on platforms of existing TDN systems, system-of-systems analysis. Funding will ensure continued enhanced interoperability of Air Force/joint/Coalition/NATO assets through efforts such as early systems engineering for program requirements analysis and architectural design development/coordination of all TDN standards and management capabilities, configuration management, platform/system interoperability assessments, development of government reference architectures, integration of cyber technologies, interoperability certification testing, and flight testing, demonstration and experimentation.

Activities also include studies, prototypes, analysis (engineering and cost), demonstrations and experiments to support both current program planning and execution and future program planning efforts for Tactical Data Networks (TDN), to include but not limited to development of joint concepts for C2, Analysis of Alternatives (AoA) follow-on analysis, advanced gateway planning, development/integration of Advanced Battle Management systems (ABMS) capabilities, across all aerial network and tactical data networks enterprise platforms including (but not limited to) E-11 Battlefield Airborne Communications Node (BACN).

Activities will also include joint/Coalition/NATO Interoperability that provides program office system engineering to support Foreign Military Sales (FMS).
Agile Communications include the capability to share tactically significant information within/to/from highly contested environments in support of the Air Superiority 2030 Flight Plan. Agile Communication efforts provide for pre-Analysis of Alternatives (AoA) and development activities. Agile Communications supports the application of open standards & advanced apertures over an Enterprise-wide Aerial Network, enabling all platforms to share combat-relevant data/info to, from & within the Highly Contested Environment (HCE).

This program element may include necessary civilian pay expenses required to support, manage, execute, and deliver weapon system capabilities across the BACN platforms, aerial network, and tactical data network enterprise. 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 0.9M was expended for civilian pay expenses in this program element, and in CY 0.9M is forecasted for civilian pay expenses in this program element.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Tactical Data Networks (TDN) Integration	25.594	25.946	24.420
Description: TDN Integration activities include but are not limited to, Data Link Test Facility (DTF), Air Force Participating Test Unit (AFPTU), Network Centric Capability Assessment (NCCA), Joint/Coalition/NATO Interoperability, Analysis of Alternatives (AoA) follow-on, gateway planning as well as Joint Interoperability of Tactical Command and Control Systems (JINTACCS) ensures interoperability of TDL systems with associated joint, allied, and Coalition systems. It includes configuration management of TDL Military Standards (MIL-STDs), TDL message development, interoperability test/certification, and TDL message standard implementation using interoperable System Management and Requirements Transformation (iSMART) for Link 16, Link 22, Intra-flight Data Link (IFDL), Multifunction Advanced Data Link (MADL), and others. Full Motion Video (FMV) Extended Unified Relay (FEURY) system development.			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604281F / *Tactical Data Networks Enterprise*	**Project (Number/Name)** 655050 / *TDL System Integration*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY 2022 Plans: -Will continue to manage the development, certification, training and logistics plans for individual TDL implementations to Joint/ allied standards. -Will continue to provide the necessary engineering, technical, and administrative support required to add and/or update Air Force platform and system information exchange requirements -Will continue to ensure compatibility and interoperability of TDLs by funding required Air Force/joint MIL-STD compliance and interoperability tests -Will continue to ensure compatibility and interoperability of TDLs by developing TDL messaging capability to address new or updated operational requirements -Will further develop FEURY systems ***FY 2023 Plans:*** -Will continue to manage the development, certification, training and logistics plans for individual TDL implementations to Joint/ allied standards. -Will continue to provide the necessary engineering, technical, and administrative support required to add and/or update Air Force platform and system information exchange requirements -Will continue to ensure compatibility and interoperability of TDLs by funding required Air Force/joint MIL-STD compliance and interoperability tests -Will continue to ensure compatibility and interoperability of TDLs by developing TDL messaging capability to address new or updated operational requirements -Will further develop FEURY systems ***FY 2022 to FY 2023 Increase/Decrease Statement:*** TDN integration requirements fluctuate based on scope of analysis development, certification efforts for AFPTU (AF Participating Unit), JINTACC (Joint Interoperability of Tac Command & Control Sys), NATO interoperability, and Coalition implementation. Reduction in requirements for MAVRK/FEURY reduced funding between FY 22 & FY 23.			
Title: High Capacity Backbone (HCB) ***Description:*** High Capacity Backbone (HCB) is an expeditionary dynamic network made up of aerial and ground nodes that augment existing communication networks to greatly increase connectivity, network capacity, and information sharing at all security levels in order to effectively employ military capability across the range of military operations. HCB reduces joint forces reliance on limited, relatively fixed/static satellite and surface line-of-sight communication components. HCB rapid prototyping is a demonstration of HCB network transport installed in existing USAF aircraft and deployable ground entry points that meets this Rapid Prototyping Requirements Document's threshold technical and functional requirements while operating as an integral part of an aerial layer network in a realistic operational environment	13.190	35.531	33.464

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604281F / *Tactical Data Networks Enterprise*	**Project (Number/Name)** 655050 / *TDL System Integration*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
HCB capabilities are required to close four specific capability gaps: network connectivity, network capacity, share information and data, and network management. ***FY 2022 Plans:*** -Will continue the development of the airborne and ground prototypes -Will conduct test of the prototypes -Will develop a follow-on contract for fielding of the HCB that will be fielded on various airborne platforms ***FY 2023 Plans:*** will develop a follow on contract for fielding of the HCB that will be fielded on various airborne platforms ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding ramped up in FY22 to refine prototypes into production ready hardware/software and increased testing (both ground/flight) and then in FY23 ramped down as efforts shift toward readying HCB for production/fielding.			
Title: Protected Tactical Waveform (PTW)	3.146	0.000	23.526
Description: Protected Tactical Waveform (PTW) is a waveform designed to mitigate the effects of advanced jamming in Anti-Access/Area Denial environments. PTW provides worldwide, beyond line of sight, Anti-Jam (AJ), Low Probability of Intercept communications, via military and commercial satellite systems for tactical users in all Services. This effort funds PTW modem development and aperture development on suitable platforms to include but not limited to; F-35, RQ-4 Global Hawk and EQ-4B/E-11A Battlefield Airborne Communications Node (BACN). PTW provides communications path diversity by increasing SATCOM resilience through satellite, spectral, and waveform diversity. This effort continues work started in Protected Tactical Service Field Demonstration (PTSFD) to complete PTW maturity and modem development, leveraging TALON Tacet Avis aperture work to develop PTW antenna and radome. It includes terminal certification efforts (Information Assurance (IA), NSA and MIL-STD). This effort funds continued development of PTW components, protected tactical terminal modems that will be capable of being fully integrated into existing wideband terminals and will ensure delivery of protected tactical SATCOM to the joint and coalition warfighters in contested, degraded environments. PTW development activities may also include technical and acquisition related studies, analysis, and early systems engineering and risk reduction activities addressing all subsystems to support both current program planning/execution and future AF program planning. ***FY 2022 Plans:*** No funding requested in FY22. ***FY 2023 Plans:*** -Continue the development, integration and testing of an airborne modem that will be utilized by fighter and wide-body aircraft.			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604281F / *Tactical Data Networks Enterprise*	**Project (Number/Name)** 655050 / *TDL System Integration*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
-Develop a standards-based PTW modem with Anti-Jam (AJ) capability to augment existing Aerial SATCOM terminals across vendors and platforms. -Continue addition of COMSEC capability to allow use of classified data and fully certify the crypto to be able to encrypt data for multiple waveforms. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Unintended delays in project development and testing altered the scope pushing requirements to later FY re-aligned funds in FY22 to higher priority efforts within the TDNE program.			
Title: Agile Comms ***Description:*** Agile Comms supports the application of open standards, multi-function processors, and advanced apertures over an Enterprise-wide Aerial Network, enabling all platforms to share combat-relevant data/info to, from and within the Highly Contested Environment (HCE) regardless of the data link and messages format that they are operating on. It supports the application of open standards, multi-function processors, and advanced apertures over the Enterprise-wide Aerial Network, enables all platforms to share combat relevant data/info to, from and within the Highly Contested Environment. This includes Supporting the development of airborne gateways. Agile Comms further includes initial integration of advanced communications and networking capabilities onto tactically-relevant aircraft. Finally, funding supports planning, data collection, development and analysis for initial technology maturation experimentation campaign. ***FY 2022 Plans:*** - Continue to develop and demonstrate the Common Tactical Edge Network (CTEN) Minimum Viable Product (MVP) and mature the Enterprise Approach to the Joint Aerial Network ***FY 2023 Plans:*** -Continue to develop and demonstrate the Common Tactical Edge Network (CTEN) Minimum Viable Product (MVP) and mature the Enterprise Approach to the Joint Aerial Network ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increased scope of demonstration efforts to support maturing Enterprise approach.	41.585	40.867	43.874
Title: Link 16 Enhancements ***Description:*** Link 16 Enhancement will develop and field Link 16 Anti Jam (AJ) capabilities on 4th and 5th generation platforms to address Link 16 jamming threats in the contested and highly contested environments. This effort will implement Link 16 technologies into TDL terminals and investigate the integration of additional emerging technologies to improve communications reliability. This effort will maintain a government-controlled technical baseline(s) to efficiently execute development and	11.564	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604281F / *Tactical Data Networks Enterprise*	**Project (Number/Name)** 655050 / *TDL System Integration*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
enhancements. Emerging technologies will be developed and evaluated for efficacy; recommendations will be identified for appropriate terminal fielding/upgrades to platforms and will be considered when evaluating enterprise TDL capabilities/gaps. ***FY 2022 Plans:*** No funding in FY22 ***FY 2023 Plans:*** No funding in FY23 ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Development funding reduced to 0 as Link 16 specific enhancements such as enhanced throughput and concurrent multi-netting are completed and prepared for integration into payloads/platforms/terminals.			
Title: SFF/DACAS Modernization and System-of-Systems (SoS) Enterprise Integration ***Description:*** This effort will support the development and demonstration of Small Form Factor (SFF) technologies that can support Digitally Assisted Close Air Support (DACAS) and other missions across the full spectrum of operating environments. This effort will consider System-of-Systems (SoS) engineering, technical analysis/performance, platform integration, and Tactics, Techniques, and Procedures (TTPs) to best utilize technologies and acquisition approaches for enterprise modernization. SFF Phase II (TURTLE) will be a rapid prototyping and demonstration effort. ***FY 2022 Plans:*** -Will conduct testing of solutions with JTACS and TACP fielders ***FY 2023 Plans:*** Will conduct testing of solutions with JTACS and TACP fielders. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Slight increase of funds due to new phase of development.	4.505	6.908	7.833
Accomplishments/Planned Programs Subtotals	99.584	109.252	133.117

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• RDTE 07 PE 0207448F: *C2ISR TDL*	1.559	1.587	1.616	-	1.616	-	-	-	-	Continuing	Continuing
• APAF 05 Line Item F01500: *F-15*	40.167	20.933	21.310	-	21.310	-	-	-	-	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604281F / *Tactical Data Networks Enterprise*	**Project (Number/Name)** 655050 / *TDL System Integration*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• APAF 05 Line Item F01600: *F-16*	8.525	8.695	8.851	-	8.851	-	-	-	-	Continuing	Continuing
• APAF 05 Line Item B00200: *B-2A*	0.206	0.210	0.213	-	0.213	-	-	-	-	Continuing	Continuing
• APAF 05 Line Item B01B00: *B-1B*	0.000	0.000	0.000	-	0.000	-	-	-	-	Continuing	Continuing
• OPAF 03 Line Item 834010: *General Information Technology*	1.698	1.701	1.731	-	1.731	-	-	-	-	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Airborne Networking Directorate provides for common development, integration, and interoperability across the entire airborne network and ensures that data links are procured and maintained as a joint, end-to-end command and control system. Platform acquisition strategies vary by program, but the majority of development and integration is normally accomplished by the weapon system prime contractor.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604281F / *Tactical Data Networks Enterprise*	**Project (Number/Name)** 655050 / *TDL System Integration*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TDN Integration	Various	Various : Various	-	21.474	Jan 2021	20.946	Jan 2022	9.670	May 2023	-		9.670	Continuing	Continuing	-
High Capacity Backbone (HCB)	C/TBD	Various : Various	-	13.190	Mar 2021	30.531	Mar 2022	19.043	Feb 2023	-		19.043	Continuing	Continuing	-
Agile Comms	Various	Various : Various	-	36.381	Apr 2021	38.367	Jan 2022	47.874	May 2023	-		47.874	Continuing	Continuing	-
SFF/DACAS Modernization and SoS Enterprise	Various	Various : Various	-	4.505	Apr 2021	4.752	Jan 2022	9.833	Feb 2023	-		9.833	Continuing	Continuing	-
Link 16 Enhancements	Various	Various : Various	-	11.564	Apr 2021	-		0.000		-		0.000	Continuing	Continuing	-
Protected Tactical Waveform (PTW)	C/TBD	Not specified. : TBD	-	3.146		-		34.947	Mar 2023	-		34.947	Continuing	Continuing	-
		Subtotal	-	90.260		94.596		121.367		-		121.367	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TDN Integration - DTF	PO	46th Test Squadron : Eglin AFB, FL	-	0.000	Jan 2021	1.500	Dec 2021	1.500	Nov 2022	-		1.500	Continuing	Continuing	-
JINTACCS	C/FFP	Spectrum Comm Inc : Newport News, VA	-	3.048	Feb 2021	3.815	Mar 2022	3.900	Mar 2023	-		3.900	Continuing	Continuing	-
TDN Integration - AFPTU	Various	Various : Various	-	2.156	Aug 2021	2.336	Jan 2022	2.500	Sep 2023	-		2.500	Continuing	Continuing	-
		Subtotal	-	5.204		7.651		7.900		-		7.900	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TDN Integration PMA - A&AS support - NCCA,	C/CPAF	Various : Various	-	3.000	Dec 2020	6.000	Apr 2022	3.000	Apr 2023	-		3.000	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604281F / *Tactical Data Networks Enterprise*	Project (Number/Name) 655050 / *TDL System Integration*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Coalition Interoperability, JALN AoA															
TDN Integration PMA - FFRDC support - Coalition Interoperability, JALN AoA	C/T&M	MITRE : Bedford, MA	-	0.600	Sep 2021	0.510	Jan 2022	0.450	Dec 2022	-		0.450	Continuing	Continuing	-
TDN Integration PMA - Travel, Government Purchase Cards, etc...DTF, NCCA, Coalition Interoperability, AFPTU, JALN AoA	Various	Various : Various	-	0.500	Sep 2021	0.450	Sep 2022	0.300	Sep 2023	-		0.300	Continuing	Continuing	-
JINTACCS PMA - Travel, Government Purchase Cards, etc...	Various	Various : Various	-	0.020	Sep 2021	0.045	Sep 2022	0.100	Sep 2023	-		0.100	Continuing	Continuing	-
		Subtotal	-	4.120		7.005		3.850		-		3.850	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	99.584		109.252		133.117		-		133.117	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604281F / *Tactical Data Networks Enterprise*	**Project (Number/Name)** 655050 / *TDL System Integration*

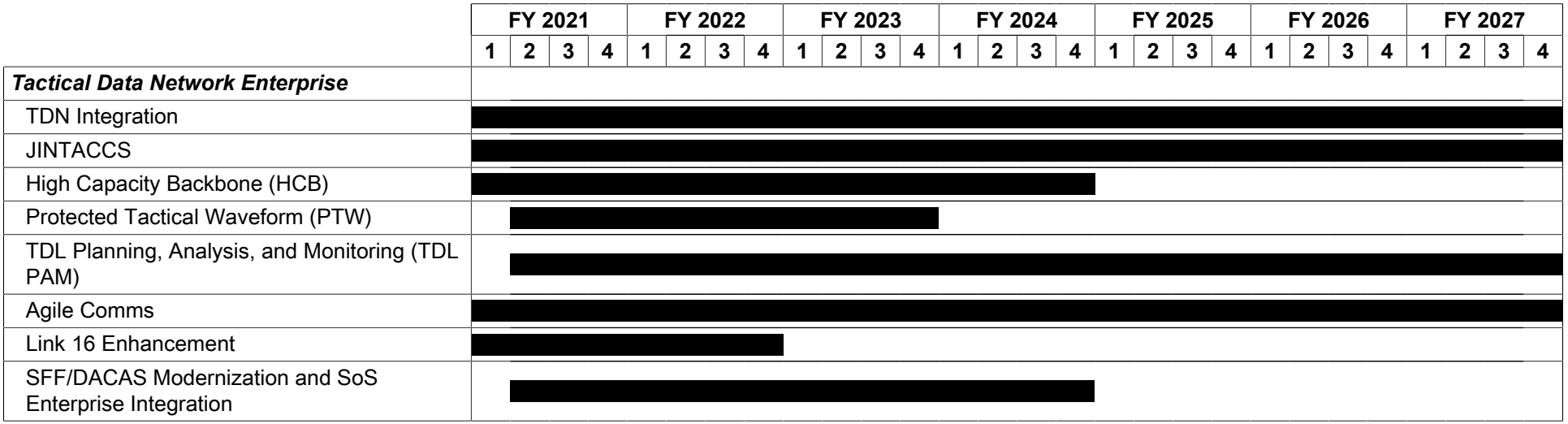

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604281F / *Tactical Data Networks Enterprise*	**Project (Number/Name)** 655050 / *TDL System Integration*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Tactical Data Network Enterprise				
TDN Integration	1	2021	4	2027
JINTACCS	1	2021	4	2027
High Capacity Backbone (HCB)	1	2021	4	2024
Protected Tactical Waveform (PTW)	2	2021	4	2023
TDL Planning, Analysis, and Monitoring (TDL PAM)	2	2021	4	2027
Agile Comms	1	2021	4	2027
Link 16 Enhancement	1	2021	4	2022
SFF/DACAS Modernization and SoS Enterprise Integration	2	2021	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604281F / *Tactical Data Networks Enterprise*	Project (Number/Name) 655262 / *Family of Gateways*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
655262: *Family of Gateways*	-	11.541	50.584	0.000	0.000	0.000	0.000	0.000	0.000	0.002	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Family of Gateways provides for the study (acquisitions current and proposed), analysis, enhancement, development, integration, costing, demonstration, test, and evaluation efforts that will allow joint combat forces to exchange information quickly and accurately by bridging discrete airborne, terrestrial, maritime, and space-based C4ISR networks producing operational effects not possible within individual networks. Gateway functions include enabling interoperability between data formats, protocols, and communication mediums. Additionally, gateway functions extend the connectivity range, consolidate data from multiple networks into high capacity links for transmission to key C2ISR nodes, route information between disadvantaged users, and fuse/correlate data from multiple sources to improve accuracy. Gateway functions also provide application hosting, shared data storage, on-demand information access, smart data forwarding, and system monitoring and network management. Family of Gateways will support to enhance existing TDL performance, through upgrades and engineering analysis of system designs.

Efforts in this project include waveform, ground, and rapid acquisition activities supporting Air Force requirements for communications bridging across multiple platforms, sources and communication domains.
Funds in this BPAC, 655262, Family of Gateways will be used in BPAC 655050, TDL System Integration under the same PE 0604281, Tactical Data Networks Enterprise.

Activities also include studies, analysis, demonstrations and experiments to support both current program planning/execution and future program planning efforts for Family of Gateways or other applicable platforms to include but not limited to E-11 Battlefield Airborne Communications Node (BACN).

This program element may include necessary civilian pay expenses required to support, manage, execute, and deliver weapon system capabilities across the BACN platforms, aerial network, and tactical data network enterprise. 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 0.9M was expended for civilian pay expenses in this program element, and in CY 0.9M is forecasted for civilian pay expenses in this program element.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Protected Tactical Waveform (PTW)	11.541	50.584	0.000
Description: In FY 2022, PE 0604281F, TDNE, BPAC 655262, Family of Gateways efforts were transferred to PE 0604281F, TDNE, BPAC 655050, TDL System Integration, Project Protected Tactical Waveform (PTW) in order to further aerial terminals development and integration in Wide body, UAV and Fighter configurations.			
FY 2022 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604281F / *Tactical Data Networks Enterprise*	**Project (Number/Name)** 655262 / *Family of Gateways*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
- See plans in BPAC 655050, TDL System Integration. -Continue the development, integration and testing of an airborne modem that will be utilized by fighter and wide-body aircraft. -Develop a standards-based PTW modem with Anti-Jam (AJ) capability to augment existing Aerial SATCOM terminals across vendors and platforms. -Continue addition of COMSEC capability to allow use of classified data and fully certify the crypto to be able to encrypt data for multiple waveforms. ***FY 2023 Plans:*** Funding moved to BPAC 655050 ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding moved to BPAC 655050			
Accomplishments/Planned Programs Subtotals	11.541	50.584	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• RDTE 07 PE 0207448F: *C2ISR TDL*	1.559	1.587	1.616	-	1.616	-	-	-	-	Continuing	Continuing
• APAF 05 Line Item F01500: *F-15*	40.167	20.933	21.310	-	21.310	-	-	-	-	Continuing	Continuing
• APAF 05 Line Item F01600: *F-16*	8.525	8.695	8.851	-	8.851	-	-	-	-	Continuing	Continuing
• APAF 05 Line Item B00200: *B-2A*	0.206	0.210	0.213	-	0.213	-	-	-	-	Continuing	Continuing
• APAF 05 Line Item B01B00: *B-1B*	0.000	0.000	0.000	-	0.000	-	-	-	-	Continuing	Continuing
• OPAF 03 Line Item 834010: *General Information Technology*	1.698	1.701	1.731	-	1.731	-	-	-	-	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Airborne Networking Directorate provides for common development, integration and interoperability across the entire airborne network and ensures that data links are procured and maintained as a joint, end-to-end, command and control system. Platform acquisition strategies vary by program, but the majority of development and integration is normally accomplished by the weapon system prime contractor. Contract approaches vary by program.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604281F / *Tactical Data Networks Enterprise*	Project (Number/Name) 655262 / *Family of Gateways*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
5th to 4th Development	SS/CPAF	Not specified. : TBD	-	11.541	Dec 2020	-		-		-		-	Continuing	Continuing	-
Protected Tactical Waveform	TBD	Not specified. : TBD	-	-		50.584	Jan 2022	-		-		-	Continuing	Continuing	-
		Subtotal	-	11.541		50.584		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	11.541		50.584		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604281F / *Tactical Data Networks Enterprise*	**Project (Number/Name)** 655262 / *Family of Gateways*

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
5th-to-4th Generation Gateway																												
5th-to-4th Generation Gateway Development																												

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604281F / *Tactical Data Networks Enterprise*	**Project (Number/Name)** 655262 / *Family of Gateways*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
5th-to-4th Generation Gateway				
5th-to-4th Generation Gateway Development	1	2021	3	2021

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604287F / *Physical Security Equipment*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	5.979	8.469	8.493	0.000	8.493	10.374	10.489	10.956	11.199	Continuing	Continuing
655120: *Physical Security Equipment - SD ED*	-	5.979	8.469	8.493	0.000	8.493	10.374	10.489	10.956	11.199	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Physical Security Equipment (PSE) program provides for Air Force Integrated Base Defense Security Systems (IBDSS) improvements and enhancements, to include the demonstration and testing of PSE systems related to Force Protection. This program supports the protection of tactical, fixed, and nuclear weapons systems, AF personnel and AF facilities. The PSE program includes spectrum planning for radio frequency (RF), communication security (cyber), information assurance requirements, integration and interoperability command control & communication (3) platform & components. This Program Element also includes funding for Force Protection Commercial Off the Shelf (FP COTS) equipment, market research, evaluation and testing. Force Protection programs are inherently subject to rapid changes in the operational environment and will retain sufficient Program flexibility to meet changes in location, scope and capability in order to protect Air Force people, facilities and warfighting assets. The Defender Multi-Domain Command, Control and Communications (DMDC3) is an initiative developing the foundational structure of IBDSS to provide a platform that integrates the computing power, the means of communication, and the tools for situational awareness. PSE efforts support Modular Open Source Architecture (MOSA) standards to enable faster installations and greater interoperability to address the Chief of Staff of the Air Force (CSAF's) ‘Fight the Base' goals.

IBDSS FY23 developmental efforts will continue to evaluate and test state-of-the-art technology to support integrated based defense systems installations worldwide, continue to improve and integrate COTS efforts into IBDSS physical security equipment, and further develop, integrate and test Defender Multi-Domain Command, Control and Communications (DMDC3) software applications. IBDSS-3 expands upon and scales IBDSS modernization efforts first developed under IBDSS-2. Capability improvements include zero-trust architecture, ML/AI integration, expanded sensor capabilities, UAS/UGV integration, and improved mobile C3.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Base Physical Security System capabilities 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 0605831F, 0605827F, 0605828F, 0605829F, 0605832F, 0605833F, 0605898F, 0606398F. In FY21 0.665M was expended for civilian pay expenses in this program element. In FY22 1.158M is forecasted for civilian pay expenses in this program element.

This requirement supports performance of a full financial audit as required by title 10 U.S.C. Chapter 9A, Sec 240-D.

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604287F / *Physical Security Equipment*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	6.740	8.469	0.000	0.000	0.000
Current President's Budget	5.979	8.469	8.493	0.000	8.493
Total Adjustments	-0.761	0.000	8.493	0.000	8.493
• 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	-0.615	0.000			
• SBIR/STTR Transfer	-0.146	0.000			
• Other Adjustments	0.000	0.000	8.493	0.000	8.493

Change Summary Explanation

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: IBDSS-2	5.979	8.469	0.000

Description: IBDSS-2 (Integrated Base Defense Security Systems) qualifies, demonstrates, and tests Physical Security Equipment (PSE) systems to include Force Protection.

FY 2022 Plans:

-Continuing to conduct market research, evaluation and testing to address capability gaps and obsolescence to include, but not limited to Force Protection Commercial Off The Shelf (COTS).
-Continuing integration and testing to qualify COTS equipment to provide essential upgrades/improvements and state-of-the-art technology to support integrated based security systems installations worldwide.
-Continuing with the integration and/or modification to COTS efforts to improve IBDSS physical security equipment.
-Continuing development, integration and testing Defender Multi-Domain Command, Control and Communications (DMDC3) software applications.

FY 2023 Plans:

N/A

FY 2022 to FY 2023 Increase/Decrease Statement:

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604287F / *Physical Security Equipment*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
IBDSS-2 ends and IBDSS-3 begins.			
Title: IBDSS-3	0.000	0.000	8.493
Description: IBDSS-3 (Integrated Base Defense Security Systems) qualifies, demonstrates, and tests Physical Security Equipment (PSE) systems to include Force Protection. ***FY 2022 Plans:*** N/A ***FY 2023 Plans:*** -Will continue to conduct market research, evaluation and testing to address capability gaps and obsolescence to include, but not limited to Force Protection Commercial Off The Shelf (COTS). -Will continue further integration and testing to qualify COTS equipment to provide essential upgrades/improvements and state-of-the-art technology to support integrated based security systems installations worldwide. -Will continue with the integration and/or modification of COTS efforts to improve IBDSS physical security equipment. -Will continue further development, integration and testing Defender Multi-Domain Command, Control and Communications (DMDC3) software applications. - Will continue integration of DMDC3 with external systems in order to meet ABMS/JADC2 directive. - Will continue to expand upon and scales IBDSS modernization efforts first developed under IBDSS-2 to include, but not limited to, zero-trust architecture, ML/AI integration, expanded sensor capabilities, UAS/UGV integration, and improved mobile C3. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** IBDSS-3 begins in FY23.			
Accomplishments/Planned Programs Subtotals	5.979	8.469	8.493

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• OPAF 03 Line Item 29: *Base Physical Security Systems*	37.477	44.812	49.370	-	49.370	83.386	97.102	98.134	63.959	Continuing	Continuing

Remarks

E. Acquisition Strategy

AFSFC and Force Protection program office investigates requirements to include new and/or obsolete items. COTS sub-systems, equipment and components are competitively acquired from industry after thorough market research. Equipment for testing is purchased via competitive selection processes via direct purchase orders.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604287F / *Physical Security Equipment*

For security systems COTS that are required to be qualified for nuclear security environments where industry COTS sources may not be mature, consideration is given to replacement of new items or modification of COTS through the competitive selection procedure as well.

Delivery Orders on Indefinite Delivery/Indefinite Quantity contract vehicles or other approved purchase methods are utilized to acquire equipment.

The Force Protection program office is developing new capabilities, updating existing capabilities, exploring and fielding COTS capabilities, primarily, but not exclusively through a Mid-Tier Acquisition program.

Notional strategy to deploy Defender Multi-Domain Command, Control and Communications (DMDC3) and IBDSS of the future. DMDC3 Pathfinder operations at Vindicator and Advantor IDS Systems at various bases.

Supports Modular Open Source Architecture (MOSA) standards to enable faster installations and greater interoperability to enable Chief of Staff of the Air Force (CSAF's) ‘Fight the Base' goals.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604287F / *Physical Security Equipment*	**Project (Number/Name)** 655120 / *Physical Security Equipment - SD ED*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Base Defense Security Systems (IBDSS-3)	Various	Various : Various	-	0.000		0.000		4.308	Dec 2022	-		4.308	Continuing	Continuing	-
Integrated Base Defense Security Systems (IBDSS-2)	Various	Various : Various	-	3.053	Mar 2021	4.091	Mar 2022	-		-		-	Continuing	Continuing	-
		Subtotal	-	3.053		4.091		4.308		-		4.308	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Base Defense Security Systems (IBDSS-3)	Various	Various : Various	-	0.000		0.000		1.787	May 2023	-		1.787	Continuing	Continuing	-
Integrated Base Defense Security Systems (IBDSS-2)	Various	Various : Various	-	0.491	Jul 2021	1.788	Apr 2022	-		-		-	Continuing	Continuing	-
Integrated Base Defense Security Systems (IBDSS-2) Direct Cite Authority	TBD	Not specified. : TBD	-	0.874		1.158	Apr 2022	-		-		-	Continuing	Continuing	-
		Subtotal	-	1.365		2.946		1.787		-		1.787	Continuing	Continuing	N/A

Remarks

The support funding is planned at the above amounts. If the support contracts are less, the available funds will be transitioned to the Product Development line.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604287F / *Physical Security Equipment*	**Project (Number/Name)** 655120 / *Physical Security Equipment - SD ED*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Base Defense Security Systems (IBDSS-3)	Various	Various : Various	-	0.000		0.000		2.398	Dec 2022	-		2.398	Continuing	Continuing	-
Integrated Base Defense Security Systems (IBDSS-2)	Various	Various : Various	-	1.561	Apr 2021	1.432	Jan 2022	-		-		-	Continuing	Continuing	-
		Subtotal	-	1.561		1.432		2.398		-		2.398	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	5.979		8.469		8.493		-		8.493	Continuing	Continuing	N/A

Remarks

Various delivery orders will be awarded through out the fiscal year for numerous projects.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604287F / *Physical Security Equipment*	**Project (Number/Name)** 655120 / *Physical Security Equipment - SD ED*

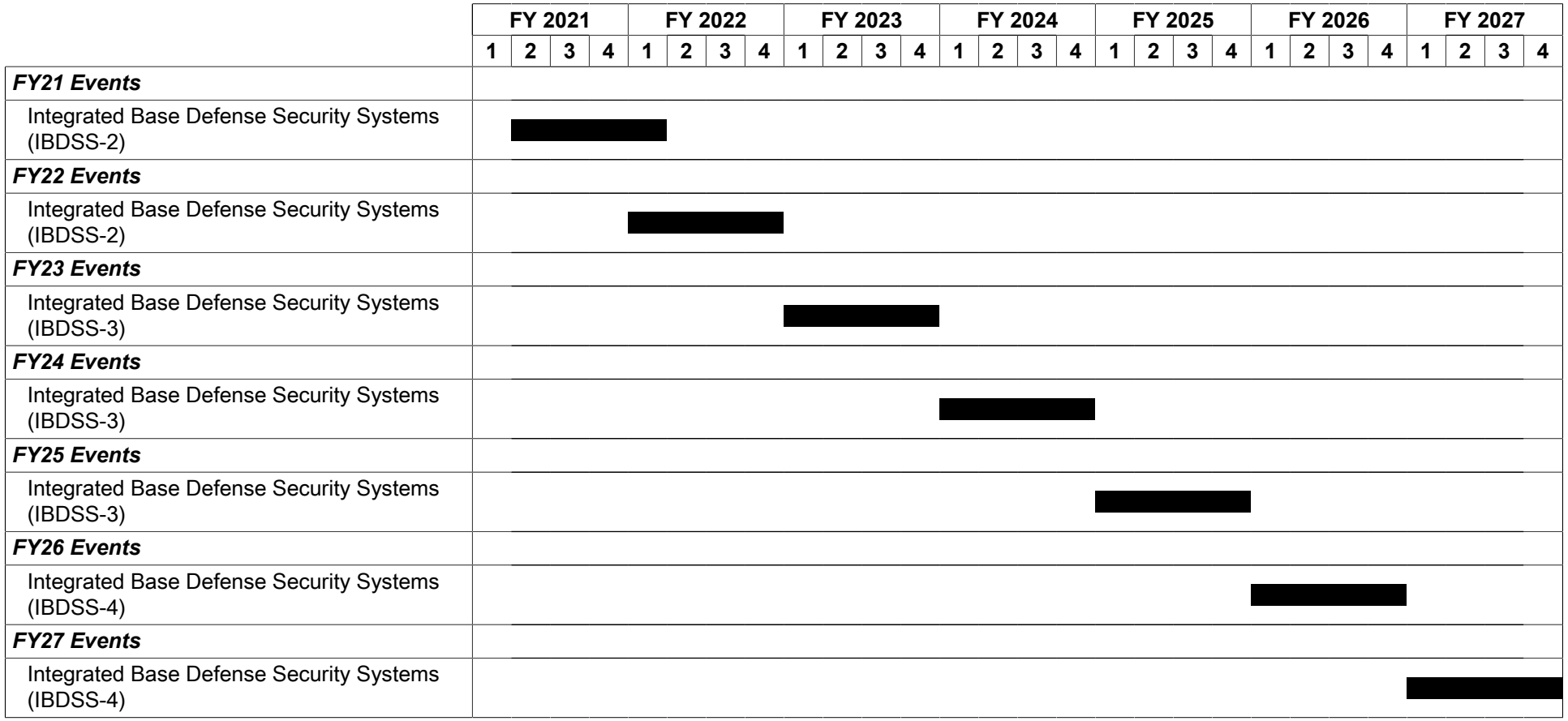

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604287F / *Physical Security Equipment*	**Project (Number/Name)** 655120 / *Physical Security Equipment - SD ED*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
FY21 Events				
Integrated Base Defense Security Systems (IBDSS-2)	2	2021	1	2022
FY22 Events				
Integrated Base Defense Security Systems (IBDSS-2)	1	2022	4	2022
FY23 Events				
Integrated Base Defense Security Systems (IBDSS-3)	1	2023	4	2023
FY24 Events				
Integrated Base Defense Security Systems (IBDSS-3)	1	2024	4	2024
FY25 Events				
Integrated Base Defense Security Systems (IBDSS-3)	1	2025	4	2025
FY26 Events				
Integrated Base Defense Security Systems (IBDSS-4)	1	2026	4	2026
FY27 Events				
Integrated Base Defense Security Systems (IBDSS-4)	1	2027	4	2027

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604602F / *Armament/Ordnance Development*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	20.199	9.047	5.279	0.000	5.279	6.973	7.102	7.254	7.415	Continuing	Continuing
653133: *Bombs & Fuzes*	-	15.134	3.950	1.134	0.000	1.134	1.498	1.525	1.558	1.592	Continuing	Continuing
655361: *Stores-Aircraft Interface*	-	5.065	5.097	4.145	0.000	4.145	5.475	5.577	5.696	5.823	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Armament Ordnance Development program provides for the initial and continuing development of weapons, munitions, and munitions equipment for aircraft integration, support, and operational use. This program develops, characterizes, and improves current, future, and legacy munitions, ammunitions, and subsystems.

653133: The Bombs & Fuzes project improves conventional weapons/munitions (kinetic and non-kinetic), fuzes, and height-of-burst sensors (HOBS), and develops and integrates complementary common weapon components, data links, position, navigation, and timing (PNT) capabilities (i.e. GPS, non-GPS, optical, passive, active, etc.) using modern acquisition best practices, to include digital acquisition practices (e.g. government-owned open system architectures, Model Based Systems Engineering (MBSE) and agile software development). It also provides for the development and testing necessary for a suitable manufacturing base of conventional warheads, fuzes, HOBS, and munitions material handling equipment (MMHE). Bombs & Fuzes also provides research, development, testing and guidance of conventional warheads, fuzing, HOBS modifications, and anti-personnel anti-materiel (APAM) weapons to improve lethality and survivability against area, mobile, hard and deeply buried, and fixed targets. Finally, this project provides an opportunity to quickly insert emerging technologies into existing and developing aircraft munitions and fuzes and supports strategic planning to achieve compliance of AF munitions with Department of Defense insensitive munitions (IM) standards

655361: The Stores-Aircraft Interface project is home to the Universal Armament Interface (UAI). UAI is the Air Force's common standard aircraft/weapon interface and is an acquisition requirement, to be used by all weapons and combat aircraft as practicable. The UAI program continues development and maintenance of the standardized interface including mission planning components. Users include Air Force, Army, and Navy customers. The UAI program office is also responsible for development, enhancement, and maintenance of the standard to support coalition, allied, and joint interoperability efforts for weapons-platform interface. These responsibilities include acquisition, upgrade, repair and provision of UAI certification tools, and implementation support to US Air Force, Army, Navy and allied aircraft and weapons systems. UAI provides cost/schedule savings over traditional integration efforts. This is accomplished by enabling integration of weapons independent of aircraft Operational Flight Programs (OFP) cycles. UAI incorporates complex info such as: power management, target info, waypoints, flight/trajectory profile, fusing, launch parameters, verification of data sent/received, sensor info, and propulsion profiles.

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 0605831F. In FY22 0.186M was expended for civilian pay expenses in this program element, and in FY23 0.240M 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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force					Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0604602F / *Armament/Ordnance Development*		
B. Program Change Summary ($ in Millions)	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**
Previous President's Budget	23.034	9.047	0.000	0.000	0.000
Current President's Budget	20.199	9.047	5.279	0.000	5.279
Total Adjustments	-2.835	0.000	5.279	0.000	5.279
• 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	-2.000	0.000			
• SBIR/STTR Transfer	-0.835	0.000			
• Other Adjustments	0.000	0.000	5.279	0.000	5.279

Change Summary Explanation

The FY2022 President's Budget submittal did not reflect FY2023 through FY2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

$2M below-threshold-reprogramming to Hard and Deeply Buried Target Defeat System (PE 0604327F)

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604602F / *Armament/Ordnance Development*	Project (Number/Name) 653133 / *Bombs & Fuzes*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
653133: *Bombs & Fuzes*	-	15.134	3.950	1.134	0.000	1.134	1.498	1.525	1.558	1.592	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Bombs & Fuzes project improves conventional weapons/munitions (kinetic and non-kinetic), fuzes, and height-of-burst sensors (HOBS), and develops and integrates complementary common weapon components, data links, position, navigation, and timing (PNT) capabilities (i.e. GPS, non-GPS, optical, passive, active, etc.) using modern acquisition best practices, to include digital acquisition practices (e.g. government-owned open system architectures, Model Based Systems Engineering (MBSE) and agile software development). It also provides for the development and testing necessary for a suitable manufacturing base of conventional warheads, fuzes, HOBS, and munitions materiel handling equipment (MMHE). Bombs & Fuzes also provides research, development, testing and guidance of conventional warheads, fuzing, HOBS modifications, and anti-personnel anti-materiel (APAM) weapons to improve lethality and survivability against area, mobile, hard and deeply buried, and fixed targets. Finally, this project provides an opportunity to quickly insert emerging technologies into existing and developing aircraft munitions and fuzes and supports strategic planning to achieve compliance of AF munitions with Department of Defense insensitive munitions (IM) standards

- Munitions Materiel Handling Equipment (MMHE): MMHE is a continuing project to develop and improve the standardization and commonality of munitions handling and armament equipment to preclude duplication. Efforts are primarily the study, design, and development of MMHE and armament control systems; however, support may be provided to other functional areas as requested. Procurement will be performed and funded by the applicable weapons system project.

- Medium Caliber Ammunition project assesses, refines, and develops medium caliber ammunition, to include, but not limited to, conducting 25mm (F-35) qualification testing, comparative testing, and mitigating ammunition inventory health issues.

- Insensitive Munitions (IM) and Emerging Technologies: IM projects support AF IM strategic planning to achieve IM compliance IAW U.S. Code, Title 10, Subtitle A, Part N, Chapter 141, Section 2389, ensuring safety regarding insensitive munitions. Models and validates current munition performance, integrates less sensitive explosive fills, addresses IM explosive fill deficiencies, and develops bomb case modifications to improve the response of conventional weapons to unplanned stimuli. This project also explores and develops IM and Energetics technology, assessing, analyzing, and evaluating emerging and developed technologies for future and existing weapon and fuze capabilities to improve lethality, accuracy, and reliability in accordance with the National Defense Strategy roadmap.

- Next Generation Area Attack Weapons (NGAAWs) are a family of unitary area attack weapon capabilities to meet the DoD policy regarding cluster munitions and unintended harm to civilians. They consist of BLU-134/B and BLU-136/B warheads with a height of burst sensor. BLU-134/B Improved Lethality Warhead (ILW), NGAAW Increment I, is a near-term solution for area attack as an anti-personnel anti-materiel (APAM) weapon that improves lethality using a 500 lb warhead design and any variants. The BLU-136/B NGAAW Increment II continues development to provide significantly increased capability and lethality against area targets as an APAM weapon. This effort is being executed using an accelerated acquisition strategy to study, design, develop, and test a 2,000 lb unitary warhead design and any variants based on target sets.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604602F / *Armament/Ordnance Development*	**Project (Number/Name)** 653133 / *Bombs & Fuzes*

- DSU-43/B Cockpit-selectable Height-Of-Burst Sensor (C-HOBS): The C-HOBS will be a replacement for the current DSU-33D/B proximity sensor. C-HOBS will replace the single factory height-of-burst setting with the addition of multiple height-of-burst options selectable via both manual switches and a cockpit interface. These selection options allow flexibility during flight to address a wide array of targets. The C-HOBS is intended to interface with Combat Air Forces (CAF) aircraft and provide proximity height-of-burst functionality to general and special purpose weapons (to include NGAAWs).

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 0605831F. In FY21 0.186M was expended for civilian pay expenses in this program element, and in FY22 0.240M is forecasted for civilian pay expenses in this program element.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Munitions Materiel Handling Equipment (MMHE)	4.741	0.664	0.700	0.000	0.700
Description: Armament Standardization/Control/Munitions Materiel Handling Equipment (MMHE) is a continuing project to develop and improve the standardization and commonality of munitions handling and armament equipment to preclude duplication. Efforts are primarily the study, design, and development of MMHE and armament control systems; however, support may be provided to other functional areas as requested. Procurement will be performed and funded by the applicable weapons system project. ***FY 2022 Plans:*** MMHE support projects to include engineering, drafting, proof load, technical data, and safety authorizations. Fabricate prototypes for test and evaluation purposes. Continue first article equipment fabrications for drafting verification and delivery to Air Force units for additional test and evaluation. Provide support to all system program offices with new weapons and aircraft configurations, as needed. Continue support to the F-35 with designs and manufacturing of equipment to aid safe munitions loading and handling of various pylons and adapters. Continue to support the B-21 program office with evaluations and recommendations for equipment to aid safe munitions loading and handling of various pylons and adapters. Continue support to DARPA with designs and manufacturing of equipment to aid safe munitions loading and handling of hypersonic weapons. Continue support for Air Force Research Laboratory on future munition concept demonstrators. ***FY 2023 Base Plans:*** Continuation of MMHE support projects to include engineering, drafting, proof load, technical data, and safety authorizations. Fabricate prototypes for test and evaluation purposes. Continue first article equipment fabrications for drafting verification and delivery to Air Force units for additional test and evaluation. Provide support to all system program offices with new weapons and aircraft configurations, as needed. Continue support to the F-35 with designs and manufacturing of equipment to aid safe munitions loading and					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604602F / *Armament/Ordnance Development*	**Project (Number/Name)** 653133 / *Bombs & Fuzes*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
handling of various pylons and adapters. Continue to support the B-21 program office with evaluations and recommendations for equipment to aid safe munitions loading and handling of various pylons and adapters. Continue support to DARPA with designs and manufacturing of equipment to aid safe munitions loading and handling of hypersonic weapons. Continue support for Air Force Research Laboratory on future munition concept demonstrators. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increase due to an increase of projects, design and/or re-design of drawings will increase the overall number of active projects during this FY and an increase of cost to metal and distribution.					
Title: Medium Caliber Ammunition ***Description:*** The Medium Caliber Ammunition efforts support the warfighter's medium caliber ammunition research, development, test, and evaluation (RDT&E) requirements, DoN/USAF collaboration for the medium caliber family of ammunition, foreign comparative testing, inventory health challenges, procurement of ammunition, and other emerging technologies. ***FY 2022 Plans:*** Continue to provide engineering and technical support for PGU-48/B rounds as well as further comparative testing/EMD of alternative products/sources. Assess and mitigate Medium Caliber ammunition inventory health challenges. ***FY 2023 Base Plans:*** Continue to provide engineering and technical support for PGU-48/B rounds as well as further comparative testing/EMD of alternative products/sources. Assess and mitigate Medium Caliber ammunition inventory health challenges. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A	0.100	0.100	0.100	0.000	0.100
Title: Insensitive Munitions (IM) and Emerging Technology	0.986	0.300	0.334	0.000	0.334

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604602F / *Armament/Ordnance Development*	**Project (Number/Name)** 653133 / *Bombs & Fuzes*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Description: Model and validate current munition performance; explore and develop IM and Energetics technology; assess, analyze, and evaluate emerging and developed technologies for future and existing weapon and fuze capabilities to improve lethality, accuracy, and reliability in accordance with the National Defense Strategy roadmap. ***FY 2022 Plans:*** Provide modeling and engineering technical guidance to ensure munitions are as safe as practical; evaluate, explore, and appraise evolving and improve these technologies for future and existing weapons, fuze capabilities, and strategic planning. ***FY 2023 Base Plans:*** Continue to provide guidance to ensure munitions are as safe as practical to include; assessing, analyzing, and evaluating emerging and future development of technologies in our weapons. Enhance and evolve direct attack weapon capabilities by identifying new technology through collaboration with industry, academia, and other government stakeholders and uniting specialized expertise. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increase due to variations development costs, increases to support to include direct cite authorization assigned to the program and continued emerging technology requirements.					
Title: Cockpit-Selectable Height-Of-Burst Sensor (C-HOBS) ***Description:*** DSU-43/B Cockpit-selectable Height-Of-Burst Sensor (C-HOBS). The C-HOBS will be a replacement for the legacy DSU-33D/B proximity sensor. C-HOBS will replace the single factory height-of-burst setting with the addition of multiple height-of-burst options selectable via both manual switches and a cockpit interface. These selection options allow flexibility during flight to address a wide array of targets. The C-HOBS is intended to interface with the weapon via the cockpit and provide a cockpit-selectable proximity function for general and special purpose weapons (to include Next Generation Area Attack Weapons, NGAAWs). ***FY 2022 Plans:***	9.249	2.886	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604602F / *Armament/Ordnance Development*	**Project (Number/Name)** 653133 / *Bombs & Fuzes*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Complete design and qualification tests; and integration work. Conduct government/industry reviews working towards completion of Milestone C efforts. Start Low Rate Initial Production and First Article Acceptance Testing with a Full-Rate Production Decision. Pending MDA approval of FRP, will start full-rate production. ***FY 2023 Base Plans:*** N/A ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreased because CHOBS will complete EMD and transition to production.					
Title: Next Generation Area Attack Weapons (NGAAWs) ***Description:*** Next Generation Area Attack Weapons (NGAAWs) are a family of unitary area attack weapon capabilities to meet the DoD policy regarding cluster munitions and unintended harm to civilians. They consist of BLU-134/B and BLU-136/B warheads with a height of burst sensor. BLU-134/B Improved Lethality Warhead (ILW),NGAAW Increment I, is a near-term solution for area attack as an anti-personnel anti-materiel (APAM) weapon that improves lethality using a 500 lb warhead design and any variants. The BLU-136/B NGAAW Increment II continues development to provide significantly increased capability and lethality against area targets as an APAM weapon. This effort is being executed using an accelerated acquisition strategy to study, design, develop, and test a 2,000 lb unitary warhead design and any variants based on target sets. ***FY 2022 Plans:*** N/A ***FY 2023 Base Plans:*** N/A ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A	0.058	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	15.134	3.950	1.134	0.000	1.134

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
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C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• PAAF 01 Line Item 353020: *General Purpose Bombs*	369.566	176.565	156.385	0.000	156.385	135.827	133.749	164.925	169.000	Continuing	Continuing
• PAAF 01 Line Item 356120: *Fuzes*	102.918	50.795	121.528	0.000	121.528	108.824	146.904	149.869	152.938	Continuing	Continuing
• PAAF 01 Line Item 352010: *Cartridges*	157.799	169.163	119.698	10.825	130.523	97.062	109.630	112.163	114.650	Continuing	Continuing

Remarks

N/A

D. Acquisition Strategy

- Fuzes (including C-HOBS) is a continuing effort with most activities performed through contracted services.

- Munitions Materiel Handling Equipment (MMHE) project activities are performed in-house with limited technical and analysis contract support.

- Medium Caliber Ammunition project activities are performed in-house with technical and analysis contract support, organic government test support, and possible contracted services (small contracts).

- Insensitive Munitions project activities are performed in-house with limited technical and analysis contract support

-Emerging Technologies are innovative efforts with most activities performed through various contracted services such as OTA's and DOTC; a limited number of activities such as technical analysis and test are performed by organic resources and support contractors.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Emerging Technology/IM	Various	Various : Eglin AFB, FL	-	0.740	Mar 2021	0.000	Mar 2022	0.029	Mar 2023	-		0.029	Continuing	Continuing	-
MMHE - Prototypes	Various	Prototype Fabrication Shop : Eglin AFB, FL	-	4.544	Apr 2021	0.359	Jan 2022	0.428	Jan 2023	-		0.428	Continuing	Continuing	-
CHOBS - HW/SW	C/Various	Various : Eglin AFB, FL	-	5.897	Oct 2020	0.000	Oct 2021	-		-		-	Continuing	Continuing	-
		Subtotal	-	11.181		0.359		0.457		-		0.457	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MMHE - Shipping/Supplies	Various	MMHE Program Office : Eglin AFB, FL	-	0.034	Mar 2021	0.032	Nov 2021	0.042	Nov 2022	-		0.042	Continuing	Continuing	-
DCA Civ Pay (653133)	Allot	AFLCMC/EBD : Eglin AFB, FL	-	0.186	Oct 2020	0.240	Oct 2021	0.240	Oct 2022	-		0.240	Continuing	Continuing	-
		Subtotal	-	0.220		0.272		0.282		-		0.282	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CHOBS - Test and Evaluation	C/Various	Various : Various	-	1.065	Oct 2020	2.886	Oct 2021	-		-		-	Continuing	Continuing	-
MMHE - Test Support	PO	96 TW : Eglin AFB, FL	-	0.062	Nov 2020	0.030	Nov 2021	0.025	Nov 2022	-		0.025	Continuing	Continuing	-
Emerging Technology - Test Wing	PO	96 TW : Eglin AFB, FL	-	0.040	Sep 2021	-		-		-		-	Continuing	Continuing	-
NGAAW- Test and Evaluation	PO	96 TW : Eglin AFB, FL	-	0.058	Nov 2020	-		-		-		-	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
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Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	1.225		2.916		0.025		-		0.025	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
IM and Emerging Technology- PMA	Various	Various : Eglin AFB, FL	-	0.021		0.060	Dec 2021	0.065	Dec 2022	-		0.065	Continuing	Continuing	-
Medium Caliber - PMA	Various	Various : Eglin AFB, FL	-	0.100	Jun 2021	0.100	Jun 2022	0.100	Jun 2023	-		0.100	Continuing	Continuing	-
MMHE - PMA	Various	Various : Eglin AFB, FL	-	0.100	Jun 2021	0.243	Mar 2022	0.205	Mar 2023	-		0.205	Continuing	Continuing	-
CHOBS - PMA	Various	Various : Eglin AFB, FL	-	2.287	Oct 2020	0.000	Oct 2021	-		-		-	Continuing	Continuing	-
		Subtotal	-	2.508		0.403		0.370		-		0.370	Continuing	Continuing	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	15.134		3.950		1.134		-		1.134	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604602F / *Armament/Ordnance Development*	**Project (Number/Name)** 653133 / *Bombs & Fuzes*

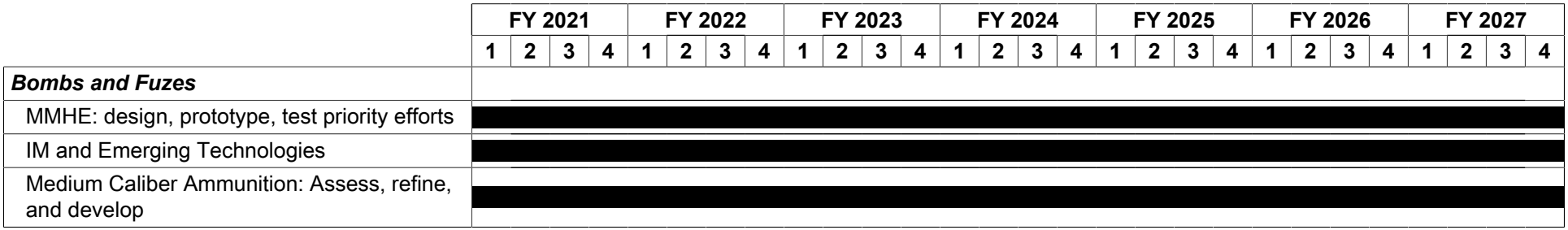

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604602F / *Armament/Ordnance Development*	**Project (Number/Name)** 653133 / *Bombs & Fuzes*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Bombs and Fuzes				
MMHE: design, prototype, test priority efforts	1	2021	4	2027
IM and Emerging Technologies	1	2021	4	2027
Medium Caliber Ammunition: Assess, refine, and develop	1	2021	4	2027

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604602F / *Armament/Ordnance Development*	Project (Number/Name) 655361 / *Stores-Aircraft Interface*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
655361: *Stores-Aircraft Interface*	-	5.065	5.097	4.145	0.000	4.145	5.475	5.577	5.696	5.823	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

655361: The Stores-Aircraft Interface conducts stores-aircraft interface upgrades and standards development to include the Universal Armament Interface (UAI). UAI is the Air Force's standardized interface for aircraft weapons and mission planning, and its use is mandated by SAF/AQ. The savings realized from this effort is on average 6 years of schedule and $22M per aircraft/weapon combination. This is accomplished by enabling integration of weapons independent of aircraft Operational Flight Programs (OFP) cycles. UAI is currently implemented on the F-15E, F-16 Block 40/50 and European Participating Air Forces (EPAF) F-16 aircraft, F/A-18, Small Diameter Bomb (SDB) I and II, Joint Direct Attack Munition (JDAM)(all variants), Laser JDAM, Joint Air-to-Surface Stand-off Missile (JASSM), Enhanced Paveway II, Joint Mission Planning System (JMPS) and Precision Guided Munitions Planning Software (PGMPS). Planned implementations include Joint Strike Fighter (JSF/F-35), B-21, B-52, AC-130J, F-15EX, MQ-9, JASSM-Extended Range (JASSM-ER), Advanced Anti-Radiation Guided Missile - Extended Range (AARGM-ER), Stand-in Attack Weapon (SiAW), Long Range Anti-Ship Missile (LRASM), Grey Wolf, Combat Weapons Delivery Software (CWDS), Select Precision Effects At Range Capability 3 (SPEAR3), Joint Strike Missile (JSM), Navy Open Mission Systems (NOMS) for mission planning. The UAI program office is responsible for development and enhancement of the UAI standard to maintain technical currency, support to coalition/allied/joint interoperability efforts for weapons-platform interface, provision of certification tools, and implementation support to aircraft and weapons.

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 0605831F. In FY21 0.183M was expended for civilian pay expenses in this program element, and in FY22 0.195M is forecasted for civilian pay expenses in this program element.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Universal Armament Interface (UAI) Development	5.065	5.097	4.145	0.000	4.145
Description: Continue development and maintenance of the Air Force's mandated aircraft/weapon interface, to include UAI Mission Planning and Launch Acceptability Region (LAR) components.					
FY 2022 Plans: Continue development and configuration management of UAI in response to evolving requirements including ongoing transition of mission planning to Navy Open Mission Systems (NOMS) operating environment. Ongoing air-to-ground integration support includes all USAF weapons and aircraft, and includes USN and US Army customers. Development support will include advanced carriage systems, certification tool software upgrades and initial requirements investigation for hypersonic based systems. Support working groups, technical					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604602F / *Armament/Ordnance Development*	**Project (Number/Name)** 655361 / *Stores-Aircraft Interface*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
meetings and workshops, risk reduction assessments, common mission planning, and platform-specific implementation of UAI. Maintain and logistically support existing certification tools (within program budgetary limits) to meet current and future user system integration lab test certification needs. These tools are shared among aircraft and weapons programs to reduce time and cost for UAI integration efforts. Support international efforts including but not limited to Joint Strike Missile (JSM), and Select Precision Effects At Range Capability 3 (SPEAR3), and ongoing efforts to develop/implement a multinational Memorandum of Understanding. ***FY 2023 Base Plans:*** Continue development and fielding of UAI software improvements including updates to enhance and standardize geospatial zones implementation, GPS and M-code improvements, and smart carriage system interactions. In addition, the program will continue to develop the Mission Planning UAI Common Component with the transition from the Joint Mission Planning System (JMPS) to the Navy Open Mission Systems (NOMS) operating environment. UAI updates will include continued development of the Launch Acceptability Region (LAR) tool-set required by weapon systems and mission planning developers for generation of weapon performance truth data, engagement envelopes, training tools, and support way-point flying munitions. FY23 includes funding for ongoing air-to-ground integration support across USAF, USN, and Army customers, including development support for advanced carriage systems as store quantities and management capabilities increase, hypersonic weapons, and certification tool software updates. Support working groups, technical meetings and workshops, risk reduction assessments, common mission planning, and system-specific implementations of UAI. Maintain and logistically support existing certification tools to meet current and future user system integration lab test certification needs. These tools are shared among aircraft and weapon programs to reduce time and cost for UAI integration efforts. Support international efforts including but not limited to Joint Strike Missile (JSM) and Select Precision Effects At Range - Capability 3 (SPEAR3), both of which are integrating on the F-35 using UAI Platform Store Interface Control Document Rev 05, and implementing the multinational Memorandum of Understanding. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreased due to availability of prior year funds across the program element.					
Accomplishments/Planned Programs Subtotals	5.065	5.097	4.145	0.000	4.145

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604602F / *Armament/Ordnance Development*	**Project (Number/Name)** 655361 / *Stores-Aircraft Interface*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

N/A

D. Acquisition Strategy

In December 2004, under the authority of a class Justification and Approval (J&A), the UAI program office awarded individual Cost Plus Fixed Fee (CPFF) contracts to Boeing, Lockheed Martin, Northrop Grumman, and Raytheon. Each Original Equipment Manufacturer is responsible for a different piece of the total UAI requirement based on its product-specific (platform/weapon) expertise. During FY10, the original contracts expired. Under the authority of a class J&A, Cost Plus Incentive Fee (CPIF) contracts were awarded to the four UAI vendors in August 2010. Follow-on period of performance was awarded in March 2014 for 16 months to better align future contract awards with funding through the Future Years Defense Program. The period of performance was extended to 1 November 2015 to allow immediate start of the effort on F-35/JSF request for changes. A new J&A was approved in January 2015 for the follow-on sole-source contracts to the original equipment manufacturers (OEMs). These new sole-source contracts were awarded in November 2015 and expired in November 2019. A new J&A was signed in December 2018, prior to contract expiration, and four new five-year sole-source contracts (CPFF) were awarded in November 2019.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604602F / *Armament/Ordnance Development*	**Project (Number/Name)** 655361 / *Stores-Aircraft Interface*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Interface Control Document (ICD) Development/Updates/ Maintenance	SS/ Various	Boeing Northrop Grumman Lockheed Martin Raytheon : Various	-	4.861	Nov 2020	4.891	Nov 2021	3.940	Nov 2022	-		3.940	Continuing	Continuing	-
		Subtotal	-	4.861		4.891		3.940		-		3.940	Continuing	Continuing	N/A

Remarks

New 5 year Follow-on contract was awarded in November 2019.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
A&AS Contractor Support	Various	Various : Various	-	0.144	Dec 2020	0.146	Jun 2022	0.148	Jun 2023	-		0.148	Continuing	Continuing	-
Program Office Travel	C/CPAF	Not specified. : TBD	-	0.060		0.060		0.057		-		0.057	Continuing	Continuing	-
		Subtotal	-	0.204		0.206		0.205		-		0.205	Continuing	Continuing	N/A

Remarks

PE Systems Contractor provides support to the Program Office for financial services.

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	5.065		5.097		4.145		-		4.145	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604602F / *Armament/Ordnance Development*	**Project (Number/Name)** 655361 / *Stores-Aircraft Interface*

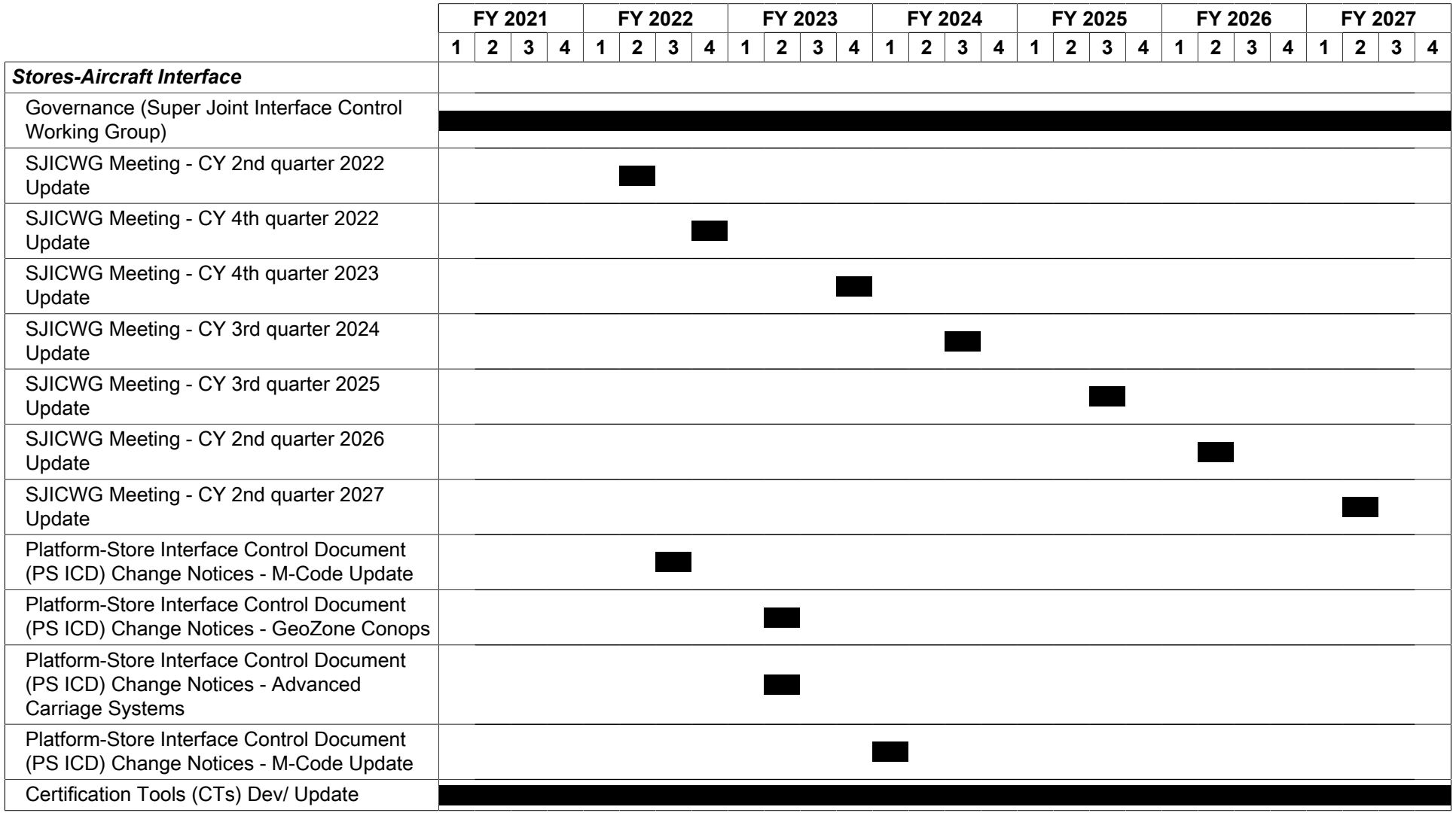

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604602F / *Armament/Ordnance Development*	**Project (Number/Name)** 655361 / *Stores-Aircraft Interface*

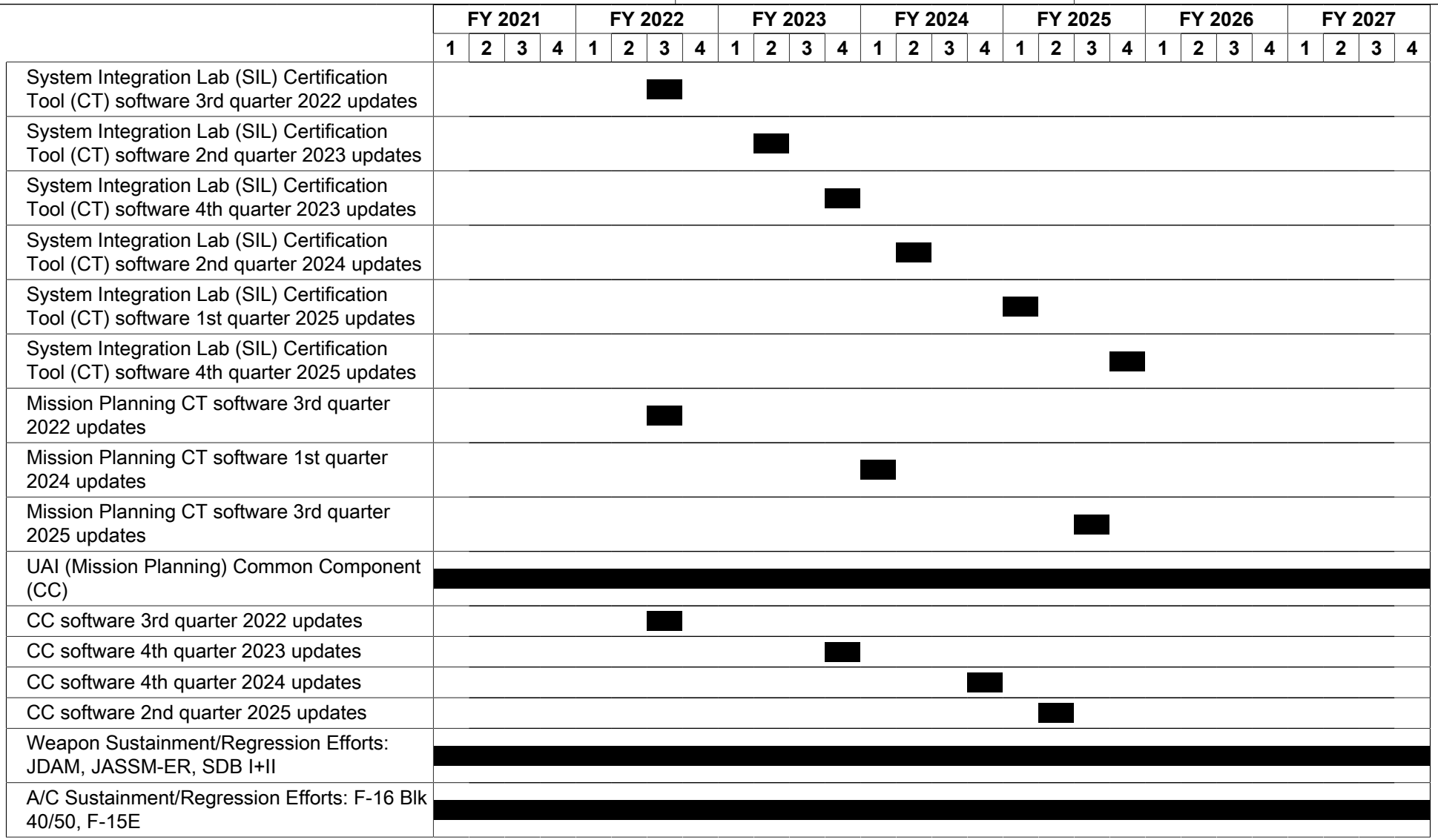

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604602F / *Armament/Ordnance Development*	**Project (Number/Name)** 655361 / *Stores-Aircraft Interface*

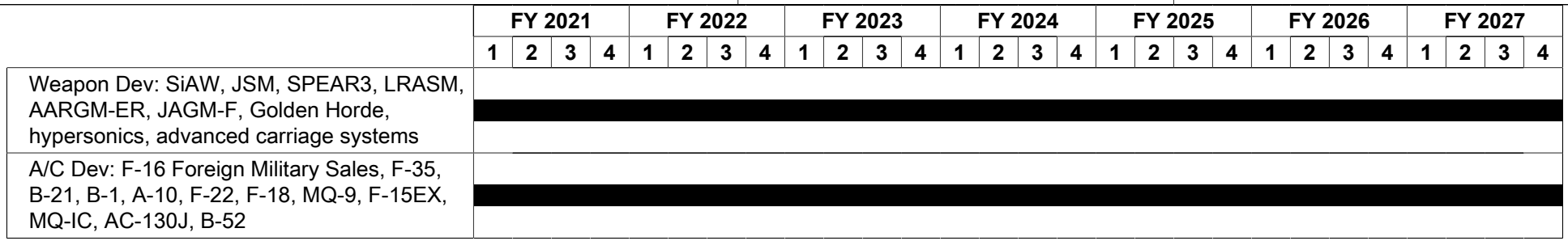

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604602F / *Armament/Ordnance Development*	**Project (Number/Name)** 655361 / *Stores-Aircraft Interface*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Stores-Aircraft Interface				
Governance (Super Joint Interface Control Working Group)	1	2021	4	2027
SJICWG Meeting - CY 2nd quarter 2022 Update	2	2022	2	2022
SJICWG Meeting - CY 4th quarter 2022 Update	4	2022	4	2022
SJICWG Meeting - CY 4th quarter 2023 Update	4	2023	4	2023
SJICWG Meeting - CY 3rd quarter 2024 Update	3	2024	3	2024
SJICWG Meeting - CY 3rd quarter 2025 Update	3	2025	3	2025
SJICWG Meeting - CY 2nd quarter 2026 Update	2	2026	2	2026
SJICWG Meeting - CY 2nd quarter 2027 Update	2	2027	2	2027
Platform-Store Interface Control Document (PS ICD) Change Notices - M-Code Update	3	2022	3	2022
Platform-Store Interface Control Document (PS ICD) Change Notices - GeoZone Conops	2	2023	2	2023
Platform-Store Interface Control Document (PS ICD) Change Notices - Advanced Carriage Systems	2	2023	2	2023
Platform-Store Interface Control Document (PS ICD) Change Notices - M-Code Update	1	2024	1	2024
Certification Tools (CTs) Dev/ Update	1	2021	4	2027
System Integration Lab (SIL) Certification Tool (CT) software 3rd quarter 2022 updates	3	2022	3	2022
System Integration Lab (SIL) Certification Tool (CT) software 2nd quarter 2023 updates	2	2023	2	2023
System Integration Lab (SIL) Certification Tool (CT) software 4th quarter 2023 updates	4	2023	4	2023
System Integration Lab (SIL) Certification Tool (CT) software 2nd quarter 2024 updates	2	2024	2	2024

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604602F / *Armament/Ordnance Development*	**Project (Number/Name)** 655361 / *Stores-Aircraft Interface*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
System Integration Lab (SIL) Certification Tool (CT) software 1st quarter 2025 updates	1	2025	1	2025
System Integration Lab (SIL) Certification Tool (CT) software 4th quarter 2025 updates	4	2025	4	2025
Mission Planning CT software 3rd quarter 2022 updates	3	2022	3	2022
Mission Planning CT software 1st quarter 2024 updates	1	2024	1	2024
Mission Planning CT software 3rd quarter 2025 updates	3	2025	3	2025
UAI (Mission Planning) Common Component (CC)	1	2021	4	2027
CC software 3rd quarter 2022 updates	3	2022	3	2022
CC software 4th quarter 2023 updates	4	2023	4	2023
CC software 4th quarter 2024 updates	4	2024	4	2024
CC software 2nd quarter 2025 updates	2	2025	2	2025
Weapon Sustainment/Regression Efforts: JDAM, JASSM-ER, SDB I+II	1	2021	4	2027
A/C Sustainment/Regression Efforts: F-16 Blk 40/50, F-15E	1	2021	4	2027
Weapon Dev: SiAW, JSM, SPEAR3, LRASM, AARGM-ER, JAGM-F, Golden Horde, hypersonics, advanced carriage systems	1	2021	4	2027
A/C Dev: F-16 Foreign Military Sales, F-35, B-21, B-1, A-10, F-22, F-18, MQ-9, F-15EX, MQ-IC, AC-130J, B-52	1	2021	4	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604604F / *Submunitions*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	3.085	2.954	3.273	0.000	3.273	3.338	3.401	3.473	3.550	Continuing	Continuing
653166: *Joint Smart Munitions Test and Evaluation*	-	3.085	2.954	3.273	0.000	3.273	3.338	3.401	3.473	3.550	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project Chicken Little (PCL) continues providing superior rapid reaction signature exploitation capabilities for use on both the traditional and the asymmetrical battlefield. PCL delivers vital one-of-a-kind research, development, test, and evaluation (RDT&E) expertise directly to the warfighter, capability developer, and allied/coalition forces.

From its inception in 1985, PCL constantly advances the state-of-the-art for developmental smart munitions, seekers/sensors, and their platforms. PCL also focuses its capability against today's networked weapons, emerging weapon concepts, and helps develop innovative targeting technologies to be employed against a wide variety of vehicle targets, theater air defense units, and an extensive array of associated equipment.

Combat systems and support equipment exhibit physical characteristics (i.e. signatures) and present certain vulnerabilities, which can be exploited by various targeting technologies leading to the elimination or incapacitation of the threat through the application of force (e.g. smart munitions or directed energy) or application of intelligence, surveillance, reconnaissance (ISR) methods. PCL collects physical, functional, and signature attributes of real foreign threat systems and related equipment; this data feeds high-fidelity models used to predict detection, classification, vulnerability, and effectiveness performance for ISR sensor and weapon system design. PCL collects high resolution signature data using a variety of ground, air, and space-based sensors against both new and existing (obtained, sustained, and maintained to be signature representative) foreign targets; with and without the presence of camouflage, concealment, and deception materials; and operated using enemy tactics/Concept of Operations (CONOPS). The resulting highly reliable, realistic data directly support munitions/targeting development programs and helps mitigate overall acquisition risk. PCL serves as a major focal point for joint signature exploitation, collection, and dissemination within the DoD. PCL is a prime contributor in the time critical process to rapidly exploit, assess, and determine US and allied weapon/targeting performance against high value targets. Customers include: the major Defense and Service Intelligence Centers, all Services, the Joint Technical Coordinating Group (JTCG) who develop the Joint Munitions Effectiveness Manuals (JMEMs), Combatant Commands, AF Major Commands, US Air Force Weapons School curriculum support, and others. Current projects include, but are not limited to: target signature exploitation, target geometric modeling (for identifying vulnerabilities), improving air capabilities against protected structures (specifically hard and deeply buried targets), and the testing of multiple seekers, sensors, and targeting technologies in representative environments against Combatant Command/Major Command/Intelligence Community high value targets.

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 00605827F, 0605828F, 0605829F, 0605831F, 0605832F, 0605833F, 0605898F, 0606398F. In FY22 $0.00 was expended for civilian pay expenses in this program element, and in FY23 $0.00 is forecasted for civilian pay expenses in this program element.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604604F / *Submunitions*

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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	3.085	2.954	0.000	0.000	0.000
Current President's Budget	3.085	2.954	3.273	0.000	3.273
Total Adjustments	0.000	0.000	3.273	0.000	3.273
• 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	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	3.273	0.000	3.273

Change Summary Explanation

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Project Chicken Little (PCL)	3.085	2.954	3.273	0.000	3.273
Description: Provide the DoD community accurate multi-spectral signatures obtained from high-value, signature representative modern threat systems using advanced collection technologies. Exploitations typically occur CONUS; however, PCL is postured to support OCONUS collections as dictated by mission requirements. A critical underpinning of the System Exploitation major thrust area, Sensor Week, occurs every two years and provides a unique air and ground demonstration/validation of candidate Seeker/Sensor/Intelligence, Surveillance, and Reconnaissance (ISR) technologies. Plan and conduct captive carry flight tests and signature collection for seeker/sensor technology evaluations.					

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604604F / *Submunitions*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Develop, validate, and accredit improved models for target vulnerability and weapons effectiveness in support of Combatant Commands' (COCOMs) requirements. ***FY 2022 Plans:*** Exploit high value threat systems (typically 4 per year). Provide signature data from multiple threat systems in various environments using advanced and developmental seeker/sensor technologies. Conduct Sensor Week (SW), providing a singularly unique forum for joint service demonstration of developmental and operational seekers/sensors/ISR assets against a wide array of US, coalition, and foreign national ground targets. Exploit the signatures of ISR targets; conduct rapid reaction performance analysis & evaluations in support of COCOM/MAJCOM immediate/urgent warfighter needs; optimize current project methods to support ISR testing; capture and catalog multi-spectral signatures on asymmetric threat Unmanned Aerial Systems (UAS). Assist in obtaining relevant, high value, and emergent threat assets and/or decoys. Ensure the fleet foreign threat assets remain properly "signature representative" for systems development and testing. Develop, validate, and accredit improved computer models to determine target vulnerability and weapons effectiveness in support of warfighter requirements. ***FY 2023 Base Plans:*** Exploit high value threat systems (typically 4 per year). Provide signature data from multiple threat systems in various environments using advanced and developmental seeker/sensor technologies. Conduct Acoustic Week, providing a singularly unique forum for joint service demonstration of developmental and operational acoustic sensors against a wide array of US, coalition, and foreign national ground targets. Sensor platforms will include highly proliferated, asymmetric threat Unmanned Aerial Systems (UAS).					

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604604F / *Submunitions*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Exploit the signatures of ISR targets; conduct rapid reaction performance analysis & evaluations in support of COCOM/MAJCOM immediate/urgent warfighter needs; optimize current project methods to support ISR testing; capture and catalog multi-spectral signatures on asymmetric threat Unmanned Aerial Systems (UAS). No OCONUS requirements. Assist in obtaining relevant, high value, and emergent threat assets and/or decoys. Ensure the fleet foreign threat assets remain properly "signature representative" for systems development and testing. Develop, validate, and accredit improved computer models to determine target vulnerability and weapons effectiveness in support of warfighter requirements. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increased (a) due to inflation, and (b) because the FY2022 funding request had been reduced by $0.157 million to account for the availability of prior year execution balances.					
Accomplishments/Planned Programs Subtotals	3.085	2.954	3.273	0.000	3.273

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

Funds are executed organically in support of test and evaluation activities including studies, analyses, flight & ground tests, model building and simulation. Work is performed in-house by the 96th Test Wing.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604604F / *Submunitions*	**Project (Number/Name)** 653166 / *Joint Smart Munitions Test and Evaluation*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Maintain Test Asset Relevancy	PO	Various : Las Vegas, NV	-	0.800	Nov 2020	0.800	Nov 2021	0.800	Nov 2022	-		0.800	Continuing	Continuing	0.800
		Subtotal	-	0.800		0.800		0.800		-		0.800	Continuing	Continuing	N/A

Remarks

Fleet relevance addresses the acquisition of new and emerging threat vehicles, acquisition of high fidelity decoys, and sustainment of fleet signature quality.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Conduct Test and Analysis	MIPR	96th Test Wing : Eglin AFB, FL	-	2.230	Nov 2020	2.109	Nov 2021	2.411	Nov 2022	-		2.411	Continuing	Continuing	-
		Subtotal	-	2.230		2.109		2.411		-		2.411	Continuing	Continuing	N/A

Remarks

96th Test Wing (96 CTG, 46 TS) is the Program Office which conducts inhouse testing.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Services	MIPR	46TS/TGBB : Eglin, FL	-	0.055	Nov 2020	0.045	Nov 2021	0.062	Nov 2022	-		0.062	Continuing	Continuing	-
		Subtotal	-	0.055		0.045		0.062		-		0.062	Continuing	Continuing	N/A

Remarks

96th Test Wing (96 CTG, 46 TS) is the Program Office which conducts in house testing.

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	3.085		2.954		3.273		-		3.273	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604604F / *Submunitions*	Project (Number/Name) 653166 / *Joint Smart Munitions Test and Evaluation*	

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604604F / *Submunitions*	**Project (Number/Name)** 653166 / *Joint Smart Munitions Test and Evaluation*

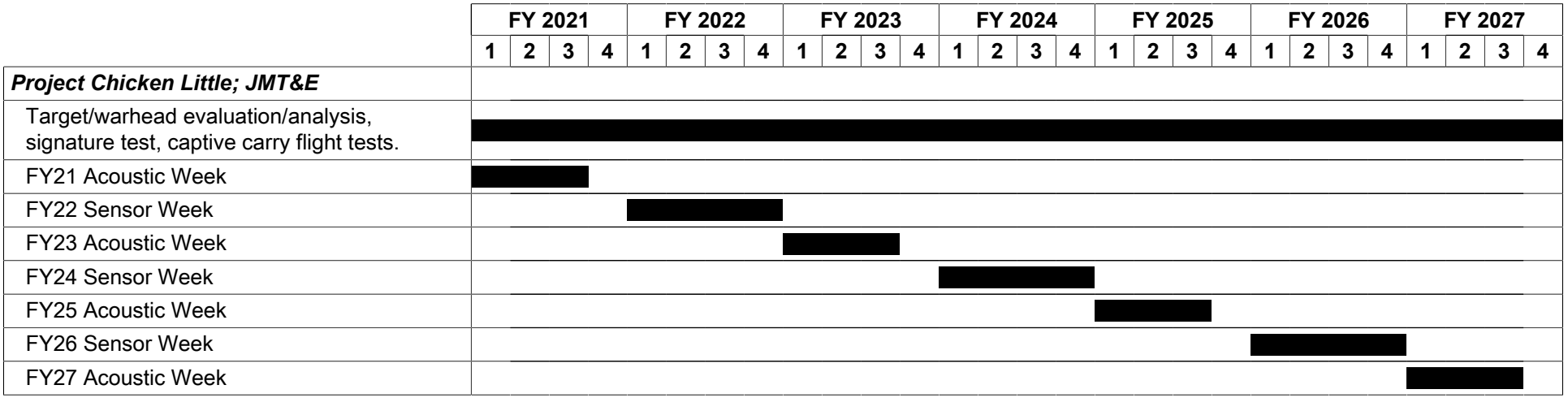

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604604F / *Submunitions*	**Project (Number/Name)** 653166 / *Joint Smart Munitions Test and Evaluation*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Project Chicken Little; JMT&E				
Target/warhead evaluation/analysis, signature test, captive carry flight tests.	1	2021	4	2027
FY21 Acoustic Week	1	2021	3	2021
FY22 Sensor Week	1	2022	4	2022
FY23 Acoustic Week	1	2023	3	2023
FY24 Sensor Week	1	2024	4	2024
FY25 Acoustic Week	1	2025	3	2025
FY26 Sensor Week	1	2026	4	2026
FY27 Acoustic Week	1	2027	3	2027

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604617F / *Agile Combat Support*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	18.398	27.938	14.252	0.000	14.252	23.187	23.545	24.284	24.826	Continuing	Continuing
652895: *Civil Engineering Readiness*	-	18.338	26.273	14.252	0.000	14.252	21.186	21.506	22.203	22.698	Continuing	Continuing
654910: *Aeromedical Readiness*	-	0.060	1.665	0.000	0.000	0.000	2.001	2.039	2.081	2.128	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program provides lighter, leaner, rapidly-deployable and technologically-advanced materiel, forces and capabilities to the warfighter. Current projects in this program include Civil Engineering Readiness (Project 652895) and Aeromedical Readiness (Project 654910). Civil Engineering Readiness projects enable airfield protection, and airfield damage recovery for sustainment, and increased resiliency of airfield operations anywhere in the world. Aeromedical Readiness projects provide aerospace medical systems and treatment equipment to improve casualty care and meet worldwide warfighter medical operational requirements.

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, and 0606398F. In FY21 $0.000 were expended, and in FY22 $0.000 is forecast 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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	18.980	16.603	0.000	0.000	0.000
Current President's Budget	18.398	27.938	14.252	0.000	14.252
Total Adjustments	-0.582	11.335	14.252	0.000	14.252
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-1.665			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	13.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.582	0.000			
• Other Adjustments	0.000	0.000	14.252	0.000	14.252

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604617F / *Agile Combat Support*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Project: 652895: *Civil Engineering Readiness*		
Congressional Add: *Carbon Materials*	0.000	3.000
Congressional Add: *Airfield Sustainment & Damage Recovery Technologies*	0.000	5.000
Congressional Add: *Modern Timber Products for Expeditionary Construction*	0.000	5.000
Congressional Add Subtotals for Project: 652895	0.000	13.000
Congressional Add Totals for all Projects	0.000	13.000

Change Summary Explanation

FY2022 changes includes +$13M of Congressional adds and -$1.665M Congressional Mark for Contract Award delays.

The FY2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604617F / *Agile Combat Support*	Project (Number/Name) 652895 / *Civil Engineering Readiness*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
652895: *Civil Engineering Readiness*	-	18.338	26.273	14.252	0.000	14.252	21.186	21.506	22.203	22.698	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Civil Engineering (CE) Readiness project develops Airbase Technologies (ABT), Airfield Damage Repair (ADR), Airfield Protection (AP), Energy & Utilities (E&U), and CE Materials (CEM) solutions for in-garrison, expeditionary, and contingency installations and airbases. This includes: technologies for airfield assessment, pavement repair and unexploded ordnance identification and mitigation to enable rapid recovery and regeneration of airfield operations; infrastructure design criteria, construction methods, hardened shelters, evaluation tools, materials, aviation firefighting, force protection, expeditionary energy, waste water recycling/treatment, CE materials applications and systems for improved resiliency and rapid recovery of airbase and airfield operations following an attack.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Airbase Technologies	3.022	2.723	3.352	-	3.352
Description: Technical support providing RDT&E capabilities for cross-cutting CE applications and processes for all CE functional areas. Provides replacements and repair of critical RDT&E lab equipment, test systems and instruments. Specialized RDT&E systems and software required to conduct CE RDT&E. ***FY 2022 Plans:*** Continue development and testing material technologies for indigenous soil-based cements and minimal basing processes including bio-based cementation for expeditionary ADR, test and evaluation of low resource manufacturing technologies for reduced life cycle costs, development and testing of additive manufacturing approaches for CE applications, development of functionalized materials for hardened infrastructure and force protection applications, evaluation, treatment, and mitigation technologies for aqueous film forming foams (AFFF) and development and testing of next generation fire-fighting and fire suppression agents, evaluation of expeditionary energy, utility, and infrastructure improvements, energy storage systems and incorporation of renewable energy systems with USAF assets. Replace/repair critical RDT&E lab equipment. Fund program management support, RDT&E IT systems and software required to conduct CE RDT&E. ***FY 2023 Base Plans:*** Continue development and testing material technologies to maximize indigenous resourcing for expeditionary civil engineering applications, processes for production of cementitious materials in theatre with increased sustainment and reduced life cycle costs, development and testing of deployable large-scale platforms, and variable material formulations for additive manufacturing of buildings and equipment for CE applications,					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604617F / *Agile Combat Support*	**Project (Number/Name)** 652895 / *Civil Engineering Readiness*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
development of functionalized materials for hardened infrastructure and force protection applications, mitigation technologies for AFFF and transition to next generation fire-fighting and fire suppression agents and systems, evaluation of energy, utility, and infrastructure improvements, energy storage systems and incorporation of alternative and renewable energy systems with USAF assets. Replace/repair critical RDT&E lab equipment. Fund program management support, RDT&E IT systems and software required to conduct CE RDT&E. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Planned increase for additive manufacturing					
Title: Airfield Damage Repair ***Description:*** This effort develops, tests, and certifies equipment, materials, and Tactics, Techniques, and Procedures (TTPs) for the rapid assessment and repair of airfield damage, which includes identification, mitigation or removal of unexploded ordnance and expedient repairs for fuel and utility systems. This effort will also accelerate the transition of proven technologies in expedient and sustained protection of critical infrastructure, including operating surfaces, shelters, fuel storage and distribution systems, and command and control (C2) systems. Further, this effort focuses on the resiliency of airbase infrastructure as well as the timely repair and regeneration of airfield operations within established time limits in order to gain and maintain air superiority. ***FY 2022 Plans:*** Mature and transition the rapid assessment, mitigation, and repair tool and material solutions for airfield damage recovery through research, development, testing, and evaluation. Rapid assessment includes spiral development and integration of small unmanned aircraft systems (SUAS), mobile towers, and handheld platforms to utilize various sensors, to provide data for automated damage detection software solutions to significantly decrease damage assessment time and improve automated detection of unexploded ordnance (UXO). In order to meet improved sensor requirements for enhanced detection and classification of damage/ debris, new platforms will be identified to meet current and future needs. Mitigation includes development, testing and evaluation of systems to remotely remove and neutralize UXO through a family of Rapid Explosive Hazard Mitigation (REHM) components. This family of systems will include manned and unmanned systems with improved blast resistance capability to fit on both new and existing heavy equipment, physical destruction of UXO through stand-off methods, and Subsurface Location, Access, and Mitigation (SLAM) of buried UXO. Repair of damage focuses on development, testing, and transition of materials and equipment sets for rapid recovery of enemy induced battle damaged runways. New materials will have minimal dependence on shipping and logistics through use of indigenous materials, with new techniques and procedures to place locally sourced materials to provide equal or greater strength to current ADR methodologies. New systems will be developed	9.397	7.000	7.000	-	7.000

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604617F / *Agile Combat Support*	**Project (Number/Name)** 652895 / *Civil Engineering Readiness*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
and tested to provide similar or greater repair speeds with smaller logistic requirement, and current equipment test and evaluation will focus heavily on testing and operation in extreme weather conditions, along with methods for repair that will support current Agile Combat Employment (ACE) operations and strategies. ***FY 2023 Base Plans:*** Mature and transition the rapid assessment, mitigation, and repair tool and material solutions for airfield damage recovery through research, development, testing, and evaluation. Rapid assessment includes spiral development and integration of small unmanned aircraft systems (SUAS), mobile towers, and handheld platforms to utilize various sensors, to provide data for automated damage detection software solutions to significantly decrease damage assessment time and improve automated detection of unexploded ordnance (UXO). Mitigation includes development, testing and evaluation of systems to remotely remove and neutralize UXO through a family of Rapid Explosive Hazard Mitigation (REHM) components. This family of systems will include manned and unmanned systems with improved blast resistance capability to fit on both new and existing systems. Repair of damage focuses on development, testing, and transition of materials and equipment sets for rapid recovery of enemy induced battle damaged runways. New materials will have minimal dependence on shipping and logistics, with new techniques and procedures to place locally sourced materials to provide equal or greater strength to current ADR equipment. New systems will be developed and tested to provide similar or greater repair speeds with smaller logistic requirement, and current equipment test and evaluation will focus heavily on testing and operation in extreme weather conditions. New procedures and equipment will be identified to fully replace/rejuvenate pavement runways using Full Depth Reclamation process. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Planned increase for Rapid Damage Recovery supporting ACE					
Title: Airfield Protection ***Description:*** Research, develop and transition technologies for hardening and protecting airfield infrastructure from munitions attack, unexploded ordnance and aircraft, equipment and infrastructure fires. Included within this effort are structural solutions, expeditionary and expedient hardening and protection solutions, explosive ordnance disposal technologies and aviation firefighting technologies. The technologies developed from this effort provide improved resiliency and rapid restoration of airbase and airfield operations following an attack. ***FY 2022 Plans:*** Upgrade/modernize existing personnel protective bunkers and Air Force infrastructure hardening standards to meet current threat(s). Continue RDT&E of new concepts for protection materials for lighter, less expensive solutions for infrastructure hardening. Test and evaluate technologies against penetrating munitions including	3.000	2.800	3.000	-	3.000

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604617F / *Agile Combat Support*	**Project (Number/Name)** 652895 / *Civil Engineering Readiness*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
cruise missile hardening and improve expedient sheltering to address advanced threats through concepts such as Hasty Aircraft Inflatable Large Shelters (HAILS). Continue testing of selective hardening systems for infrastructure. Continue testing and evaluation of unconventional countermeasures technology for transition. Continue research and development of aviation firefighting technologies for treatment and replacement of the perfluorinated aqueous film forming foams (AFFF),clean firefighting agents - Halon replacement and aviation firefighting equipment. Continue RDT&E of EOD technologies for neutralization UXO threats for transition into service. ***FY 2023 Base Plans:*** Research and prototype Camouflage Concealment and Deception (CCD) concepts for critical equipment and small aircraft. Test and evaluate additively manufactured concrete structures for blast and ballistic performance and update design guidance accordingly. Update personnel bunker designs to reduce the likelihood of traumatic brain injuries (TBI) from emerging threats. Continue development of building wall and roof sections to reduce construction cost and increase survivability against guided munitions. Improve equipment protection systems to better align with agile combat objectives. Evaluation of Per- and polyfluoroalkyl substances (PFAS)-free foams, mitigation technologies for Aqueous film forming foam (AFFF), and new/emergent technologies for fire protection and training. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Planned increase to support ACE protection needs					
Title: Energy & Utilities ***Description:*** Research, develop and transition technologies for energy and utilities resiliency for BEAR base and airbase infrastructure. The focus of this effort is for energy and utilities technologies that provide increased efficiency and decreased logistic costs for expeditionary and in-garrison applications. This includes:expeditionary shelters, environmental conditioning systems, water and waste stream processing, power production and power management systems. ***FY 2022 Plans:*** Complete development of the METER site at Tyndall AFB. Continue bench and lab scale testing of new energy and utilities technologies at the METER site prior to scaling up to full scale test and evaluation at the BTEIL site. Continue test and evaluation of expeditionary energy storage and shelter technologies that incorporate resiliency and sustainability capabilities for USAF expeditionary assets. Conduct field demonstration of innovative expeditionary water and waste disposal systems in an operational environment prior to fielding such as in Arctic environments, in order to support current Arctic strategy needs. Support test and evaluation	0.969	0.750	0.900	-	0.900

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604617F / *Agile Combat Support*	**Project (Number/Name)** 652895 / *Civil Engineering Readiness*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
of commercial technologies/systems that includes: expeditionary shelters, environmental conditioning systems, hybrid renewable energy systems, energy storage, power generation and management system, water and waste stream processing system. These systems will provide warfighters with improved energy resiliency and efficiency while and reducing logistics for expeditionary and fixed base operations. ***FY 2023 Base Plans:*** Continue bench and lab scale testing of new energy and utilities technologies at the METER site prior to scaling up to full scale test and evaluation at the BTEIL site. Continue field testing and evaluation of expeditionary energy storage and shelter technologies that incorporate energy resiliency and sustainability capabilities for USAF expeditionary assets. Conduct field demonstration of innovative expeditionary water and waste processing systems in an operational environment prior to fielding. Continue supporting test and evaluation of commercial technologies/systems that includes: expeditionary shelters, environmental conditioning systems, hybrid renewable energy systems, energy storage, power generation and management system, water and waste stream processing system. Successful development of these systems will provide capabilities for warfighters that improve energy resiliency and energy efficiency while reducing logistics needs for expeditionary and fixed base applications. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** No change					
Title: Expeditionary Airfield Damage Repair (EADR) JCTD ***Description:*** The purpose of the EADR JCTD is to develop and transition the capability to rapidly and repeatedly repair damaged airfield surfaces operating under the dynamic basing concept of operations (CONOP). The goal is to develop and transition technologies that minimize airfield downtime and maximize combat sortie generation. The JCTD will execute a spiral development-oriented program that will transition mature technologies throughout the life of the program. ***FY 2022 Plans:*** None project complete in FY21 ***FY 2023 Base Plans:*** None project complete in FY21 ***FY 2023 OCO Plans:*** None ***FY 2022 to FY 2023 Increase/Decrease Statement:***	1.950	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604617F / *Agile Combat Support*	**Project (Number/Name)** 652895 / *Civil Engineering Readiness*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
None project complete in FY21					
Accomplishments/Planned Programs Subtotals	18.338	13.273	14.252	0.000	14.252

	FY 2021	FY 2022
Congressional Add: Carbon Materials ***FY 2021 Accomplishments:*** None, new start CII ***FY 2022 Plans:*** Conduct research into Carbon Materials for Civil Engineer applications.	0.000	3.000
Congressional Add: Airfield Sustainment & Damage Recovery Technologies ***FY 2021 Accomplishments:*** None, new start CII ***FY 2022 Plans:*** Conduct research into Airfield Sustainment and Damage Recovery Technologies for Civil Engineer applications. Optimize technologies that will enable asphalt to set at cooler temperatures which will reduce energy consumption at forward base operations.	0.000	5.000
Congressional Add: Modern Timber Products for Expeditionary Construction ***FY 2021 Accomplishments:*** None, new start CII ***FY 2022 Plans:*** Conduct research into Modern Timber Products for Expeditionary Construction and Civil Engineer applications.	0.000	5.000
Congressional Adds Subtotals	0.000	13.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• OPAF 04 Line Item 845100A: *Contingency Operations - Engineering and EOD Equipment*	0.000	61.464	162.523	-	162.523	173.669	167.773	171.299	-	Continuing	Continuing

Remarks

Procurement funding for Expedient Small Asset Protection (ESAP) systems, Rapid Airfield Damage Assessment System (RADAS) and Recovery of Airbases Denied by Ordnance (RADBO) in PE 0208028F.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604617F / *Agile Combat Support*	**Project (Number/Name)** 652895 / *Civil Engineering Readiness*

D. Acquisition Strategy

This Civil Engineering (CE) Readiness project develops and evaluates technologies for in-garrison, expeditionary, and contingency installations & airbases. This encompasses a wide range of solutions and COTS equipment that are fielded to support the CE mission of the USAF. The acquisition strategy utilizes AFCEC RDT&E contracts as well as AFLCMC, GSA, other DoD and US Government laboratories/engineering centers, contracts and other transaction agreements whenever practical for the specific technology development effort.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604617F / *Agile Combat Support*	**Project (Number/Name)** 652895 / *Civil Engineering Readiness*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Airbase Technologies	Various	AFCEC : Tyndall AFB, FL	-	2.156		1.503	Nov 2021	2.324		-		2.324	Continuing	Continuing	-
Airfield Damage Repair (ADR) ERDC	MIPR	USERDC : Vicksburg, MS	-	0.625	Jan 2021	1.200	Jan 2022	1.000		-		1.000	Continuing	Continuing	-
Airfield Damage Repair (ADR)	Various	AFCEC : Tyndall AFB, FL	-	1.875		1.200		1.200		-		1.200	Continuing	Continuing	-
Expeditionary Airfield Damage Repair eADR JCTD	Various	AFCEC : Tyndall AFB, FL	-	2.384		-		0.000		-		0.000	0.000	2.384	-
Airfield Pavements & Technologies	C/CPFF	ARA Inc : Panama City, FL	-	3.905	Oct 2020	1.600	Nov 2021	0.950		-		0.950	Continuing	Continuing	-
EOD & Robotics Technologies	C/CPFF	Torch Technologies : Huntsville, AL	-	0.548	Oct 2020	0.314	Dec 2021	0.500		-		0.500	Continuing	Continuing	-
RADAS Integration	C/CPAF	Torch Technologies : Huntsville, AL	-	2.300		2.700	Dec 2021	3.300		-		3.300	Continuing	Continuing	-
Airfield Protection (AP) Infrastructure Hardening	C/CPFF	Battelle : Panama City, FL	-	1.997	Dec 2020	1.800	Nov 2021	2.043		-		2.043	Continuing	Continuing	-
Airfield Protection (AP) Aviation Firefighting Technologies	C/CPFF	Battelle : Panama City, FL	-	0.000	Dec 2020	0.900	Nov 2021	0.750		-		0.750	Continuing	Continuing	-
Energy & Utilities RDT&E	C/CPFF	Battelle : Panama City, FL	-	0.970	Oct 2020	0.750	Nov 2021	0.950		-		0.950	Continuing	Continuing	-
Airfield sustainment and damage recovery technologies	Various	TBD : TBD	-	0.000		5.000		0.000		-		0.000	Continuing	Continuing	-
Carbon materials	Various	TBD : TBD	-	0.000		3.000		0.000		-		0.000	Continuing	Continuing	-
Modern timber products for expeditionary construction	Various	TBD : TBD	-	0.000		5.000		0.000		-		0.000	Continuing	Continuing	-
		Subtotal	-	16.760		24.967		13.017		-		13.017	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604617F / *Agile Combat Support*	Project (Number/Name) 652895 / *Civil Engineering Readiness*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Administration (PMA)	Various	AFCEC : Tyndall AFB, FL	-	0.639	Apr 2021	0.400	Apr 2022	0.300		-		0.300	Continuing	Continuing	-
		Subtotal	-	0.639		0.400		0.300		-		0.300	Continuing	Continuing	N/A

Remarks

PMA includes travel and supplies to support CE Readiness RDT&E activities.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
A&AS Program Support RDT&E	C/FFP	Multiple : FL	-	0.939	Oct 2020	0.906	Oct 2021	0.935	Oct 2022	-		0.935	Continuing	Continuing	-
		Subtotal	-	0.939		0.906		0.935		-		0.935	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	18.338		26.273		14.252		-		14.252	Continuing	Continuing	N/A

Remarks

Current delta due to most recent updates to ABIDES that is not reflected yet in IDECS.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604617F / *Agile Combat Support*	**Project (Number/Name)** 652895 / *Civil Engineering Readiness*

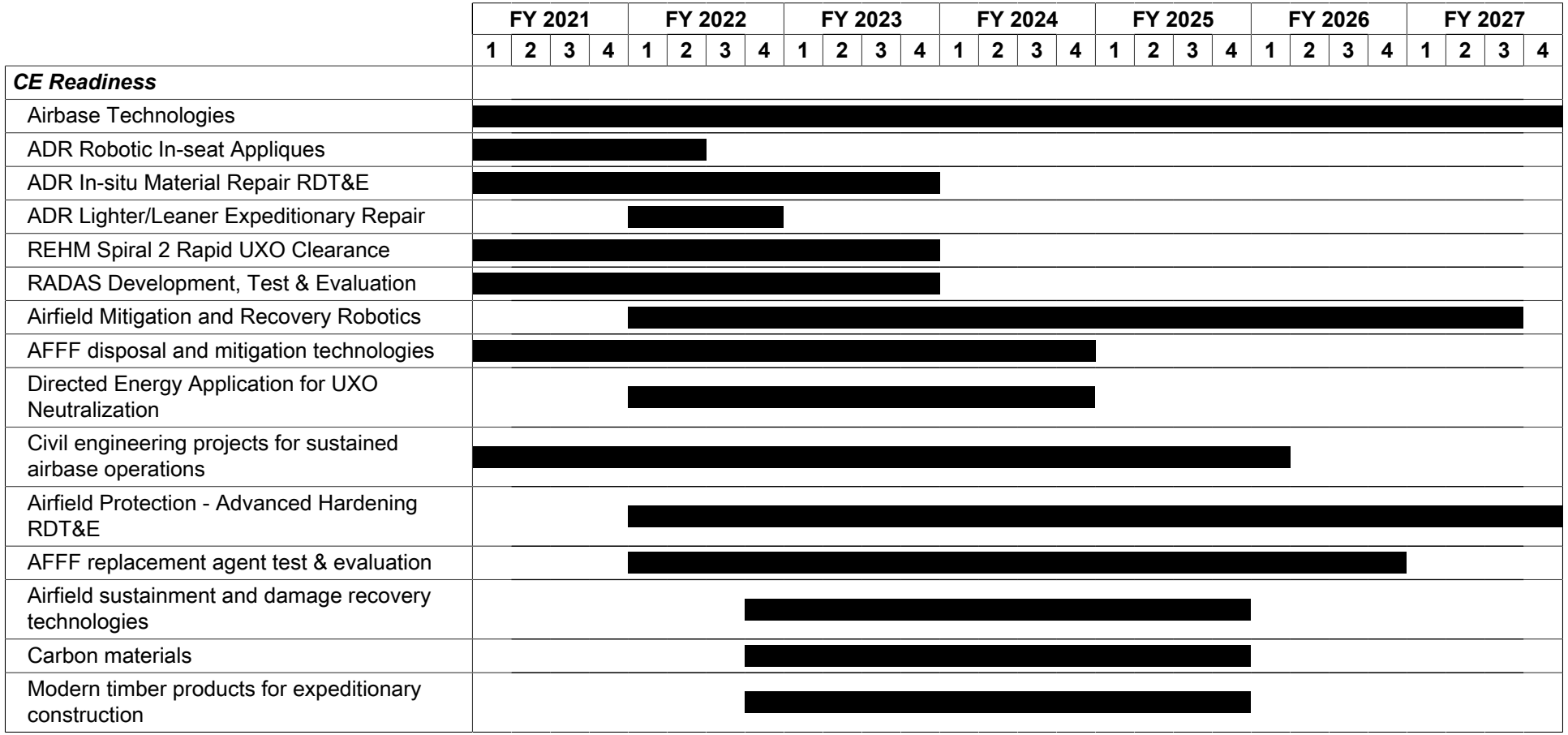

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604617F / *Agile Combat Support*	**Project (Number/Name)** 652895 / *Civil Engineering Readiness*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
CE Readiness				
Airbase Technologies	1	2021	4	2027
ADR Robotic In-seat Appliques	1	2021	2	2022
ADR In-situ Material Repair RDT&E	1	2021	4	2023
ADR Lighter/Leaner Expeditionary Repair	1	2022	4	2022
REHM Spiral 2 Rapid UXO Clearance	1	2021	4	2023
RADAS Development, Test & Evaluation	1	2021	4	2023
Airfield Mitigation and Recovery Robotics	1	2022	3	2027
AFFF disposal and mitigation technologies	1	2021	4	2024
Directed Energy Application for UXO Neutralization	1	2022	4	2024
Civil engineering projects for sustained airbase operations	1	2021	1	2026
Airfield Protection - Advanced Hardening RDT&E	1	2022	4	2027
AFFF replacement agent test & evaluation	1	2022	4	2026
Airfield sustainment and damage recovery technologies	4	2022	4	2025
Carbon materials	4	2022	4	2025
Modern timber products for expeditionary construction	4	2022	4	2025

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604617F / *Agile Combat Support*	Project (Number/Name) 654910 / *Aeromedical Readiness*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
654910: *Aeromedical Readiness*	-	0.060	1.665	0.000	0.000	0.000	2.001	2.039	2.081	2.128	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

FY21 funding: Due to a database error, FY21 Congressional Mark was applied to BPAC 652895 instead of BPAC 654910 Aeromed. Correct funding for Aeromed BPAC 654910 should be $0.060M

A. Mission Description and Budget Item Justification

Aeromedical Readiness provides key aeromedical devices, life-saving capabilities and quality of life technologies and equipment. This program enables the critical care of combat casualties by further developing and optimizing existing technologies for ground Expeditionary Medical Systems (EMEDS) and aeromedical evacuation systems. EMEDS and aeromedical evacuation systems provide the urgent care needed to treat deployed injured warfighters and return them to duty while in country, and to treat combat casualties that need to be safely transported to a stateside hospital for follow on treatment. The program also supports critical capabilities development in the multi-disciplinary areas for light-weight, durable, and rapidly deployable medical equipment to ensure the Air Force is poised to meet future medical readiness and operational requirements, to include but not limited to Spinal Immobilization Transport Device (SIT-D), Pathogen Detection Capability, Automated Vision Testing, Whole Blood Transport and other FDA approved medical treatment devices. This program supports projects ranging from research efforts to optimize human physiologic and cognitive performance for Air Combat Command, to development of patient isolation and transportation devices for Air Mobility Command that enable aeromedical evacuation of patients suffering with highly infectious diseases.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Aeromedical Equipment Testing/Studies/Minor Development	0.060	1.665	0.000	0.000	0.000
Description: Aeromedical supports Defense Health Program, Joint Services and MAJCOM medical modernization. The Air Force Medical Readiness Agency (AFMRA) Surgeon General Requirement Oversight Council (SGROC) Governance process manages medical capability gaps, research and development, funding prioritization and decisional boards. Aeromedical procures and qualifies commercial-off-the-shelf (COTS) or near COTS medical and aeromedical products and/or performs minor development, studies and management efforts, under Aeromedical Readiness. Aeromedical Program efforts evaluate integrating technologies or prototype systems in a realistic operating environment, expedite technology transition from the laboratory to operational use, emphasis on proving maturity prior to integration and viable decision ready materiel solutions.					
FY 2022 Plans: Contract Studies to develop Medical requirements.					
FY 2023 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604617F / *Agile Combat Support*	**Project (Number/Name)** 654910 / *Aeromedical Readiness*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Contract Studies to develop Medical requirements. ***FY 2023 OCO Plans:*** NA ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease to support other USAF priorities					
Accomplishments/Planned Programs Subtotals	0.060	1.665	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Multi-Modal Threat Detection and Mitigation Congressional Add improperly aligned to BPAC 654910. Funding is being executed out of BPAC 652895.

FY21 Aeromed funding incorrect due to database system error. BPAC 654910 should equal $0.060M

D. Acquisition Strategy

Programs consider a streamlined acquisition approach. Whenever practical, commercial items are tested and evaluated as candidates for providing solutions to user needs. This normally involves contractor characterization, verification, and qualification testing to ensure Food and Drug Administration (FDA) approved, commercial off-the-shelf equipment is properly evaluated to identify any capability gaps that may require minor modifications for military use. However, acquisition strategies may also be carried out for traditional Engineering and Manufacturing Development (EMD). Funds may be used to address associated emerging Aeromedical Readiness requirements and for program management activities.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604617F / *Agile Combat Support*	Project (Number/Name) 654910 / *Aeromedical Readiness*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Aeromedical Equipment R&D (Production Representative Units, Testing, Manufacturing Maturation, Food and Drug Administration Clearance)	C/FFP	AFLCMC : Wright-Patterson AFB, OH	-	0.000	Sep 2021	1.665	Sep 2022	0.000	May 2023	-		0.000	Continuing	Continuing	-
		Subtotal	-	0.000		1.665		0.000		-		0.000	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Administration	C/CPFF	AFLCMC : Wright-Patterson AFB, OH	-	0.060	Oct 2020	-		0.000		-		0.000	Continuing	Continuing	-
		Subtotal	-	0.060		-		0.000		-		0.000	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.060		1.665		0.000		-		0.000	Continuing	Continuing	N/A

Remarks

Product Development: Technology Transfer/Aeromedical Equipment is TBD due to contract source selections.

Multi-Modal Threat Detection and Mitigation Congressional Add improperly aligned to BPAC 654910. Funding is being executed out of BPAC 652895.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604617F / *Agile Combat Support*	**Project (Number/Name)** 654910 / *Aeromedical Readiness*

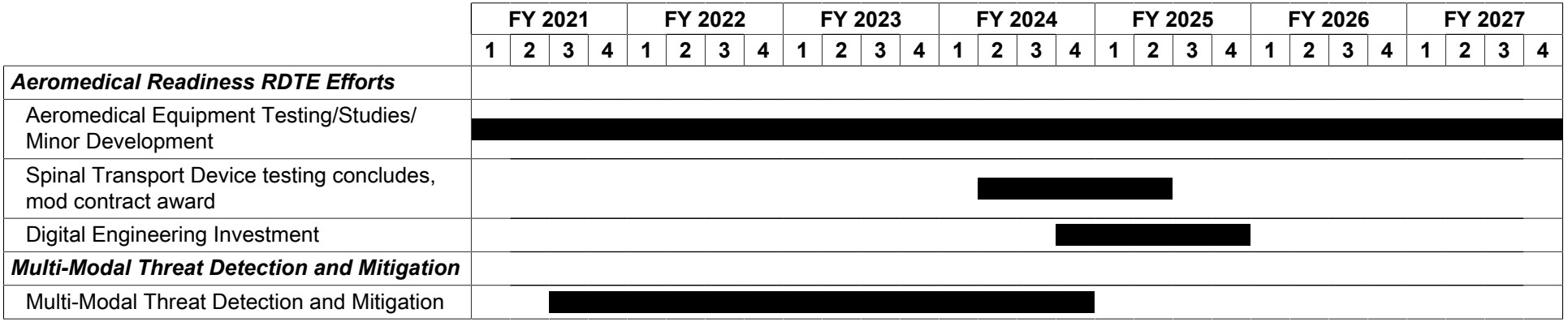

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604617F / *Agile Combat Support*	**Project (Number/Name)** 654910 / *Aeromedical Readiness*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Aeromedical Readiness RDTE Efforts				
Aeromedical Equipment Testing/Studies/Minor Development	1	2021	4	2027
Spinal Transport Device testing concludes, mod contract award	2	2024	2	2025
Digital Engineering Investment	4	2024	4	2025
Multi-Modal Threat Detection and Mitigation				
Multi-Modal Threat Detection and Mitigation	3	2021	4	2024

Note

Multi-Modal Threat Detection and Mitigation Congressional Add improperly aligned to BPAC 654910. Funding is being executed out of BPAC 652895.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604618F / *Joint Direct Attack Munition*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	0.000	6.555	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.555
653891: *JDAM M-Code Integration*	0.000	6.555	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.555
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2021 PE 0604618F, JDAM M-Code Integration was completed.

A. Mission Description and Budget Item Justification

Military Code (M-Code) receivers with Enhanced Anti-Jam (EAJ) will be developed and integrated in order to provide advanced Positioning, Navigation, and Timing (PNT) capabilities to allow operations in anti-access/area denial (A2/AD) environments. M-Code and EAJ also provide increased accuracy, better signal acquisition, and advanced security.

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 0605831F. In FY21 $0M was expended for civilian pay expenses in this program element, and in FY22 $0M 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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	6.806	0.000	0.000	0.000	0.000
Current President's Budget	6.555	0.000	0.000	0.000	0.000
Total Adjustments	-0.251	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	-0.006	0.000			
• SBIR/STTR Transfer	-0.245	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604618F / *Joint Direct Attack Munition*

Change Summary Explanation

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: M-Code/Enhanced Anti-Jam (EAJ)	6.555	0.000	0.000
Description: Develop and integrate M-Code receivers with EAJ to provide advanced Positioning, Navigation, and Timing (PNT) capabilities, providing the capability to operate in adversarial anti-access/area denial (A2/AD) environments. M-Code receivers with EAJ also provides increased accuracy, better signal acquisition, and advanced security. ***FY 2022 Plans:*** N/A ***FY 2023 Plans:*** N/A			
Accomplishments/Planned Programs Subtotals	6.555	0.000	0.000

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• RDTE 04 0604201F: *PNT Resiliency*	-	39.742	12.010	-	12.010	-	-	-	-	0.000	51.752

Remarks

E. Acquisition Strategy

M-Code/EAJ effort uses a Family of Systems approach where the three prime weapons contractors develop receivers capable of operating in any of their AF weapons. The receivers are based on a common, internally-developed Interface Requirements Specification, Technical Requirements Document, and threat scenario. This approach uses a combination of contract types based on acquisition phase (Technology Maturation and Risk Reduction, Development, Production) and risk. The Weapons System Program Offices share a common development program element to allow flexibility in funding and planning, switching to individual PEs for receiver integration, operational testing, and production. The M-Code/EAJ Weapons Receiver Development effort leverages technology currently under development by the Global Positioning System (GPS)-D Military GPS User Equipment (MGUE) program and will provide the warfighter with unmatched capability to operate in future A2/AD environments.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604618F / *Joint Direct Attack Munition*	Project (Number/Name) 653891 / *JDAM M-Code Integration*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
M-Code	SS/TBD	Boeing : St Louis, MO	0.000	6.555	Mar 2021	-		-		-		-	0.000	6.555	7.926
		Subtotal	0.000	6.555		-		-		-		-	0.000	6.555	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	6.555		-		-		-		-	0.000	6.555	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604618F / *Joint Direct Attack Munition*	**Project (Number/Name)** 653891 / *JDAM M-Code Integration*

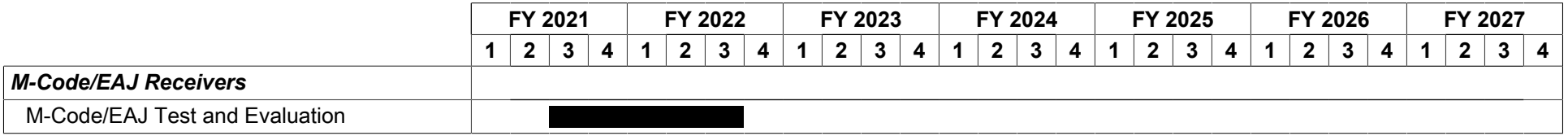

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604618F / *Joint Direct Attack Munition*	**Project (Number/Name)** 653891 / *JDAM M-Code Integration*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
M-Code/EAJ Receivers				
M-Code/EAJ Test and Evaluation	3	2021	3	2022

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604706F / *Life Support Systems*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	27.748	25.437	47.442	0.000	47.442	27.975	25.308	26.087	29.788	Continuing	Continuing
65412A: *Life Support Systems*	-	27.748	25.437	47.442	0.000	47.442	27.975	25.308	26.087	29.788	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program saves Airmen's lives and improves aircrew performance through better aircrew flight equipment and airman combat systems. Air Force acquisition teams lead the upgrade and fielding of new equipment and systems by assessing deficiencies in existing equipment, identifying and assessing existing products or developing new technology, and conducting required Safe-to-Fly tests, certifications, and studies. Program efforts include, but are not limited to, the following projects: directed energy protective equipment; flight helmets and visors; oxygen breathing systems for aircrew; radios and locator beacons; support equipment; nuclear flash blindness protection; night vision devices; noise reduction devices; all types of flight suits and ensembles to protect aircrew against environmental threats; anti-gravity (anti-G) suits; flame resistant, retardant and blast/ballistic protective gear; aircraft seating; impact protection equipment; flotation devices; parachutes; ejection systems; post-ejection survival systems; physiological monitoring devices and other aircrew, life support, and ground crew systems required by the warfighter.

The total cost of the Next Gen Fixed Wing Helmet (NGFWH) Middle Tier of Acquisition effort is $21.9M, including RDT&E and procurement of prototype units. The NGFWH 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 element element 0605827F, 0605828F, 0605829F, 0605831F, 0605832F, 0605833F, 0605898F, and 0606398F. In FY21 0.859M was expended for civilian pay expenses in this program element, and in FY22 1.1M is forecast for civilian pay expenses in this 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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604706F / *Life Support Systems*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	28.608	25.437	0.000	0.000	0.000
Current President's Budget	27.748	25.437	47.442	0.000	47.442
Total Adjustments	-0.860	0.000	47.442	0.000	47.442
• 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	-0.860	0.000			
• Other Adjustments	0.000	0.000	47.442	0.000	47.442

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Project: 65412A: *Life Support Systems*		
Congressional Add: *Physiological Monitoring*	5.000	0.000
Congressional Add Subtotals for Project: 65412A	5.000	0.000
Congressional Add Totals for all Projects	5.000	0.000

Change Summary Explanation

The FY2022 President's Budget submittal did not reflect FY2023 through FY2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Aircrew Performance Studies/Technology Projects and Minor Development Efforts	8.818	10.710	15.505	0.000	15.505
Description: Air Force Life Cycle Management Center's Aircrew Performance Branch is the single USAF focal point for Aircrew Flight Equipment (AFE) Safe-to-Fly (STF) testing certification, addressing Safety Investigation Board (SIB) recommendations, along with studies and analysis. In addition, funding is for efforts that are responses to real-time capability gaps identified by the warfighter which may be satisfied by testing and qualifying commercial-off-the-shelf (COTS) products and/or performing minor development efforts that require less than $10M per year related to aircrew flight equipment and life support equipment. Previous successful efforts may evolve into enduring capabilities as other users and MAJCOMs seek to incorporate these STF					

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604706F / *Life Support Systems*	

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
assets into their inventory. Integrated Aircrew Ensemble (IAE), Aircrew Body Armor (ABA), Aircrew Laser Eye Protection - Technical Insertion (ALEP-TI), Next Generation Fixed Wing Helmet (NGFWH), BA-X Low Profile Parachute (LPP) and Nuclear Flash Blindness Goggles (NFBG) are currently the active programs within Life Support Systems (LSS). Funds may be used to address associated emerging aircrew, ground crew, and egress requirements, and for program management activities. ***FY 2022 Plans:*** Perform STF testing and certification of COTS products. Address SIB recommendations. Continue the development and test efforts for aircrew laser eye protection - technical insertion (ALEP-TI), radio upgrades, next generation fixed wing helmet, next generation nuclear flash blindness technology, and improvement of parachute/flotation devices. ***FY 2023 Base Plans:*** Continue to perform STF testing and certification of COTS products. Address SIB recommendations. Continue the development and test efforts for aircrew laser eye protection - technical insertion (ALEP-TI), radio upgrades, next generation fixed wing helmet, next generation nuclear flash blindness technology, and improvement of parachute/flotation devices. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The ramping up of the Nuclear Flash Blindness Goggles program is driving the increase in budget authority					
Title: Next Generation Ejection Seat ***Description:*** The new ejection seat escape system safely accommodates greater variation in aircrew minimum and maximum weights at minimum aircrew sitting height of 31 inches, including 59% of the female pilot population, and the use of Helmet Mounted Displays. It reduces the risk of injuries to the arms and legs (especially due to limb flail), neck, and spinal column throughout ejection phases. ***FY 2022 Plans:*** Continue contract effort awarded as part of Congressional add for initial F-15 platform system qualification, test assets, and training materials. The functional baseline system qualification will validate a common ejection system design for integration with the F-15, F-16, F-22, B-1, and A-10 aircraft platforms. ***FY 2023 Base Plans:***	8.724	10.000	24.591	0.000	24.591

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604706F / *Life Support Systems*	

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Continue contract effort awarded for aircraft integration qualification testing for follow-on NGES variants. Initial platform first article test, test readiness review, and delta qualification sled tests completion. F-16 is scheduled to begin in FY23 to support continuous ejection system qualification. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase due to additional anthropometric body range studies, MASS sequencer obsolescence, early operational assessment of maintainability, and DCAA rate increases.					
Title: Female Airmen Equipment	5.206	4.727	7.346	0.000	7.346
Description: Female Fitment within Human Systems Division (HSD) of the Air Force Life Cycle Management Center develops and sustains organizational clothing and individual equipment (OCIE) & personal protective equipment (PPE) for female Airmen to enhance mission performance while improving safety and survival. HSD aligned Female Fitment as a top priority, matching CSAF vision, and ensures that the fullest extent of the AF female anthropometric range is incorporated into all of its programs. Outreach with other AF organizations and sister services ensures that requirements are collected to vector current and future programs. Anthropometric data collection ensures that these programs produce the OCIE and PPE that will allow women to perform their best in the missions they are assigned. OCIE and PPE for female aircrew includes, but is not limited to, the development and refinement of flight suits, bladder relief systems, helmets, ejection seats, G-suits, aircrew body armor, oxygen masks, and feedback mechanisms. ***FY 2022 Plans:*** Continue testing and development of female flight equipment: Items anticipated to be worked include the AF GearFit App, in-flight bladder relief systems, aircrew harness, oxygen masks, and anthropometric studies ***FY 2023 Base Plans:*** Continue testing and development of female flight equipment: Items anticipated to be worked include, but not limited to, the AF GearFit, aircrew harness, anthropometric studies ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:***					

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604706F / *Life Support Systems*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
The decrease from FY22 tied to program transition from initial AF ramp to focus on female fitment gap.					
Accomplishments/Planned Programs Subtotals	22.748	25.437	47.442	0.000	47.442

	FY 2021	FY 2022
Congressional Add: Physiological Monitoring	5.000	0.000
FY 2021 Accomplishments: The Physiological Monitoring Congressional Add acquires test assets required to evaluate SPYDR system and perform Developmental Test. ***FY 2022 Plans:*** N/A		
Congressional Adds Subtotals	5.000	0.000

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• OPAF 04 Line Item 842990: *Items Less Than $5 Million (Safety and Rescue Equipment)*	24.407	62.195	65.744	-	65.744	72.740	70.459	57.247	65.590	Continuing	Continuing

Remarks

E. Acquisition Strategy

The majority of efforts funded in this project employ a streamlined acquisition approach. Whenever practical, Government-Off-The-Shelf/Commercial-Off-The-Shelf (GOTS/COTS) items are tested and evaluated as candidates for solutions to user needs. This normally involves characterization, verification, and qualification testing to ensure GOTS/COTS equipment is properly certified and adapted for military purposes. However, acquisition strategies may be carried out at the project level for traditional Engineering and Manufacturing Development (EMD), e.g., Integrated Aircrew Ensemble (IAE) and Aircrew Laser Eye Protection - Technical Insertion (ALEP-TI). Funds may be used to address associated emerging aircrew/ground crew/egress requirements and for program management activities.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604706F / *Life Support Systems*	Project (Number/Name) 65412A / *Life Support Systems*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Congressional Add for Physiological Monitoring	MIPR	DIU : PICATINNY ARSENAL, NJ	-	4.849	Jul 2021	-		-		-		-	Continuing	Continuing	-
Aircrew Performance Studies/Technology Projects/Minor Development Efforts	Various	Multiple Contractors : TBD	-	5.918	Jan 2021	9.430	Jan 2022	10.505		-		10.505	Continuing	Continuing	-
Integrated Aircrew Ensemble (IAE)	C/CPFF	Tiax : Lexington, MA	-	0.081	Jan 2021	-		-		-		-	Continuing	Continuing	-
Next Generation Ejection Seat (NGES)	SS/CPFF	Collins Aerospace : Colorado Springs, CO	-	7.864	Oct 2020	7.291	Feb 2022	24.591		-		24.591	Continuing	Continuing	-
Female Flight Equipment	Various	Multiple Contractors : TBD	-	5.206	Dec 2020	4.727	Feb 2022	5.397		-		5.397	Continuing	Continuing	-
		Subtotal	-	23.918		21.448		40.493		-		40.493	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Direct Cite Authority	TBD	AFLCMC : Wright-Patterson AFB, OH	-	0.860	Dec 2020	1.209		1.209		-		1.209	Continuing	Continuing	-
		Subtotal	-	0.860		1.209		1.209		-		1.209	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Tests (NGES, ACES, NGFWH, etc.)	Various	Various : Various, NV	-	1.650		2.130		4.750		-		4.750	Continuing	Continuing	-
		Subtotal	-	1.650		2.130		4.750		-		4.750	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604706F / *Life Support Systems*	Project (Number/Name) 65412A / *Life Support Systems*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Administration (PMA)	TBD	AFLCMC : Wright-Patterson AFB, OH	-	1.320		0.650		0.990		-		0.990	Continuing	Continuing	-
		Subtotal	-	1.320		0.650		0.990		-		0.990	Continuing	Continuing	N/A

Remarks

PMA Description: Program Management Support and Travel.

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	27.748		25.437		47.442		-		47.442	Continuing	Continuing	N/A

Remarks

FINANCIAL PERFORMANCE: The Integrated Aircrew Ensemble (IAE) project is evaluated against traditional Research and Development (R&D) program expenditure benchmarks. Unlike many traditional R&D programs, however, the IAE contract is a FPIF contract with progress payments. "XX" 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 health.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604706F / *Life Support Systems*	**Project (Number/Name)** 65412A / *Life Support Systems*

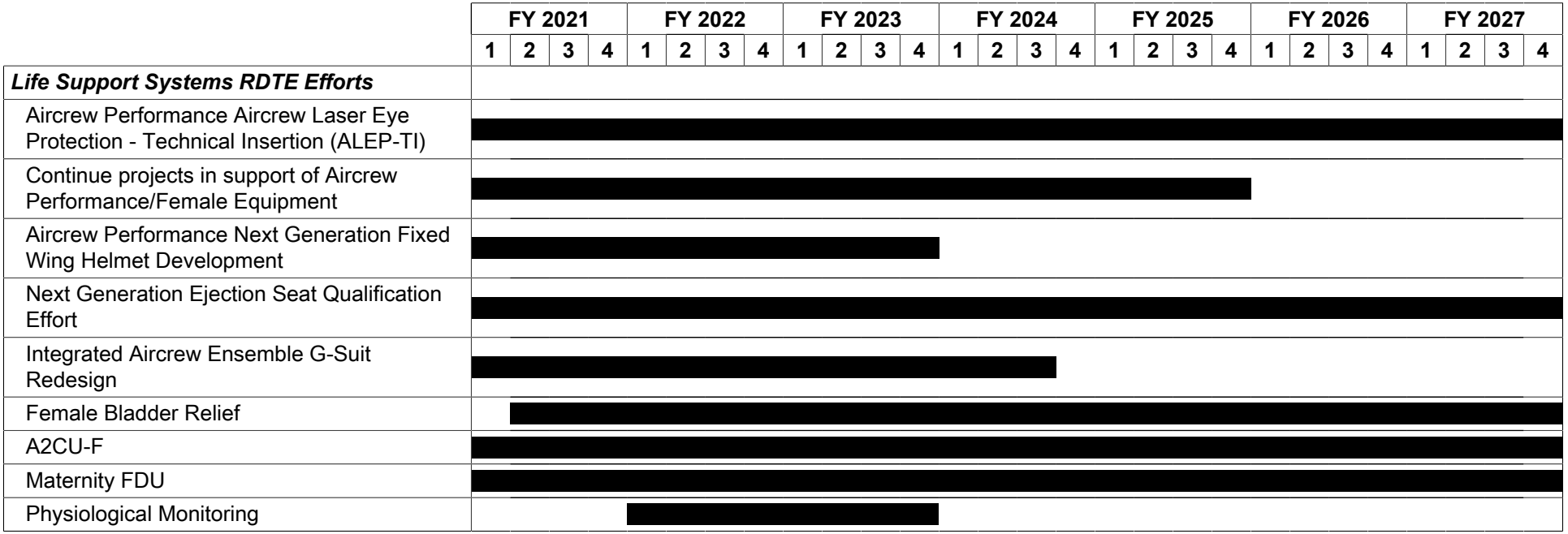

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604706F / *Life Support Systems*	**Project (Number/Name)** 65412A / *Life Support Systems*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Life Support Systems RDTE Efforts				
Aircrew Performance Aircrew Laser Eye Protection - Technical Insertion (ALEP-TI)	1	2021	4	2027
Continue projects in support of Aircrew Performance/Female Equipment	1	2021	4	2025
Aircrew Performance Next Generation Fixed Wing Helmet Development	1	2021	4	2023
Next Generation Ejection Seat Qualification Effort	1	2021	4	2027
Integrated Aircrew Ensemble G-Suit Redesign	1	2021	3	2024
Female Bladder Relief	2	2021	4	2027
A2CU-F	1	2021	4	2027
Maternity FDU	1	2021	4	2027
Physiological Monitoring	1	2022	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604735F / *Combat Training Ranges*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	23.054	23.980	91.284	0.000	91.284	182.696	234.578	54.118	61.077	Continuing	Continuing
652286: *Combat Training Range Equipment*	-	23.054	23.980	91.284	0.000	91.284	182.696	234.578	54.118	61.077	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 5, PE 0604735F, project 652286, P6 Combat Training System (P6 CTS), is a new start.

A. Mission Description and Budget Item Justification

COMBAT TRAINING RANGES (CTR): Portfolio provides electronic warfare equipment and support to Air Force combat training ranges for training, testing, and evaluation of aircrews. Development and integration efforts include: aircraft pods, radar emitters, advanced radar emitters, communication jammers, command and control and debrief capability, and instrumentation equipment. All development efforts support USAF aircraft for Joint, Coalition, and Live Virtual Constructive (LVC) training events.

ADVANCED RADAR THREAT SYSTEM (ARTS): The ARTS program will design, develop, and test threat systems based on replicating advanced foreign fielded Surface-to-Air Missile (SAM) radar and Electronic Warfare (EW) threat systems. The ARTS variants will be used at Department of Defense (DoD) test and training ranges for 4th generation, 5th generation, and 5th generation plus aircrew training and tactics development. ARTS variants are also developed for (LVC) integration and full simulation training. Efforts include but are not limited to: research, studies, technology development, engineering, and manufacturing advanced radar emitters.

MODERNIZATION RANGE THREATS SYSTEMS (RTS): The RTS program supports upgrading and modifying legacy range threat systems to provide combat training relevancy and enhanced systems capabilities. Legacy systems include Multiple Threat Emitter System (MUTES), Miniature Multiple Threat Emitter System (Mini-MUTES), Modular Threat Emitter (MTE) system, Tactical Radar Threat Generator (TRTG) system, Band Simulator, Unmanned Modular Threat Emitter (UMTE) system, and Joint Threat Emitter (JTE) system.

LIVE MISSION OPERATIONS CAPABILITY (LMOC): LMOC is an effort to modernize range control centers with common hardware and software that can support live-synthetic training missions. LMOC will provide a node-based enterprise that integrates all range system capabilities, including pre/post mission coordination, in a multi-level secure environment to enable blended live-synthetic training for 4th/5th generation aircraft and aircrew.

P5 COMBAT TRAINING SYSTEM (P5 CTS): P5 CTS is a legacy aircraft instrumentation pod used by 4th generation platforms and F-35 for training exercises. Investments include upgrading pod capability to operate in a secure environment.

P6 COMBAT TRAINING SYSTEM (P6 CTS): P6 CTS is a new start effort to replace the existing P5 CTS pods. P6 CTS will resolve existing critical training capability gaps and will enable comprehensive, realistic training environments for 4th Gen - 5th Gen aircraft systems. Key upgrades include a trusted operating system, Multiple

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604735F / *Combat Training Ranges*

Level Security (MLS) architecture, Type 1 encryption of over-air data, and increased processing capability. P6 CTS investment will support a robust Air-to-Air and Air-to-Ground combat training environment and provide a growth path to LVC exercises.

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 FY21 $0.076M was expended for civilian pay expenses in this program element, and in FY22 $0.900M 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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	23.854	23.980	0.000	0.000	0.000
Current President's Budget	23.054	23.980	91.284	0.000	91.284
Total Adjustments	-0.800	0.000	91.284	0.000	91.284
• 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	-0.800	0.000			
• Other Adjustments	0.000	0.000	91.284	0.000	91.284

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Project: 652286: *Combat Training Range Equipment*		
Congressional Add: *Training Range Instrumentation*	15.000	0.000
Congressional Add Subtotals for Project: 652286	15.000	0.000
Congressional Add Totals for all Projects	15.000	0.000

Change Summary Explanation

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604735F / *Combat Training Ranges*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: P5 Combat Training System (CTS) ***Description:*** P5 CTS is an aircraft instrumentation pod used by 4th generation platforms and F-35. Funding supports upgrading the P5 CTS pod against GPS jamming during training events. ***FY 2022 Plans:*** N/A ***FY 2023 Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A	0.500	0.000	0.000
Title: Modernization Range Threat Systems (RTS) ***Description:*** Modernization Systems efforts support upgrading and modifying legacy range threat systems to provide combat training relevancy and enhanced systems capabilities. Enhancements focus on modifying systems to accurately simulate foreign threat systems faced by combat aircrews. ***FY 2022 Plans:*** Funding supports upgrading the Miniature Multiple Threat Emitter System for threat relevancy during combat training missions and simulated surface to air missiles (SAM) warfare training. The upgrade includes a redesign of specific components eliminating hardware issues. ***FY 2023 Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreased due to the Miniature Multiple Threat Emitter System completing RDT&E efforts.	0.000	0.100	0.000
Title: Advanced Radar Threat System-Variant 1 (ARTS-V1) ***Description:*** ARTS-V1 program will design, develop, build, and test radar threat systems based on advanced strategic, long-range, re-locatable foreign fielded SAM radar threat systems. ARTS-V1 will leverage an existing DoD test resource development program to reduce non-recurring development cost, minimize schedule risk, and promote range interoperability between test and training. The focus of the program is to develop realistic radar threat systems meant to stress 5th Generation aircraft capabilities. ***FY 2022 Plans:***	6.429	0.314	0.100

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604735F / *Combat Training Ranges*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Funding supports spares used in the development of the Production Representative Article (PRA) and further development above threshold requirements. Efforts may include but not limited to furthering development associated with objective requirements radar cross section shells. Program transitioned from PRA development to low rate initial production in FY22. ***FY 2023 Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreased due to ARTS-V1 transitioning to production.			
Title: Advanced Radar Threat System-Variant 2 (ARTS-V2) ***Description:*** ARTS-V2 program will design, develop, build, and test radar emitter systems based on an advanced tactical, mobile, short/medium range foreign fielded SAM radar threat system. Development efforts include ARTS-V2 integration into LVC architecture, ongoing analyses, studies, developing high-fidelity surrogate targets, and risk reduction. ***FY 2022 Plans:*** Funding supports, but is not limited to, additional testing events. ***FY 2023 Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreased due to ARTS-V2 transitioning to production.	0.925	0.100	0.000
Title: Advanced Radar Threat System-Variant 3 (ARTS-V3) ***Description:*** ARTS-V3 program will design, develop, build, and test advanced Surface-to-Air Missile (SAM) radar threat systems. ARTS-V3 will replicate strategic/tactical threats at the fidelity necessary for 5th generation and 5th generation plus aircraft supporting multi-domain platform engagements. The ARTS-V3 requirement is to develop a modular radar threat system that has a growth path to replicate multiple advanced SAM threats and support Live Virtual Constructive (LVC) training. Efforts include but are not limited to: development of high-fidelity surrogate targets, development of threat systems, analyses, studies, and efforts focused on integrating ARTS-V3 into LVC architectures. ***FY 2022 Plans:***	0.100	23.366	73.693

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604735F / *Combat Training Ranges*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Funding supports further technology maturation leading to a full Production Representative Article (PRA) development. Activities include but are not limited to technical design reviews, digital engineering, subscale prototype efforts, integration, fabrication, and testing. ***FY 2023 Plans:*** Finalize developmental efforts for the initial ARTS-V3 production representative article (PRA) for developmental and operational testing. Efforts include but are not limited to the following: prototype development, engineering, manufacturing, training range integration, interfaces, software development, and developmental and operational tests. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increased to finalize the development of the initial ARTS-V3 representative system for developmental and operational testing.			
Title: Advanced Radar Threat System-Variant 4 (ARTS-V4) ***Description:*** ARTS-V4 program will design, develop, build, and test modern surface-to-air radar systems replicating tactical highly mobile threats at the fidelity necessary to stress current EW systems, 5th Generation and beyond air platform engagements, and be integrated into a future CAF LVC system. The ARTS-V4 system will create a relevant combat training threat system that is dynamic and represents adversary forces. Additionally funding will support ongoing analyses and studies focused on integrating ARTS into regional range and LVC architectures. ***FY 2022 Plans:*** N/A ***FY 2023 Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A	0.100	0.000	0.000
Title: Live Mission Operations Capability (LMOC) ***Description:*** LMOC is an effort to modernize training range control centers with common hardware and software that can support live-synthetic training missions. LMOC provides a node-based software enterprise that integrates all range system capabilities, including pre/post mission coordination, in a multi-level secure environment to enable blended live-synthetic training for 4th/5th generation aircraft and aircrew. ***FY 2022 Plans:***	0.000	0.100	4.864

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604735F / *Combat Training Ranges*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Funding supports development of a common hardware/software platform called "WarRoom" to each training location. Funding will also be used to fund a government Special Access Programs Security Officer dedicated to LMOC training systems. ***FY 2023 Plans:*** Funding supports continued development of "WarRoom" for all fielded locations, automated mission planning and Multi-Level Security development. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increased to support major LMOC WarRoom upgradess providing enhanced capabilities. Increased funding also supports development of a multi-level security architecture to enable tagging/processing of data at multiple security classifications.			
Title: P6 Combat Training System (P6 CTS) ***Description:*** P6 CTS is aircraft instrumentation pod that will replace the existing P5 CTS pods used for training exercises between 4th and 5th generation platforms. P6 CTS will resolve existing critical training capability gaps and will enable comprehensive, realistic training environments for 4th Gen - 5th Gen aircraft systems. Key upgrades include the following: trusted operating system, Multiple Level Security (MLS) architecture, Type 1 encryption of over-air data, and increased processing capability. ***FY 2022 Plans:*** N/A ***FY 2023 Plans:*** Funds will support but is not limited to product development, test, and aircraft integration on the F-15 and F-16. Funds will also support integrating P6 ground stations with select training ranges. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increased due to the increased level of test and evaluation activities.	0.000	0.000	12.627
Accomplishments/Planned Programs Subtotals	8.054	23.980	91.284

	FY 2021	FY 2022
Congressional Add: Training Range Instrumentation	15.000	0.000
FY 2021 Accomplishments: FY21 funding will be used for the following efforts: --ARTS-V3 funds will support live SAM-threat test and combat training missions to be delivered to the Gulf Coast Range Complex.		

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604735F / *Combat Training Ranges*

	FY 2021	FY 2022
--P5 to P6 funds will focus on Time-Space-Position-Information (TSPI) infrastructure to support emitters, electronic warfare, and live training for 4th and 5th Gen participants. The main effort will be on USAF unique requirements for the P6 to fully replace P5 capability and meet USAF unique mission-sets. --LMOC funds will develop live and constructive training infrastructure within the region to support all aspects of live training for 4th and 5th Generation platforms. ***FY 2022 Plans:*** N/A		
Congressional Adds Subtotals	15.000	0.000

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• OPAF 03 Line Item 834190: *Combat Training Ranges*	193.185	343.088	148.943	-	148.943	113.954	95.202	215.659	221.377	Continuing	Continuing
• OPAF 05 Line Item 861900: *Spares and Repair Parts*	8.241	2.866	11.241	-	11.241	0.742	0.758	0.780	0.797	Continuing	Continuing
• APAF 07 Line Item 000075: *Other Production Charges*	3.495	14.784	21.973	-	21.973	55.093	102.800	97.000	57.010	Continuing	Continuing

Remarks

E. Acquisition Strategy

The acquisition strategy varies by effort. Overall strategy is competition focused, with the use of but not limited to other transaction authority, cost plus and fixed price contracts.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604735F / *Combat Training Ranges*	**Project (Number/Name)** 652286 / *Combat Training Range Equipment*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Advanced Radar Threat System-Variant 1 (ARTS-V1) Development	Various	Georgia Tech Research : Pax River, MD	-	5.468	Oct 2020	0.251	Nov 2021	0.100	Nov 2022	-		0.100	Continuing	Continuing	-
Advanced Radar Threat System-Variant 2 (ARTS-V2)	C/FPIF	Lockheed Martin : Grand Prairie, TX	-	0.246	Sep 2021	0.080	Dec 2021	-		-		-	Continuing	Continuing	-
Advanced Radar Threat System-Variant 3 (ARTS-V3) Development	C/FFP	SAAB, LM, NG, DYNETICS : Various	-	11.620	Dec 2021	18.706	Jan 2022	64.484	Apr 2023	-		64.484	Continuing	Continuing	-
Advanced Radar Threat System-Variant 4 (ARTS-V4) Development	Various	Various : Hill AFB, UT	-	0.310	May 2021	0.081	Nov 2021	-		-		-	Continuing	Continuing	-
P6 Combat Training System	Various	Various : Various	-	-		-		2.000	Mar 2023	-		2.000	Continuing	Continuing	-
P5 Combat Training System GPS Contested	SS/FFP	Cubic Corporation : San Diego, CA	-	0.215	Jan 2021	-		-		-		-	Continuing	Continuing	-
Modernization Systems	Various	Various : Hill AFB, UT	-	-		0.080	Nov 2021	-		-		-	Continuing	Continuing	-
Live Mission Operation Capability (LMOC)	Various	Georgia Tech Research : Various	-	1.068	May 2021	-		4.700	Jan 2023	-		4.700	Continuing	Continuing	-
		Subtotal	-	18.927		19.198		71.284		-		71.284	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Advanced Radar Threat Systems (Direct Msn Spt)	Various	Various : Various	-	2.016	Dec 2020	0.250	Dec 2021	2.000	Dec 2022	-		2.000	Continuing	Continuing	-
Advanced Radar Threat Systems (Direct Cite Authority Civ Pay)	Various	Various : Various	-	0.076	Dec 2020	0.900	May 2022	1.000	Feb 2023	-		1.000	Continuing	Continuing	-
		Subtotal	-	2.092		1.150		3.000		-		3.000	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604735F / *Combat Training Ranges*	**Project (Number/Name)** 652286 / *Combat Training Range Equipment*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Advanced Radar Threat Systems (Direct Msn Spt)	C/Various	Not specified. : TBD	-	0.770	Oct 2020	1.473	Oct 2021	3.500	Dec 2022	-		3.500	Continuing	Continuing	-
P6 Combat Training System	C/Various	Not specified. : TBD	-	-		-		9.750	Jan 2023	-		9.750	Continuing	Continuing	-
		Subtotal	-	0.770		1.473		13.250		-		13.250	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Advanced Radar Threat Systems (Program Support Cost)	Various	Various : Hill AFB, UT	-	1.265	May 2021	2.050	May 2022	3.000	Dec 2022	-		3.000	Continuing	Continuing	-
Live Mission Operations Capability (Program Support Cost)	Various	AFLCMC/XA : Hill AFB, UT	-	-		0.100	Dec 2021	0.300	Nov 2022	-		0.300	Continuing	Continuing	-
P6 Combat Training System (Program Support Cost)	Various	Various : Hill AFB, UT	-	-		-		0.450	Feb 2023	-		0.450	Continuing	Continuing	-
Modernization Systems (Program Support Cost)	Various	AFLCMC/XA : Hill AFB, UT	-	-		0.009	Oct 2021	-		-		-	Continuing	Continuing	-
		Subtotal	-	1.265		2.159		3.750		-		3.750	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	23.054		23.980		91.284		-		91.284	Continuing	Continuing	N/A

Remarks

"FINANCIAL PERFORMANCE: "Advanced Radar Threat System - Variant Two (ARTS-V2) is evaluated against traditional Research and Development (R&D) program expenditure benchmarks. Unlike many traditional R&D programs, however, the ARTS-V2 EMD contract is a FPIF contract with progress payments. 20 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 health."

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604735F / *Combat Training Ranges*	**Project (Number/Name)** 652286 / *Combat Training Range Equipment*

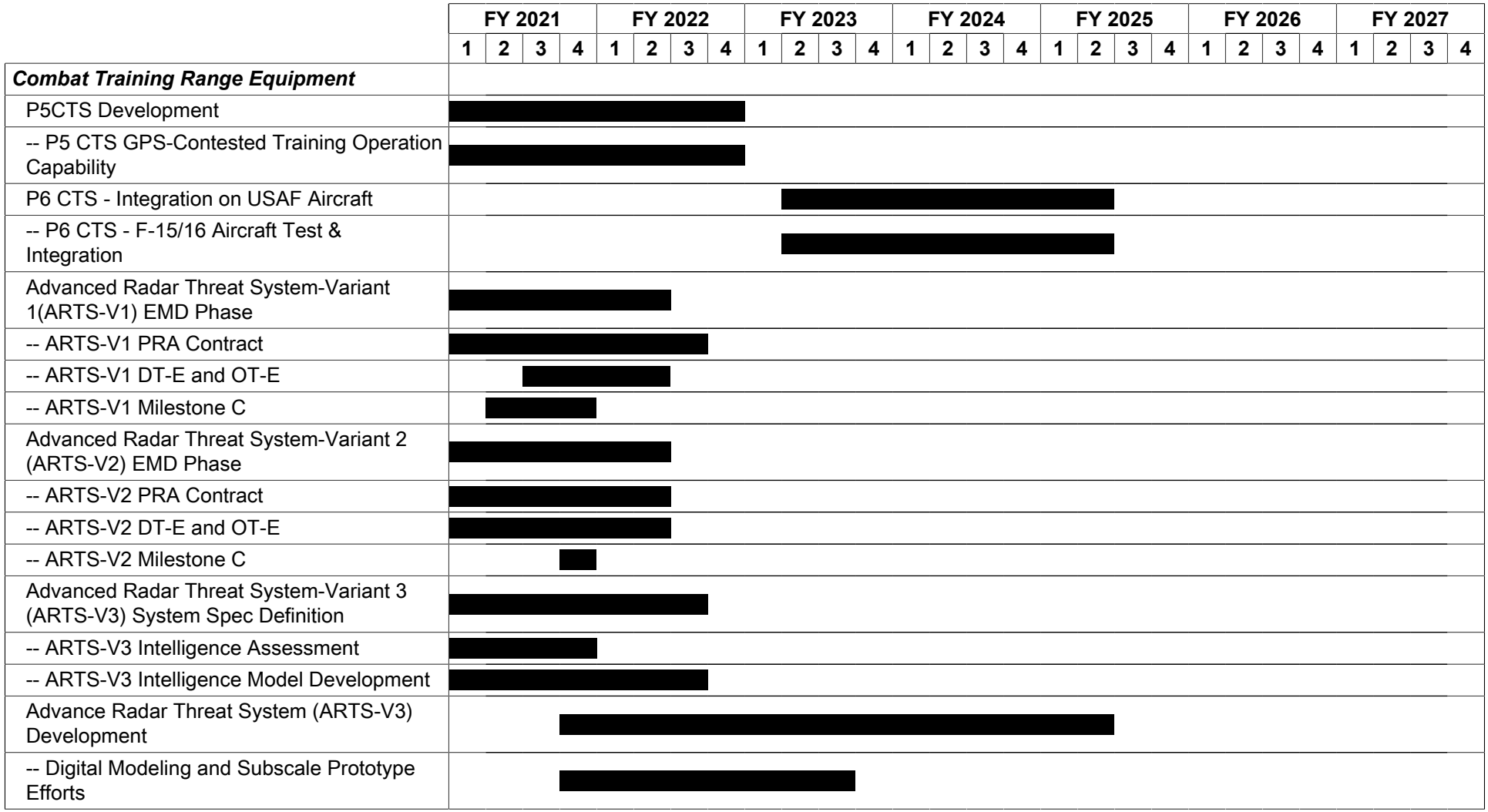

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604735F / *Combat Training Ranges*	**Project (Number/Name)** 652286 / *Combat Training Range Equipment*

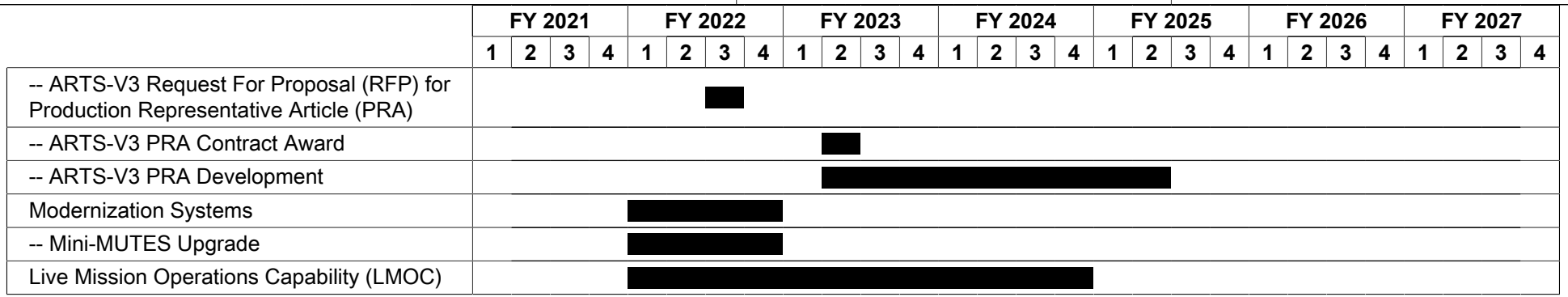

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604735F / *Combat Training Ranges*	**Project (Number/Name)** 652286 / *Combat Training Range Equipment*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Combat Training Range Equipment				
P5CTS Development	1	2021	4	2022
-- P5 CTS GPS-Contested Training Operation Capability	1	2021	4	2022
P6 CTS - Integration on USAF Aircraft	2	2023	2	2025
-- P6 CTS - F-15/16 Aircraft Test & Integration	2	2023	2	2025
Advanced Radar Threat System-Variant 1(ARTS-V1) EMD Phase	1	2021	2	2022
-- ARTS-V1 PRA Contract	1	2021	3	2022
-- ARTS-V1 DT-E and OT-E	3	2021	2	2022
-- ARTS-V1 Milestone C	2	2021	4	2021
Advanced Radar Threat System-Variant 2 (ARTS-V2) EMD Phase	1	2021	2	2022
-- ARTS-V2 PRA Contract	1	2021	2	2022
-- ARTS-V2 DT-E and OT-E	1	2021	2	2022
-- ARTS-V2 Milestone C	4	2021	4	2021
Advanced Radar Threat System-Variant 3 (ARTS-V3) System Spec Definition	1	2021	3	2022
-- ARTS-V3 Intelligence Assessment	1	2021	4	2021
-- ARTS-V3 Intelligence Model Development	1	2021	3	2022
Advance Radar Threat System (ARTS-V3) Development	4	2021	2	2025
-- Digital Modeling and Subscale Prototype Efforts	4	2021	3	2023
-- ARTS-V3 Request For Proposal (RFP) for Production Representative Article (PRA)	3	2022	3	2022
-- ARTS-V3 PRA Contract Award	2	2023	2	2023
-- ARTS-V3 PRA Development	2	2023	2	2025
Modernization Systems	1	2022	4	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604735F / *Combat Training Ranges*	**Project (Number/Name)** 652286 / *Combat Training Range Equipment*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
-- Mini-MUTES Upgrade	1	2022	4	2022
Live Mission Operations Capability (LMOC)	1	2022	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604800F / *F-35 - EMD*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	5.214	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.214
653831: *Joint Strike Fighter*	0.000	5.214	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.214
Program MDAP/MAIS Code: 198												

A. Mission Description and Budget Item Justification

The F-35 Joint Strike Fighter (JSF) Program will develop and field an affordable, highly common family of next generation strike aircraft for the USN, USAF, USMC and allies. The three variants are the F-35A Conventional Takeoff and Landing; F-35B Short Takeoff and Vertical Landing; and the F-35C Aircraft Carrier suitable variant. The F-35A will be a stealthy multi-role aircraft, primary air-to-ground for the Air Force to replace the F-16 and A-10 and complement the F-22. The F-35B variant will be a multi-role strike fighter aircraft to replace the AV-8B and F/A-18 for the Marine Corps, replace the Sea Harrier and GR 7 for the United Kingdom, and replace the AV-8 currently employed by the Italian Navy. The F-35C will provide the Department of the Navy a multi-role, stealthy strike fighter aircraft to complement the F/A-18E/F.

The United Kingdom, Italy, Netherlands, Canada, Australia, Denmark, Norway, and Foreign Military Sales customers are also participants in the JSF program. The program shown here reflects USN, USMC, USAF, and International Partner funding.

Funding at the accomplishment/planned program level is reported as the total of all services and partners as these activities support all aircraft variants.

The System Development and Demonstration (SDD) budget funds a total quantity of 20 RDT&E test articles to include 6 ground test articles and 14 flight test articles for USN, USAF, and USMC use.

FY07: 1 F-35A flight test article
FY08: 1 F-35B flight test article; 1 F-35B ground test article
FY09: 1 F-35B flight test article; 2 F-35A ground test articles
FY10: 6 flight test articles: 3 F-35A, 2 F-35B, 1 F-35C; 3 ground test articles: 1 F-35B, 2 F-35C
FY11: 4 flight test articles: 1 F-35A,1 F-35B, 2 F-35C
FY13: 1 F-35C flight test article

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 FY21 $0 was expended for civilian pay expenses in this program element, and in FY22 $0 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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force					Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*		R-1 Program Element (Number/Name) PE 0604800F / *F-35 - EMD*			
B. Program Change Summary ($ in Millions)	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**
Previous President's Budget	5.413	0.000	0.000	0.000	0.000
Current President's Budget	5.214	0.000	0.000	0.000	0.000
Total Adjustments	-0.199	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	-0.199	0.000	0.000	0.000	0.000

Change Summary Explanation

No significant changes.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604800F / *F-35 - EMD*	Project (Number/Name) 653831 / *Joint Strike Fighter*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
653831: *Joint Strike Fighter*	0.000	5.214	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.214
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Total cost for the United States Air Force (USAF) funding are: FY21 $5.214M, FY22 $0.000M, and FY23 $0.000M. R-2 data reflects variant unique funding only.

R-2A(section B)/R-3 displays USAF funding only.

F-35 EMD Includes:
USAF PE 0604800F BPAC 653831

A. Mission Description and Budget Item Justification

The F-35 Joint Strike Fighter (JSF) Program will develop and field an affordable, highly common family of next generation strike aircraft for the USN, USAF, USMC and allies. The three variants are the F-35A Conventional Takeoff and Landing; F-35B Short Takeoff and Vertical Landing; and the F-35C Aircraft Carrier suitable variant. The F-35A will be a stealthy multi-role aircraft, primary air-to-ground for the Air Force to replace the F-16 and A-10 and complement the F-22. The F-35B variant will be a multi-role strike fighter aircraft to replace the AV-8B and F/A-18 for the Marine Corps, replace the Sea Harrier and GR 7 for the United Kingdom, and replace the AV-8 currently employed by the Italian Navy. The F-35C will provide the Department of the Navy a multi-role, stealthy strike fighter aircraft to complement the F/A-18E/F.

The United Kingdom, Italy, Netherlands, Canada, Australia, Denmark, Norway, and Foreign Military Sales customers are also participants in the JSF program. The program shown here reflects USN, USMC, USAF, and International Partner funding.

The top-line Program Element reflects the unique variant for each Service. Funding at the accomplishment/planned program level is reported as the total of all services and partners as these activities support all aircraft variants.

The System Development and Demonstration (SDD) budget funds a total quantity of 20 RDT&E test articles to include 6 ground test articles and 14 flight test articles for USN, USAF, and USMC use.

FY07: 1 F-35A flight test article
FY08: 1 F-35B flight test article; 1 F-35B ground test article
FY09: 1 F-35B flight test article; 2 F-35A ground test articles
FY10: 6 flight test articles: 3 F-35A, 2 F-35B, 1 F-35C; 3 ground test articles: 1 F-35B, 2 F-35C
FY11: 4 flight test articles: 1 F-35A, 1 F-35B, 2 F-35C
FY13: 1 F-35C flight test article

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604800F / *F-35 - EMD*	**Project (Number/Name)** 653831 / *Joint Strike Fighter*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: System Development and Demonstration (SDD) (F-35 JSF) ***Description:*** SDD execution of the Air System with Lockheed Martin, including International Commonality Effort which includes airframe, vehicle systems, mission systems, autonomic logistics, systems engineering, and integrated test efforts. ***FY 2022 Plans:*** Continue SDD execution of Air System with Lockheed Martin, including International Commonality Effort which includes, airframe, vehicle systems, mission systems, autonomic logistics, systems engineering, and integrated test efforts. Activity aligned to IMS in accordance with variant IOC. Continue to conduct SDD closure activities including FCA/PCA (Functional Configuration Audit/Production Configuration Audit) in order to establish production specification and transition to post-SDD, production and sustainment. ***FY 2023 Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A	5.214	0.000	0.000
Title: Test and Evaluation (T&E) (F-35 JSF) ***Description:*** Government-executed Initial Operational Test & Evaluation (IOT&E) activities. Elements of IOT&E include preparation, execution, & evaluation of flight and ground based tests which assess all aspects (lethality, mission effectiveness, cyber security) of the F-35 Air System in an operationally relevant environment. ***FY 2022 Plans:*** N/A ***FY 2023 Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A	0.000	0.000	0.000
Title: Development Support (F-35 JSF) ***Description:*** SDD Support efforts for airframe, air vehicle systems, mission systems, weapons integration, mission support, and autonomic logistics development activities. ***FY 2022 Plans:***	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604800F / *F-35 - EMD*	**Project (Number/Name)** 653831 / *Joint Strike Fighter*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
N/A ***FY 2023 Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	5.214	0.000	0.000
Other Service Funding Adjustment	0.000	0.000	-
Air Force Subtotals	5.214	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• RDTE 05 0604800N 2261: *JSF SDD (CV)*	0.240	0.262	0.234	-	0.234	0.235	0.235	0.237	0.241	0.000	1.684
• RDTE 05 0604800N 2262: *JSF SDD (STOVL)*	0.539	0.577	0.611	-	0.611	0.625	0.636	0.649	0.659	0.000	4.296

Remarks

This is a joint program with no executive service. Service Acquisition Execution (SAE) authority alternates between the Department of the Navy and the Department of the Air Force and currently resides with the Navy.

Program Element 0604800N/0604800M continues USN development efforts budgeted in 0603800N prior to 2002.

The United Kingdom, Italy, Netherlands, Canada, Australia, Denmark, and Norway are participants in the SDD phase of JSF.

RELATED RDT&E: Funding prior to JSF SDD (FY94-FY01): USN PE 0603800N $1,950.617M; USAF PE 0603800F $1,907.352M; DARPA PE 0603800E $118.056M; and International Partner contributions of $253.921M for a total of $4,229.946M.

D. Acquisition Strategy

The SDD program consists of a cost-reimbursement contract awarded to Lockheed Martin Aeronautics Company to develop the F-35 Air System, consisting of three aircraft variants and its associated logistics support system, for the U.S. Services and international participants. Similarly, a cost-reimbursement contract was awarded to Pratt & Whitney to develop the F135 propulsion system. Ground and flight testing will be conducted during development to accomplish validation and verification, with the extensive use of modeling and simulation to offset the risk of this large, complex, and concurrent lifecycle program. A comprehensive logistics support environment, including an integrated training system for aircrew, maintenance, and support personnel, is also being developed.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604800F / *F-35 - EMD*	**Project (Number/Name)** 653831 / *Joint Strike Fighter*

On 25 April 2011, the Department of Defense terminated the development of the General Electric Rolls-Royce Fighter Engine Team F136 propulsion system.

The F-35 Program has made international involvement a key element of the acquisition strategy. This includes international partnership in the development, production, and sustainment phases of the lifecycle. Additional international participation includes Foreign Military Sales arrangements.

In Fiscal Year (FY) 2007, separate cost-type contracts were awarded to Lockheed Martin Aeronautics Company and Pratt & Whitney to begin low rate initial production for F-35 air vehicles, propulsion systems, and sustainment for the fielded systems. Transition to fixed-price-type procurement contracts occurred with the fourth low rate lot. To provide logistics support for delivered aircraft, Performance-Based Logistics cost-type contracts will be awarded to Lockheed Martin Aeronautics Company and Pratt & Whitney.

At the completion of Low Rate Initial Production, a Defense Acquisition Board review, and Milestone Decision Authority approval, the F-35 Program will enter Full Rate Production. Fixed-price procurement contracts will be awarded for F-35 air vehicles and propulsion systems for the U.S. Services and international participants. Multiyear procurement authority for the F-35 Air System will be requested for Full Rate Production. Concurrently, multiple-year, fixed-price-type Performance Based Logistics contracts for sustainment will be requested to support multi-Service and multi-national requirements.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604800F / *F-35 - EMD*	**Project (Number/Name)** 653831 / *Joint Strike Fighter*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	C/CPAF	Not specified. : TBD	0.000	0.000		-		-		-		-	0.000	0.000	0.000
Lockheed Martin - SDD	SS/CPIF	Lockheed Martin : Ft. Worth, TX	0.000	5.214	Dec 2020	-		-		-		-	0.000	5.214	32,495.150
Lockheed Martin - SDD Fee	SS/CPIF	Lockheed Martin : Ft. Worth, TX	0.000	0.000		-		-		-		-	0.000	0.000	1,754.193
Prior Year No Longer Funded in FYDP	Various	Various : TBD	0.000	0.000		-		-		-		-	0.000	0.000	0.000
		Subtotal	0.000	5.214		-		-		-		-	0.000	5.214	N/A

Remarks

Contract type prior to 2013 was CPAF.
Cumulative Award Fee earned in prior years for Lockheed Martin is 97%.
Cumulative Award Fee earned in prior years for Pratt and Whitney is 98%.

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Subtotals	0.000	5.214		-		-		-		-	0.000	5.214	N/A
Other Service Funding Adjustment	-	0.000		0.000		-		-		-			-
Project Cost Totals	0.000	5.214		-		-		-		-	0.000	5.214	-

Remarks

The project information shown here reflects USN, USMC, USAF and International Partner funding total for each contract. By agreement USN and USMC funding shares are approximately equal and when combined are equal to the USAF share.

NOTE 1: Prior Years reflect $22,320.707M USAF
FY 2021 reflects $ 5.214M USAF
FY 2022 and beyond reflects $ 0.000M USAF

JSF EMD Includes:
USAF PE 0604800F BPAC 653831

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604800F / *F-35 - EMD*	**Project (Number/Name)** 653831 / *Joint Strike Fighter*

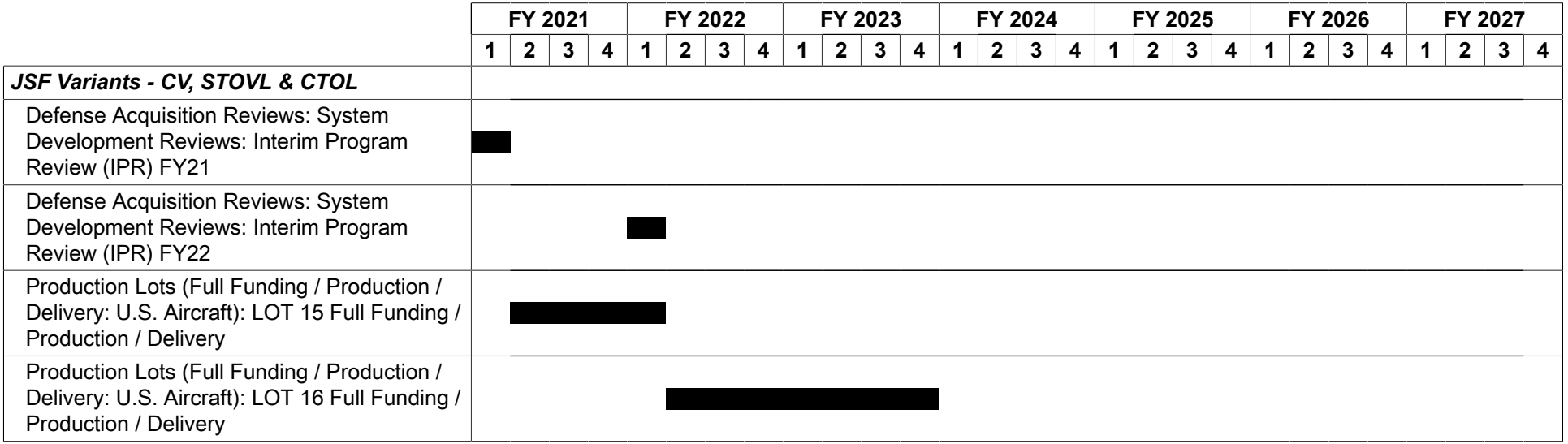

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604800F / *F-35 - EMD*	**Project (Number/Name)** 653831 / *Joint Strike Fighter*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
JSF Variants - CV, STOVL & CTOL				
Defense Acquisition Reviews: System Development Reviews: Interim Program Review (IPR) FY21	1	2021	1	2021
Defense Acquisition Reviews: System Development Reviews: Interim Program Review (IPR) FY22	1	2022	1	2022
Production Lots (Full Funding / Production / Delivery: U.S. Aircraft): LOT 15 Full Funding / Production / Delivery	2	2021	1	2022
Production Lots (Full Funding / Production / Delivery: U.S. Aircraft): LOT 16 Full Funding / Production / Delivery	2	2022	4	2023

Note

Schedule details reflect fiscal years

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604932F / *Long Range Standoff Weapon*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	1,898.362	373.499	599.042	928.850	0.000	928.850	964.245	720.878	599.740	278.122	85.600	6,448.338
657011: *LONG RANGE STAND-OFF*	1,898.362	373.499	599.042	928.850	0.000	928.850	964.245	720.878	599.740	278.122	85.600	6,448.338
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Program MDAP/MAIS Code: 489												

A. Mission Description and Budget Item Justification

The Long Range Stand Off (LRSO) Cruise Missile is a long range survivable stand-off weapon capable of delivering lethal nuclear effect on strategic targets. LRSO will replace the currently fielded Air Launched Cruise Missile (ALCM) and will be integrated on both legacy and future bomber aircraft. The LRSO weapon system will be capable of penetrating and surviving advanced Integrated Air Defense Systems (IADS) from significant stand-off range to prosecute strategic targets in support of the Air Force's global attack capability and strategic deterrence core function.

Funds may be used to address emerging or short-notice Diminishing Manufacturing and Material Shortage (DMSMS) issues.

The program is conducting Development, Verification, and Test activities to execute design maturation, reliability growth and manufacturing maturation to support Critical Design Review. The program is also conducting Engineering and Manufacturing Development tasks to validate requirements to support Development and Operational Testing and Production Readiness.

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. In FY21 $0.618M was expended for civilian pay expenses in this program element, and in FY22 $0 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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604932F / *Long Range Standoff Weapon*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	384.727	609.042	0.000	0.000	0.000
Current President's Budget	373.499	599.042	928.850	0.000	928.850
Total Adjustments	-11.228	-10.000	928.850	0.000	928.850
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-10.000			
• 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	-11.228	0.000			
• Other Adjustments	0.000	0.000	928.850	0.000	928.850

Change Summary Explanation

FY2021 reduction for Small Business Innovative Research (SBIR)

FY2022 Congressional reduction of 10.000M for "Re-phase funds for EMD contract award."

The FY2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, any additional explanation of the change between the two budget positions for FY 2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Long Range Stand-Off (LRSO) Weapon Development	305.933	489.848	764.540
Description: Long Range Standoff weapon development includes the Cruise Missile, the logistics support systems, mission planning and sub-system test and evaluation. ***FY 2022 Plans:*** Program will continue to design, develop, integrate and test the LRSO system through the EMD contract. Specific areas of concentration will include: - qualification testing and nuclear hardness testing in support of component selection assessment. - continue sub-system critical design reviews in preparation for System Critical Design Review, ensuring the design adequately meets the warfighter's performance requirements in the Capabilities Development Document (CDD). - systems engineering and early demonstrated flight testing to own the technical baseline for requirements traceability. - activities to support reliability growth, manufacturability, and maintainability.			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604932F / *Long Range Standoff Weapon*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
- continue test activities, such as, but not limited to, envelope testing, separation control testing and powered flight. ***FY 2023 Plans:*** The program will continue to design, develop, integrate and test the LRSO weapon system through the Engineering and Manufacturing Development contract. Activities include, but are not limited to, the following: - continue efforts to finalize the system design and conduct verification and test activities in support of the Critical Design Review. - continue reliability growth, manufacturability, and maintainability maturation activities in preparation for formal Development Test and Evaluation activities. - continue systems engineering activities focusing on design for reliability and design for manufacturing tenants. - continue test activities, such as, but not limited to, continued envelope testing and weapon system flight tests. - continue planning for Production Readiness Reviews prior to the build of the Initial Operational Test & Evaluation (IOT&E) units. - continue qualification and nuclear hardness testing to verify the system operates in intended environments. - continue planning and development of the logistics support systems. - produce associated trainers, test equipment and support equipment. - continue to plan, develop, and mature support systems to include Common Support Equipment/Peculiar Support Equipment and transportation equipment. - continue planning for the use of Model Based System Engineering tools during Operations and Sustainment phase in order to transform supply chain management. - continue to mature the weapon system by conducting trade studies, system engineering, test activities, and system modeling and simulation. - continue to further develop analytical, information technology, and data management capabilities. - continue to implement information systems and information technology design to support EMD execution. - continue to expand and mature the analytical, information technology, test, and data management capabilities to ensure access to weapon system design information is properly controlled and securely transmitted between government and contractors. - continue to modify, modernize, and expand the analytic environment and labs to support EMD activities to enable full execution of the program's capability to own the technical baseline throughout the program life cycle. This involves establishing a digital engineering system including a supporting environment/infrastructure to perform digital activities, collaborate with and communicate across stakeholders. - continue to plan and execute critical software risk reduction activities. - continue to, through best program practices, ensure the following are met: requirements flow down, requirement allocation to hardware and software, and the requirements compliance matrix. ***FY 2022 to FY 2023 Increase/Decrease Statement:***			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604932F / *Long Range Standoff Weapon*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Funding increased due to prime contractor and subcontractor manpower and material increases to support verification activities in support and conduct the Critical Design Review (CDR). Additionally, activities after CDR for the purchase of hardware in support of Developmental Test and Evaluation (DT&E) ramp up.			
Title: All-Up-Round	37.058	73.912	127.631
Description: All-Up-Round activities include payload integration and platform integration. Further, these efforts include activities and assets related to weapon design compatibility and qualification, and other nuclear certification activities with both threshold and objective aircraft. ***FY 2022 Plans:*** Continue program practices that ensure the following are met: - requirements flow down, requirement allocation to hardware and software, requirements compliance matrix, system performance, reliability, maintainability, product assurance, testability, producibility and supportability. - facility and security infrastructure upgrades to enable secure connectivity and communication between Department of Defense (DoD), Department of Energy (DOE), and industry. - efforts to conduct parallel development, design, and test activities with the DOE to ensure the LRSO adequately integrates the DOE designed warhead into the system. - safety studies and other nuclear certification activities. - aircraft Integration efforts including activities associated with integration on threshold aircraft and aircraft mission planning system upgrades to accommodate the new weapon. - activities and assets related to weapon design compatibility and qualification, and other nuclear certification with both threshold and objective aircraft. - development of mission planning upgrade needs, OFP development and integration to deliver the OFP test tapes, planning activities necessary to integrate LRSO with aircraft, and ensuring the logical, electrical, and physical interfaces of the LRSO as defined in the ICD. ***FY 2023 Plans:*** The program will: - continue through program practices to ensure the following are met: requirements flow down, requirement allocation to hardware and software, requirements compliance matrix, system performance, reliability, maintainability, product assurance, testability, producibility and supportability. - continue facility and security infrastructure upgrades to enable secure connectivity and communication between Department of Defense (DoD), Department of Energy (DOE), and industry. - continue efforts to conduct parallel development, design, and test activities with the DOE to ensure the LRSO adequately integrates the DOE designed warhead into the system.			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604932F / *Long Range Standoff Weapon*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
- conduct safety studies and nuclear certification activities. - continue to perform aircraft integration efforts including activities associated with integration on threshold aircraft and aircraft mission planning system upgrades to accommodate the new weapon. - conduct joint DoD and DOE ground and flight activities to verify the missile to warhead interface and demonstrate the system meets performance specifications. - continue to collaborate with National Nuclear Security Administration to ensure seamless integration of DOE warhead assets into the cruise missile. - continue to execute and improve the unified certification strategy which meets nuclear surety, cyber security, and nuclear safety requirements. - continue other activities necessary for All-Up-Round integration. These efforts include: developing mission planning upgrade needs, Operational Flight Program (OFP) development and integration to deliver the OFP test tapes, planning activities necessary to integrate LRSO with aircraft, and ensuring the logical, electrical, and physical interfaces of the LRSO as defined in the Interface Control Document (ICD). ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increased due to ramp up and increased level of effort of aircraft integration and warhead integration activities to support a successful CDR and increased aircraft carriage equipment hardware prior to developmental flight test.			
Title: Test Support ***Description:*** Conduct Test Support activities to support weapon development ***FY 2022 Plans:*** Continue to: - perform design validation, verification, test, nuclear certification (to include design and operational certification) and system qualification activities. - perform weapon system environment testing. - continue test planning and execution activities to support LRSO weapon development, All-Up-Round technical integration, and aircraft integration. ***FY 2023 Plans:*** The Government formally arranges and funds the use of Government flight test support for ground and flight test activities. The program will: - continue to perform design validation, verification, test, nuclear certification activities (to include design and operational certification) and system qualification activities.	30.508	35.282	36.679

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604932F / *Long Range Standoff Weapon*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
- continue test planning and execution activities to support LRSO weapon development, All-Up-Round technical integration, warhead integration and aircraft integration. - continue coordination with external test agencies in preparation for operational and post-production flight testing. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increased due to expanded aircraft integration testing, continued EMD flight testing, and pre-DT&E execution.			
Accomplishments/Planned Programs Subtotals	373.499	599.042	928.850

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• MPAF 02 MLRSO1: *Long Range Stand-Off Weapon*	0.000	0.000	31.454	-	31.454	69.238	139.963	302.973	1,096.067	8,129.822	9,769.517
• OPAF 03 833140: *Strategic Command And Control*	0.000	0.000	20.442	-	20.442	0.000	0.000	0.000	0.000	0.000	20.442

Remarks

E. Acquisition Strategy

The acquisition strategy focuses on the development of the All Up Round Weapon System, integration with the nuclear warhead, executing aircraft integration activities, and conducting test and evaluation with a continued robust reliability and manufacturing approach. The program obtained a successful MS A decision in July 2016 and subsequently released a Request for Proposals. The program competitively selected two prime contractors in August 2017 to execute the Technology Maturation and Risk Reduction (TMRR) phase. The selected prime contractors executed the Cost-Plus-Fixed-Fee (CPFF) contracts during TMRR with activities focused on developing and maturing subsystem and system designs. In FY20, LRSO pivoted to sole source TMRR contractor, enabling Development RFP (dRFP) release & MS B. MS B was approved via an Acquisition Decision Memorandum in June 2021 and a contract for Engineering and Manufacturing Development was awarded in July 2021.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604932F / *Long Range Standoff Weap on*	Project (Number/Name) 657011 / *LONG RANGE STAND-OFF*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Long Range Standoff Weapon Development	SS/CPFF	Various : TBD	1,523.203	274.224	Oct 2020	453.671	Oct 2021	727.751	Oct 2022	-		727.751	2,041.086	5,019.935	-
		Subtotal	1,523.203	274.224		453.671		727.751		-		727.751	2,041.086	5,019.935	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Aircraft Integration Planning	Various	Various : TBD	81.910	25.182	Oct 2020	29.996	Oct 2021	22.300	Oct 2022	-		22.300	48.100	207.488	-
All-Up-Round Activities	Various	Various : TBD	42.294	11.876	Jan 2021	43.916	Jan 2022	105.331	Oct 2022	-		105.331	250.992	454.409	-
		Subtotal	124.204	37.058		73.912		127.631		-		127.631	299.092	661.897	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support	Various	Various : TBD	121.360	30.508	Jan 2021	35.282	Jan 2022	36.679	Jan 2023	-		36.679	202.237	426.066	-
		Subtotal	121.360	30.508		35.282		36.679		-		36.679	202.237	426.066	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Administration	Various	Various : TBD	129.595	31.709	Oct 2020	36.177	Oct 2021	36.789	Oct 2022	-		36.789	106.170	340.440	-
		Subtotal	129.595	31.709		36.177		36.789		-		36.789	106.170	340.440	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604932F / *Long Range Standoff Weapon*	Project (Number/Name) 657011 / *LONG RANGE STAND-OFF*	

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,898.362	373.499		599.042		928.850		-		928.850	2,648.585	6,448.338	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604932F / *Long Range Standoff Weapon*	**Project (Number/Name)** 657011 / *LONG RANGE STAND-OFF*

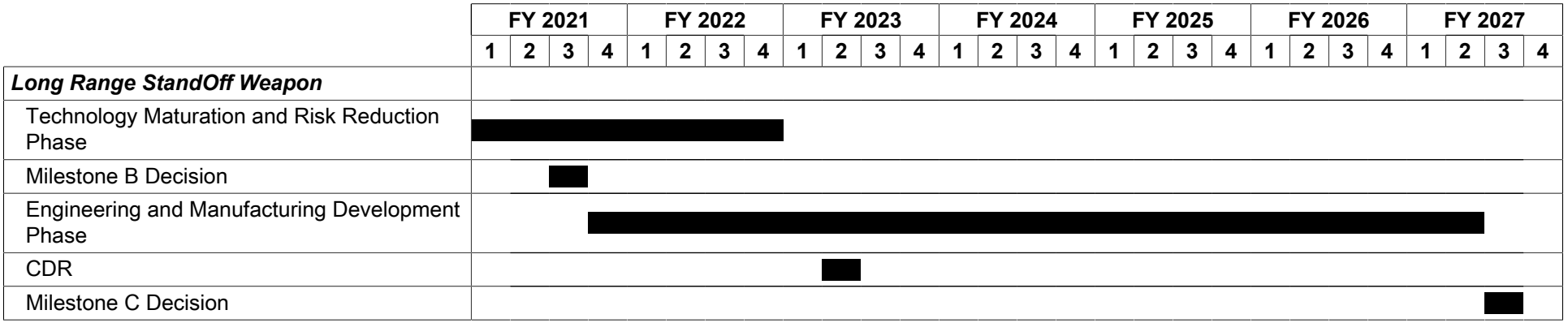

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604932F / *Long Range Standoff Weapon*	**Project (Number/Name)** 657011 / *LONG RANGE STAND-OFF*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Long Range StandOff Weapon				
Technology Maturation and Risk Reduction Phase	1	2021	4	2022
Milestone B Decision	3	2021	3	2021
Engineering and Manufacturing Development Phase	4	2021	2	2027
CDR	2	2023	2	2023
Milestone C Decision	3	2027	3	2027

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604933F / *ICBM Fuze Modernization*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	1,001.576	151.158	129.709	98.376	0.000	98.376	72.756	14.329	0.000	0.000	0.000	1,467.904
655082: *ICBM FUZE SUPPORT*	1,001.576	151.158	129.709	98.376	0.000	98.376	72.756	14.329	0.000	0.000	0.000	1,467.904
Quantity of RDT&E Articles	46	-	27	5	-	5	10	-	-	-		
Program MDAP/MAIS Code: 0498												

Note

• Prior year RDT&E includes $9.740M in PE 0604222F FY11 and $39.717M in PE 0604851F FY12

A. Mission Description and Budget Item Justification

The Intercontinental Ballistic Missile (ICBM) Fuze Modernization Program is designing and developing a form, fit and functionally equivalent replacement for the Mk21 fuze that will provide a 30-year objective design life. The legacy Mk21 fuze is three times past its design life and ongoing Mk21 fuze refurbishment does not meet Nuclear Weapon Stockpile Plan requirements. The Mk21 reentry vehicle and fuze will be deployed on the current Minuteman III (MM III) and future Ground Based Strategic Deterrent (GBSD) Weapon Systems.

The US Air Force (USAF) will develop the Mk21 fuze using the National Nuclear Security Administration (NNSA) complex and the weapons system integration contractor. The NNSA complex consists of Sandia National Labs-California [SNL-CA], Sandia National Labs-New Mexico [SNL-NM] and Kansas City National Security Campus [KCNSC], formerly Kansas City Plant. The ICBM Fuze Modernization program will leverage technologies, parts, components and development/production capabilities resulting from extensive fuze work performed by the US Navy (USN) and NNSA on the Mk5/W88 Alt 370 Fuze program. The Radar Module remains entirely common with MK5 Alt-370, while the Pathlength Module and Thermal Battery Assembly designs and qualification activities remain highly leveraged and only contain minor differences from their USN counterparts. Significant design aspects of the Missile Interface Controller Module, Launch Safety Device, and the Terminal Protection Device are also similar to their USN counterparts. The Firing Set Interface Module shares common technology with the W88 Alt-370 Firing Set.

The ICBM Fuze Modernization Program will integrate the replacement fuze into MM III and the future GBSD weapon systems, to include support/test equipment, data, flight test hardware, and training materials. The program will also conduct required system testing (including ground and flight tests). The program is coordinating Mk21 fuze replacement development efforts with the DOE to synchronize USAF arming and fuze development activities with DOE warhead requirements. When prudent, the program will conduct trade studies and initiate conceptual designs to address operational system issues and meet future requirements.

The Fiscal Year 2023 budget request continues cooperative efforts with the USN to leverage common components; conduct qualification tests; and continue development of lab, ground, and flight test assets. This program also includes any needed nuclear surety and certification and system vulnerability assessments.

As a cooperative USAF, USN and NNSA acquisition, the USAF is executing the program using Department of Defense (DoD)-DOE Manual 5030.55 Joint Nuclear Weapons Life Cycle Activities (Phase 6.X process) while meeting Major Defense Acquisition Program (MDAP) statutory requirements. The Phase 6.X process is an

iterative process that drives overlap and concurrency between activities and events that occur during the Engineering and Manufacturing Development (EMD) and Production and Deployment phases of the DoD 5000 Acquisition Series.

This program entered Phase 6.4 "Production Engineering" of the 6.X process Jan 2019. The program will conduct production engineering tasks aimed at meeting validated requirements prior to Phase 6.5.

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 0605833F or 0605831F. In FY2021 0.000M was expended for civilian pay expenses in this program element, and in FY2022 0.000M 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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	156.693	129.709	0.000	0.000	0.000
Current President's Budget	151.158	129.709	98.376	0.000	98.376
Total Adjustments	-5.535	0.000	98.376	0.000	98.376
• 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	-5.535	0.000			
• Other Adjustments	0.000	0.000	98.376	0.000	98.376

Change Summary Explanation

FY2021 funding reflects a Small Business Innovation Research transfer of $5.535 million.
The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY 2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Fuze Design and Development	133.758	110.177	79.076
Description: Design and develop the Mk21 fuze required to support the ICBM W87 warhead. Coordinate design and development efforts with the ICBM weapon system integrator and support flight testing.			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604933F / *ICBM Fuze Modernization*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY 2022 Plans: • Conduct Flight Test Unit 3 testing and activities • Conduct Mass Properties Test • Conduct Mechanical Environments qualification • Conduct Hostile Shock qualification • Conduct Susceptibility Test • Conduct Cumulative Effects Test (Radiated Susceptibility and Thermal Cycle plus mechanical & electrical tests) • Conduct Mass Properties testing for Trainers • Conduct Handling Environment testing for Trainers • Conduct Accumulated Damage Testing on the Storage Environment for Trainers • Conduct Shock/Vibe testing in the transportation environment for Trainers • Further develop analytical, information technology, and data management capabilities. ***FY 2023 Plans:*** • Analyze Flight Test Unit 3 data and author Flight Test Unit 3 Test Report • Conduct Ground Test Unit 4 Integrated Test Bed Test • Conduct Radiation Test Qualification • Analyze and report Ground Test Unit 4 test results • Release Qualification Evaluation for Arming and Fuzing Assembly testers (PT3800 and PT3945) • Complete Weapons Effects Test Lab Process-Prove-In unit destructive testing and assessment • Complete final reports for qualification tests conducted in FY2022 • Update Arming and Fuzing Assembly requirement verification to include Arming and Fuzing Assembly qualification test results • Complete developmental requirements for major components • Complete Arming and Fuzing Assembly Production Readiness Review • Prepare for Full Rate Production Milestone • Further develop analytical, information technology, and data management capabilities. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreased due to ramp down of development efforts and initiation of production efforts.			
Title: Weapon System Integration/Systems Engineering	17.400	19.532	19.300
Description: Integrate the Mk21 fuze into the Intercontinental Ballistic Missile weapon system. Validate designs through ground tests on an Integrated Test Bed (ITB). Plan and conduct necessary ground and flight testing. Coordinate design, development and test efforts.			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604933F / *ICBM Fuze Modernization*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY 2022 Plans: • Continue Basic Nuclear Safety Assessment Report updates • Continue Nuclear Surety Evaluation Report updates • Continue ICBM Compatibility Certification Report updates • Support Flight Test Unit 3 testing and activities • Validate Technical Order updates • Chair Survivability Task Team (STT) • Perform Comparative Analysis Phase II • Operate & Maintain ITB Fuze System Tester • Support Fuze PESHE update and incorporation into GBSD Programmatic PESHE • Perform update to Fuze Performance Specification • Support Requirements Trace Analysis • Perform Red Team Performance Assessment of SNL Radar ***FY 2023 Plans:*** • Continue Basic Nuclear Safety Assessment Report updates • Continue Nuclear Surety Evaluation Report updates • Continue ICBM Compatibility Certification Report updates • Support Flight Test Unit 3 data analysis and reporting • Support Ground Test Unit 4 Integrated Test Bed test • Support Ground Test Unit 4 data analysis and reporting • Chair Survivability Task Team (STT) • Perform Comparative Analysis Phase III • Validate Fuze performance against Path Length • Continue various task team support • Initiate USSTRATCOM Survivability Certification • Continue Red Team Performance Assessment of SNL Radar ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreased due to ramp down of development efforts and initiation of production efforts.			
Accomplishments/Planned Programs Subtotals	151.158	129.709	98.376

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604933F / *ICBM Fuze Modernization*

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• MPAF 03 Line Item M30FLH: *ICBM Fuze Mod*	43.450	100.770	137.364	-	137.364	157.889	160.202	115.130	111.581	92.100	918.486
• RDTE 04 PE 0605230F: *Ground Based Strategic Deterrent*	1,397.485	2,553.541	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3,951.026
• RDTE 05 PE 0605238F: *Ground Based Strategic Deterrent EMD*	0.000	0.000	3,614.290	-	3,614.290	3,614.629	3,255.759	3,190.113	2,628.739	4,439.300	20,742.830
• MPAF 01 Line Item MGBSD0: *Ground Based Strategic Deterrent*	0.000	10.895	0.000	-	0.000	610.586	502.720	5,689.931	6,410.554	48,355.610	61,580.296
• RDTE 07 PE 0101328F: *ICBM Reentry Vehicles*	108.625	96.313	118.616	-	118.616	368.449	640.795	698.244	595.010	420.298	3,046.350

Remarks

E. Acquisition Strategy

The ICBM Fuze Modernization program is executing a full cost reimbursable Strategic Partnership Project (SPP) with the NNSA complex using SNL as the design agent and KCNSC as the production agent. The program is a collaborative effort with the USN reducing total program cost and development time by leveraging commonality between the ICBM and Submarine Launched Ballistic Missile fuze components. The USN Mk5 Alt 370 fuze is being developed first, with the USAF Mk21 fuze effort following. Both services participate in all design and development efforts to ensure maximum use of common components, subassemblies and technologies. Both services are using NNSA/SNL to perform fuze design and development. The USAF, as lead systems integrator for the Mk21 fuze, competed a separate weapon system integration contract for integration support to assist the government with MM III unique modifications and fuze integration efforts. Both services are using KCNSC to produce fuzes.

Due to the differences between the Department of Energy and the Department of Defense acquisition processes, the program has decoupled Milestone C from Phase 6.5 and Full Rate Production from Phase 6.6. The program completed a Milestone C decision in October 2021 and is forecasted to complete a Full Rate Production Decision in 2QFY2024.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604933F / *ICBM Fuze Modernization*	**Project (Number/Name)** 655082 / *ICBM FUZE SUPPORT*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Fuze Preliminary Design Development	MIPR	Sandia National Labs : Albuquerque, NM	607.307	65.683	Nov 2020	45.700	Nov 2021	41.611	Nov 2022	-		41.611	36.835	797.136	797.136
Fuze EMD	Various	Various : Various	4.223	6.661	Nov 2020	6.086	Nov 2021	3.664	Nov 2022	-		3.664	3.243	23.877	23.877
Fuze Engineering Change Orders	Various	Various : Various	8.731	3.943	Nov 2020	2.206	Nov 2021	1.528	Nov 2022	-		1.528	1.353	17.761	17.761
Fuze National Security Campus (formerly Kansas City Plant)	MIPR	National Security Campus : Kansas City, MO	193.475	53.936	Nov 2020	51.257	Nov 2021	27.633	Nov 2022	-		27.633	24.461	350.762	350.762
Fuze Weapon System Integration - ICBM Prime	C/CPAF	Northrop Grumman : Clearfield, UT	25.937	-		-		-		-		-	0.000	25.937	25.937
Fuze Weapon System Integration - RS/RV Sub-System Contract (SSC)	C/CPAF	Lockheed Martin : Valley Forge, UT	84.691	-		-		-		-		-	0.000	84.691	84.691
Fuze Weapon System Integration Contract (WSIC)	C/CPFF	Lockheed Martin : Valley Forge, PA	7.650	15.052	Jan 2021	18.700	Jan 2022	18.500	Jan 2023	-		18.500	16.377	76.279	76.279
		Subtotal	932.014	145.275		123.949		92.936		-		92.936	82.269	1,376.443	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Fuze Engineering Support - BAH	C/FP	Booz Allen Hamilton : Clearfield, UT	2.757	-		-		-		-		-	0.000	2.757	2.757
Fuze Engineering Support - BAE	C/FFP	BAE : Clearfield, UT	15.131	2.260	Nov 2020	2.465	Nov 2021	-		-		-	0.000	19.856	19.856
Fuze Engineering Support - ISC	C/TBD	TBD : TBD	0.000	-		-		2.220	Nov 2022	-		2.220	1.965	4.185	4.185
		Subtotal	17.888	2.260		2.465		2.220		-		2.220	1.965	26.798	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604933F / *ICBM Fuze Modernization*	Project (Number/Name) 655082 / *ICBM FUZE SUPPORT*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Fuze Lead Project Office Support	MIPR	AFNWC : Albuquerque, NM	10.480	-		-		-		-		-	0.000	10.480	10.480
Fuze Finite Element Model Validation	C/CPFF	LMTF : Little Mountain, UT	1.843	-		-		-		-		-	0.000	1.843	1.843
Fuze Flight Test Support and Evaluation	Various	Various : Various	10.534	0.135	Jan 2021	-		-		-		-	0.000	10.669	10.669
		Subtotal	22.857	0.135		-		-		-		-	0.000	22.992	N/A

Remarks

The design agent, Sandia National Laboratories (listed as Fuze Preliminary Design Development in the R-3 Development section), is executing the test and evaluation efforts within the main design effort. There are no discretely funded test and evaluation efforts outside of the design agent's activities.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Fuze Cost and Financial Management	C/FFP	Tecelote : Salt Lake City, UT	5.157	-		-		-		-		-	0.000	5.157	5.157
Fuze FFRDC Support	MIPR	Aerospace : Los Angeles, CA	6.903	0.739	Nov 2020	0.780	Nov 2021	0.780	Nov 2022	-		0.780	0.690	9.892	9.892
Fuze Program Support	C/FFP	BAE : Clearfield, UT	1.285	-		-		-		-		-	0.000	1.285	1.285
Fuze Program Management Administration	Various	Various : Various	15.472	2.749	Jul 2021	2.515	Nov 2021	2.440	Nov 2022	-		2.440	2.160	25.336	25.336
		Subtotal	28.817	3.488		3.295		3.220		-		3.220	2.850	41.670	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,001.576	151.158		129.709		98.376		-		98.376	87.084	1,467.903	N/A

Remarks

Prior year RDT&E includes $9.740M in PE 0604222F FY11 and $39.717M in PE 0604851F FY12

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604933F / *ICBM Fuze Modernization*	**Project (Number/Name)** 655082 / *ICBM FUZE SUPPORT*

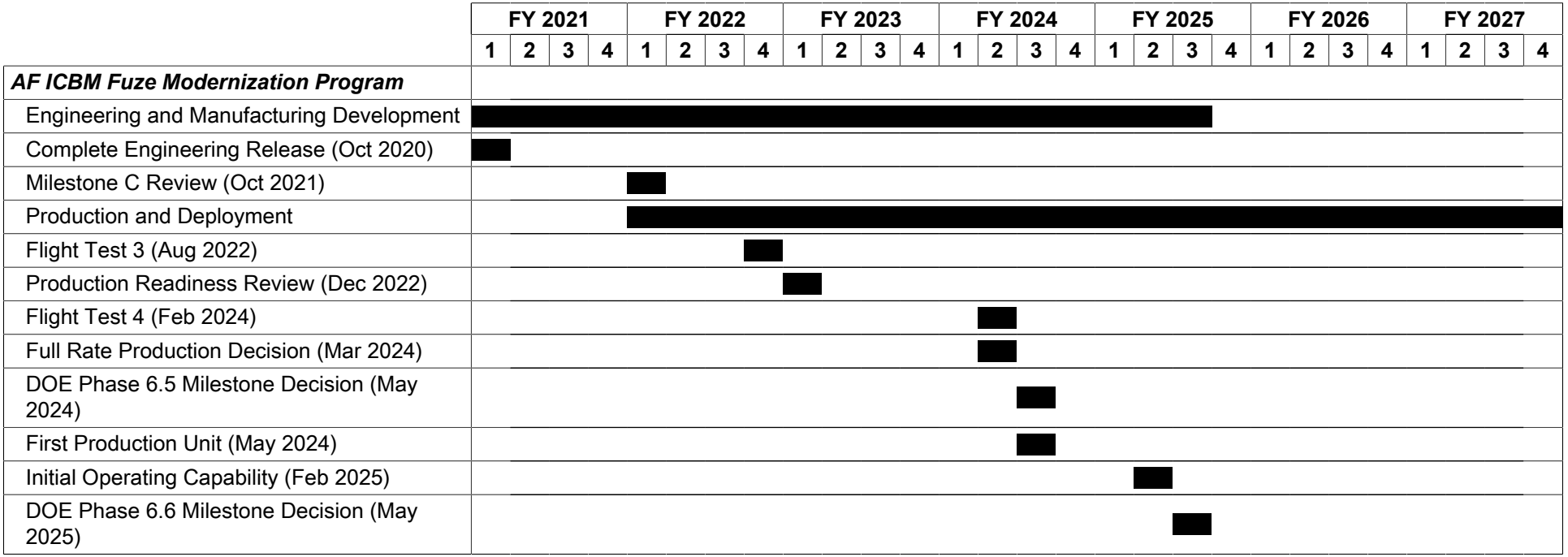

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604933F / *ICBM Fuze Modernization*	**Project (Number/Name)** 655082 / *ICBM FUZE SUPPORT*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
AF ICBM Fuze Modernization Program				
Engineering and Manufacturing Development	1	2021	3	2025
Complete Engineering Release (Oct 2020)	1	2021	1	2021
Milestone C Review (Oct 2021)	1	2022	1	2022
Production and Deployment	1	2022	4	2027
Flight Test 3 (Aug 2022)	4	2022	4	2022
Production Readiness Review (Dec 2022)	1	2023	1	2023
Flight Test 4 (Feb 2024)	2	2024	2	2024
Full Rate Production Decision (Mar 2024)	2	2024	2	2024
DOE Phase 6.5 Milestone Decision (May 2024)	3	2024	3	2024
First Production Unit (May 2024)	3	2024	3	2024
Initial Operating Capability (Feb 2025)	2	2025	2	2025
DOE Phase 6.6 Milestone Decision (May 2025)	3	2025	3	2025

Note

The ICBM Fuze Mod Program discovered the need to de-couple Milestone C and Full Rate Production (FRP) from Phase 6.5 and Phase 6.6 respectively. At the time of the initial baseline in 2014, Phase 6.5 and Phase 6.6 were selected as the surrogates for the DoD milestones. Since that time differences between the DOE Phase 6.x process and the DoD 5000, as it relates to funding of Title 10 programs, drove a de-coupling of these milestones into the Acquisition Program Baseline. This program is still being managed according to the Phase 6.x process but Milestone C and FRP have been added as milestones that will be accomplished to satisfy statutory requirements of a Title 10 funded acquisition.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605030F / *Joint Tactical Network Center (JTNC)*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	2.222	0.000	2.222	8.521	8.680	8.864	9.062	Continuing	Continuing
655068: *Joint Tactical Radio System (JTRS)*	-	0.000	0.000	2.222	0.000	2.222	8.521	8.680	8.864	9.062	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Joint Tactical Networking Center (JTNC) is funded using a Joint budget strategy. Each Military Department (MILDEP) budgets for approximately one-third of the total program RDT&E requirements for joint efforts. Out-year funding is programmed in PE 0605030F by the Air Force, PE 0605030A by the Army and PE 0605030N by the Navy. Prior to submission of the President's Budget, the funding is consolidated in PE 0605030A via Resource Management Decision (RMD) for execution. FY21 through FY23 was programmed to Army PE 0605030A in accordance with the Joint budget strategy. Office of the Secretary of Defense performs the annual RMD in accordance with the JTNC Tri-Military Department Resource Plan, agreed upon by the Services annually.

A. Mission Description and Budget Item Justification

The Joint Tactical Networking Center (JTNC) is chartered to enable the Department of Defense (DoD)'s rapid identification, characterization, procurement, fielding, and sustainment of modular, innovative tactical communications products that ensure secure, interoperable, and resilient Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) capabilities. The JTNC provides technical expertise to facilitate tactical communications management, innovation, and standardization. The JTNC: (1) maintains a cyber-hardened DoD Information Repository (IR), (2) provides Technical Analyses/Capability Characterizations on tactical communications products, (3) provides Open Systems Architecture Standards, (4) exportability analysis and licensing reviews, and (5) serves as Technical Advisor to the Communications, Command, and Control Leadership Board (C3LB) and Tactical Communications Senior Steering Group (TCSSG).

JTNC mission is executed in coordination with key government stakeholders to include: C3LB, TCSSG, Communications Technologies and Waveforms Working Group (CTWWG), the Department of Defense (DoD) Chief Information Officer (CIO), Under Secretary of Defense for Acquisition and Sustainment (USD(A&S)), Joint Staff J6 (JS J6), The Under Secretary of Defense for Research and Engineering, abbreviated USD(R&E), and the Services. Particular attention is paid to ensuring that interagency work is collaborative and eliminates duplicative capability. The JTNC enables a common software baseline that is hardware agnostic leading to increased competition for Software Defined Radios (SDR).

Through collaboration with DoD matrixed and industry partners, the JTNC is engaged in the analysis of directed software and artifacts, and support of the National Security Agency (NSA) Commercial Communications Security (COMSEC) Evaluation Program (CCEP). Additionally, the JTNC participates in Standards-related activities such as the Interface Control Working Group (ICWG), and continues evolving its Capabilities Characterization and Joint Communications Marketplace (CC & JCM) and Modular Radio Architecture (MRA) processes. Further JTNC directed requirements outlined by the C3LB consist of CTWWG, Joint All-Domain Command and Control (JADC2), continued development/maturation of the DoD IR framework and eventual Cloud migration, and JCM Development to meet DoD/Industry requirements in conjunction with DoD Instruction 4630.09.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605030F / *Joint Tactical Network Center (JTNC)*

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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	2.222	0.000	2.222
Total Adjustments	0.000	0.000	2.222	0.000	2.222
• 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	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	2.222	0.000	2.222

Change Summary Explanation

Not a new start program. Zero balance in FY21 - FY23 is attributed to the Resource Management Decision (RMD) to realign Air Force (PE 0605030F) to Army (0605030A) as per the Joint Budget Strategy outlined in the JTNC Tri-Military Department Resource Plan. FY24 and beyond reflects the Air Force one-third share of program funding.

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Joint Tactical Networking Center (JTNC)	0.000	0.000	2.222
Description: Joint Tactical Networking Center (JTNC) aligns with the Communications, Command, and Control Leadership Board (C3LB), DoD Chief Information Officer (CIO), Joint Staff, the Services, and other key stakeholders for those JTNC chartered processes that ensure secure, interoperable, and resilient tactical communications. The JTNC: (1) maintains a cyber-hardened DoD Information Repository (IR), (2) provides Technical Analyses/Capability Characterizations on tactical communications products, (3) provides Open Systems Architecture Standards, (4) exportability analysis and licensing reviews, and (5) serves as Technical Advisor to the JTNC Board of Directors (BoD).			
FY 2022 Plans:			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605030F / *Joint Tactical Network Center (JTNC)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY22 funding realigned to Army PE 0605030A in accordance with Resource Management Decision (RMD) as per the Joint Budget Strategy outlined in the JTNC Tri-Military Department Resource Plan. ***FY 2023 Plans:*** JTNC will continue to serve as Chair of the Communications Waveforms and Technologies Working Group (CTWWG), supporting both TCSSG and C3LB efforts towards managing Joint warfighter challenges and fielding tactical communications solutions. JTNC will continue technical analysis efforts for C3LB approved waveforms, in accordance with Service priorities and the FY 2023 JTNC Management Plan. The JTNC will continue to support both the Services and Principal Staff Assistant (DoD CIO) in oversight of Lead Service activities as Technical Advisor, assisting in the identification and resolution of cross-service networking disconnects. The JTNC will remain engaged in Joint All Domain Command and Control (JADC2) Operational Planning Teams/ systems engineering support across the Services. The JTNC, through the efforts of the CTWWG's Resiliency Sub-Working Group, will coordinate and socialize resiliency terminology, processes, and support resources to design, test, compare, and field tactical radio products most capable of mitigating adversary detection, interception, geolocation, and jamming threats. The JTNC will continue managing and maintaining the DoD Information Repository (IR), providing controlled access for proprietary and nonproprietary waveforms and associated tactical communications products. The JTNC will enhance DoD IR capabilities by evolving framework compliance and Cloud migration. The JTNC will continue Joint Communications Marketplace (JCM) development to meet DoD and Industry requirements in conjunction with DoD Instruction 4630.09. The JTNC will manage evolution of the JCM to provide value-added collaborative environment tools, enabling Government and Industry to share information on innovative technologies and DoD capability gaps leading to rapid acquisition efforts to meet warfighter needs. JCM capabilities/communities will continue to support PEO C3T and Network Cross-Functional Team (N-CFT) requirements for Industry engagement, TEMs, whitepaper submission and evaluation, and follow-on contract efforts. The JTNC will continue development of tactical communications vendor product capability characterizations for commercial off-the-shelf (COTS) and non-developmental item (NDI) tactical communication products. The JTNC will continue to evolve DoD Waveform Standards to facilitate common development, interoperability and re-use, reducing product development time and facilitating faster delivery of capabilities to warfighters. Focused efforts will leverage emerging Spectrum activities and facilitate deployment of the Modular Radio Architecture (MRA). Finally, the JTNC will continue to support export requests and analyses of products for exportability. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Not a new start program. Increase from zero (FY22) to 8.357 (FY23) is a result of the RMD to realign FY22 funding to Army PE 0605030A as per the Joint Budget Strategy outlined in the JTNC Tri-Military Department Resource Plan.			
Accomplishments/Planned Programs Subtotals	0.000	0.000	2.222

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605030F / *Joint Tactical Network Center (JTNC)*

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

The Joint Tactical Networking Center is funded by all the Services. The Joint Funding Strategy requires each of the three Service Military Departments (MILDEPs) to budget for one-third of the total program approved requirement. Other funding is as follows:

Army RDTE: 0605030A, FY 2021 15,671 // FY 2022 16,364 // FY 2023 5,416 // FY 2024 5,768 // FY 2025 5,872 // FY 2026 5,872
Navy RDTE: 0605030N, 3077. FY 2021 0 // FY 2022 0 // FY 2023 5,738 // FY 2024 4,872 // FY 2025 4,992 // FY 2026 5,104

As per the Joint Budget Strategy outlined in the JTNC Tri-Military Department Resource Plan, FY21 and FY22 Air Force PE 0605030F and Navy PE 0605030N have been realigned to Army PE 0605030A for execution via RMD.

E. Acquisition Strategy

The Joint Tactical Networking Center (JTNC) is a Joint support program to the Services, the DoD Chief Information Officer (CIO), the Under Secretary of Defense for Acquisition and Sustainment (USD(A&S)), and USD Research and Engineering (USD(R&E)). JTNC core functions as defined in the JTNC Acquisition Decision Memorandum and Charter signed on 20 January 2014 and revalidated on 13 September 2019 include execution in the following areas: Information Repository, Technical Analysis, Open Systems Architecture Standards, Exportability Analysis and Licensing Review, and Technical Advisor to the C3LB. The services derived from these core functions reinforce an acquisition environment which ensures that interoperable, secure, and resilient joint tactical waveforms and wireless communications applications can operate in a variety of hardware transport solutions.

The FY23 Budget supports continued development/maturation of the DoD IR, analysis of directed software and artifacts, support of the National Security Agency (NSA) Commercial Communications Security (COMSEC) Evaluation Program (CCEP), JTNC Standards Interface Control Working Group (ICWG), the Capabilities Characterization and Joint Communications Marketplace (CC & JCM). The FY23 budget supports the Lead Service Initiative where JTNC will serve as a technical advisor and source of engineering and analytic resources in the conduct of Joint enterprise-level systems engineering and analysis and support DoD CIO. The FY23 budget supports the continued management of Joint warfighter challenges and solutions as assigned by the TCSSG. The FY23 budget supports Modular Radio Architecture (MRA) work, where JTNC will lead development and promulgation of a framework containing a collection of DoD standards and a description or architecture of how to use these to compose or control a communications system. The MRA defines how to implement a communications system or radio on select platforms.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0605030F / *Joint Tactical Network Center (JTNC)*	**Project (Number/Name)** 655068 / *Joint Tactical Radio System (JTRS)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JTNC Engineering/ Technical Support, Test and Evaluation, Product Development Support and Program Management	C/Various	G2SS, NIWC PAC/ LANT, APG : CA	-	0.000	Dec 2020	0.000	Dec 2021	2.222	Oct 2022	-		2.222	Continuing	Continuing	-
		Subtotal	-	0.000		0.000		2.222		-		2.222	Continuing	Continuing	N/A

Remarks

Not a new start program. FY21 & FY22 funding programmed to Army PE 0605030A via RMD as per the Joint Budget Strategy outlined in the JTNC Tri-Military Department Resource Plan.

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.000		0.000		2.222		-		2.222	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0605030F / *Joint Tactical Network Center (JTNC)*	**Project (Number/Name)** 655068 / *Joint Tactical Radio System (JTRS)*

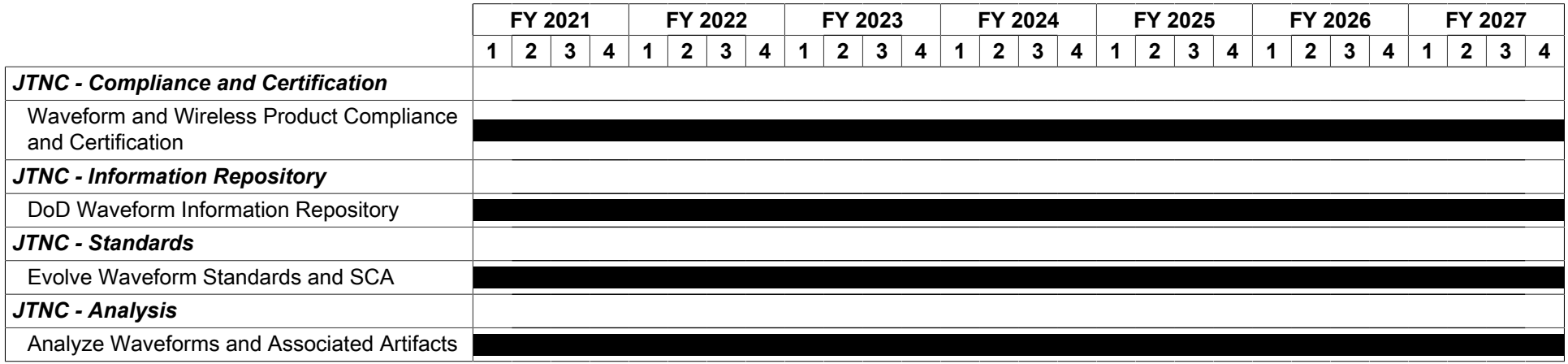

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0605030F / *Joint Tactical Network Center (JTNC)*	**Project (Number/Name)** 655068 / *Joint Tactical Radio System (JTRS)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
JTNC - Compliance and Certification				
Waveform and Wireless Product Compliance and Certification	1	2021	4	2027
JTNC - Information Repository				
DoD Waveform Information Repository	1	2021	4	2027
JTNC - Standards				
Evolve Waveform Standards and SCA	1	2021	4	2027
JTNC - Analysis				
Analyze Waveforms and Associated Artifacts	1	2021	4	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605031F / *Joint Tactical Network (JTN)*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	0.000	0.000	0.000	0.000	0.000	3.509	3.574	3.649	3.730	Continuing	Continuing
655068: *Joint Tactical Radio System (JTRS)**	-	0.000	0.000	0.000	0.000	0.000	3.509	3.574	3.649	3.730	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

*This project's R-2a exhibit has been suppressed due to funding not beginning until after FY 2023

A. Mission Description and Budget Item Justification

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	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

Change Summary Explanation

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs ($ in Millions)

N/A

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605031F / *Joint Tactical Network (JTN)*

E. Acquisition Strategy

N/A

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605056F / *Open Architecture Management*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	29.709	37.109	38.222	0.000	38.222	42.548	43.769	44.567	45.555	Continuing	Continuing
656060: *Standards Management*	-	29.709	37.109	38.222	0.000	38.222	42.548	43.769	44.567	45.555	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Open Architecture Management (OAM) Office (OAMO) at the Air Force Life Cycle Management Center is responsible for developing, evolving, and managing open standards. Open standards permit Department of Defense programs to reduce acquisition and life-cycle costs as well as the risks associated with development, sustainment, technology refresh, and capability upgrades of mission systems on weapon systems. The OAMO continues to manage the Open Mission Systems (OMS) and the Universal Command and Control (C2) Interface (UCI) Standards. Additionally, the OAMO will continue working activities for other standards and open architecture initiatives to transition to OAMO management/ownership.

OAMO provides funding to multiple entities, including the Air Force Research Laboratory (AFRL), the 76th Software Engineering Group (76 SWEG), defense contractors, Federally Funded Research and Development Centers, and University Affiliated Research Centers in support of standards management activities. AFRL is responsible for executing science and technology initiatives to further develop the OMS/UCI Standards. The 76 SWEG is responsible for key activities and deliverables for the OMS and UCI standards including: managing a collaborative tools environment, updating tools in the OMS/UCI Starter Kit, updating the Government critical abstraction layer, maintaining the Reference Implementation, integrating and testing the Mission Package, completing Change Package Development and Sponsorship, supporting the OMS and UCI management activities, providing support to adopting programs, and providing training and associated documentation. These entities will also be funded to support activities for other standards or open architecture initiatives to transition to OAMO management/ownership.

The OAMO will continue development/maintenance of the Government Avionics Reference Architecture (GARA), an architectural framework that includes open architecture standards and Model Based Systems Engineering (MBSE) tools to guide and aid the development or modification of avionics/mission systems.

The OAMO will execute P3I initiatives as required and include activities such as specifically targeted improvements to open standards and open architecture initiatives, coordination with other standardization efforts, enhancements (including cybersecurity, as required), and widening the applicability of the standards the OAMO is involved with.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver open standards capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605056F / *Open Architecture Management*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	30.491	37.109	0.000	0.000	0.000
Current President's Budget	29.709	37.109	38.222	0.000	38.222
Total Adjustments	-0.782	0.000	38.222	0.000	38.222
• 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	0.000	0.000			
• SBIR/STTR Transfer	-0.782	0.000			
• Other Adjustments	0.000	0.000	38.222	0.000	38.222

Change Summary Explanation

FY 2023 increased to standard taxes, inflationary adjustments, etc.

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY 2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Open Architecture Management Office	29.709	37.109	38.222

Description: Accomplish all industry activities that result in the annual release of the OMS and UCI standards along with the associated documentation, including training materials. Manage government activities to support the OMS and UCI Standards. Accomplish industry and government activities to support other open standards and open architecture initiatives managed by the OAMO. Conduct preplanned activities to add additional capability and evolve standards and open architecture initiatives managed and supported by the OAMO.

FY 2022 Plans:

Continue to modify and update the existing OMS and UCI Standards to widen the pool of OMS/UCI applicability, account for emerging technologies, adjust for program specific needs, and conduct targeted training. In coordination with industry partners and government agencies, complete all activities (including quarterly common governance boards) to develop annual releases of the OMS/UCI Standards. Provide government expertise to support open standards and open architecture development efforts. Work activities to advance, modify, or transition to OAMO ownership/management of other open standards and open architecture initiatives, as required. Develop starter kits, tool kits (including required updates), perform testing and integration activities, assist in the generation and maintenance of anti-tamper and cybersecurity documentation, and conduct other management and development activities, as required. Conduct P3I initiatives, such as specifically targeted improvements to the standards in

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605056F / *Open Architecture Management*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
coordination with other standardization efforts. Fund efforts to develop the open architecture initiatives including the Government Avionics Reference Architecture (GARA). Fund Sensor Open Systems Architecture (SOSA) hardware initiatives. ***FY 2023 Plans:*** Continue to modify and update the existing OMS and UCI Standards to increase widen the pool of OMS/UCI applicability, account for emerging technologies, adjust for program specific needs, and conduct targeted training. In coordination with industry partners and government agencies, complete all activities (including quarterly common governance boards) to develop annual releases of the OMS/UCI Standards. Provide government expertise to support open standards and open architecture development efforts. Continue development of GARA. Execute activities to enhance the applicability of open architecture standards OAMO is involved with. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 increase of $1.113 million compare to FY 2022 was due to standard taxes, inflationary adjustment, etc.			
Accomplishments/Planned Programs Subtotals	29.709	37.109	38.222

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

The Air Force Life Cycle Management Center's OAMO awarded a follow-on contract to continue the standards management activities conducted under a previously classified Air Force RDT&E Program Element. The contract is a cost plus fixed fee (CPFF) indefinite delivery/indefinite quantity (ID/IQ) that was awarded in December 2018. The first delivery order has a period of performance of 3 years beginning 1 January 2019. A second delivery order with a one-year period of performance will be awarded in first quarter of FY2021 to cover the period 1 January 2022 through 31 December 2022, period of performance extension 1 January 2023 through 31 December 2023. An acquisition strategy is being worked to continue execution of OAMO requirements/activities once the existing ID/IQ contract ends.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0605056F / *Open Architecture Management*	Project (Number/Name) 656060 / *Standards Management*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Open Architecture Collaborative Working Group - BAE Systems	SS/CPFF	BAE Systems : Nashua, NH	-	0.815	Dec 2020	1.135	Dec 2021	1.100	Dec 2022	-		1.100	Continuing	Continuing	-
Open Architecture Collaborative Working Group - Boeing	SS/CPFF	Boeing : St. Louis, MO	-	3.223	Dec 2020	4.178	Dec 2021	3.150	Dec 2022	-		3.150	Continuing	Continuing	-
Open Architecture Collaborative Working Group - General Atomics ASI	SS/CPFF	General Atomics ASI : Poway, CA	-	1.049	Dec 2020	1.081	Dec 2021	-		-		-	Continuing	Continuing	-
Open Architecture Collaborative Working Group - Collins Aerospace	SS/CPFF	Collins Aerospace : Westford, MA	-	1.236	Dec 2020	1.075	Dec 2021	1.100	Dec 2022	-		1.100	Continuing	Continuing	-
Open Architecture Collaborative Working Group - Harris Corp	SS/CPFF	Harris Corp : Clifton, NJ	-	0.944	Dec 2020	1.254	Dec 2021	-		-		-	Continuing	Continuing	-
Open Architecture Collaborative Working Group - Lockheed Martin	SS/CPFF	Lockheed Martin : Fort Worth, TX	-	4.512	Dec 2020	6.428	Dec 2021	6.192	Dec 2022	-		6.192	Continuing	Continuing	-
Open Architecture Collaborative Working Group - Northrop Grumman	SS/CPFF	Northrop Grumman : Melbourne, FL	-	4.550	Dec 2020	5.239	Dec 2021	7.447	Dec 2022	-		7.447	Continuing	Continuing	-
Open Architecture Collaborative Working Group - Raytheon	SS/CPFF	Raytheon : El Segundo, CA	-	1.792	Dec 2020	1.912	Dec 2021	2.633	Dec 2022	-		2.633	Continuing	Continuing	-
Open Architecture Collaborative Working Group - General Dynamics	C/CPAF	General Dynamics : Reston, VA	-	-		-		1.110	Dec 2022	-		1.110	Continuing	Continuing	-
76th Software Maintenance Group (76 SMXG) Development	PO	76 SWEG : Tinker AFB, OK	-	4.224	Dec 2020	4.506	Dec 2021	4.650	Dec 2022	-		4.650	Continuing	Continuing	-
Air Force Research Laboratory (AFRL)	MIPR	AFRL : Various	-	2.632	Dec 2020	2.334	Dec 2021	2.400	Dec 2022	-		2.400	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0605056F / *Open Architecture Management*	**Project (Number/Name)** 656060 / *Standards Management*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Science and Technology Initiatives															
Engineering Support (1)	MIPR	EPASS Contract: TBD : TBD	-	-		-		-		-		-	Continuing	Continuing	-
Engineering Support (2)	MIPR	MITRE: TBD : TBD	-	1.054	Mar 2021	-		0.427	Dec 2022	-		0.427	Continuing	Continuing	-
Engineering Support (3)	MIPR	MIT-LL : TBD	-	0.247	Mar 2021	0.395	Jan 2022	0.228	Dec 2022	-		0.228	Continuing	Continuing	-
Engineering Support (4)	MIPR	GTRI : TBD	-	0.793	Mar 2021	-		-		-		-	Continuing	Continuing	-
SOSA Initiatives	C/CPFF	Existing IDIQ: TBD : TBD	-	-		2.758	Jan 2022	2.375	Dec 2022	-		2.375	Continuing	Continuing	-
Government Avionics Reference Architecture (GARA)	C/CPAF	GTRI UARC : Atlanta, GA	-	2.442	Jun 2021	4.375	Mar 2022	4.510	Dec 2022	-		4.510	Continuing	Continuing	-
		Subtotal	-	29.513		36.670		37.322		-		37.322	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Administration	Various	OAM Program Office : Wright-Patterson AFB, OH	-	0.196	Jan 2021	0.439	Jan 2022	0.900		-		0.900	Continuing	Continuing	-
		Subtotal	-	0.196		0.439		0.900		-		0.900	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	29.709		37.109		38.222		-		38.222	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0605056F / *Open Architecture Management*	**Project (Number/Name)** 656060 / *Standards Management*

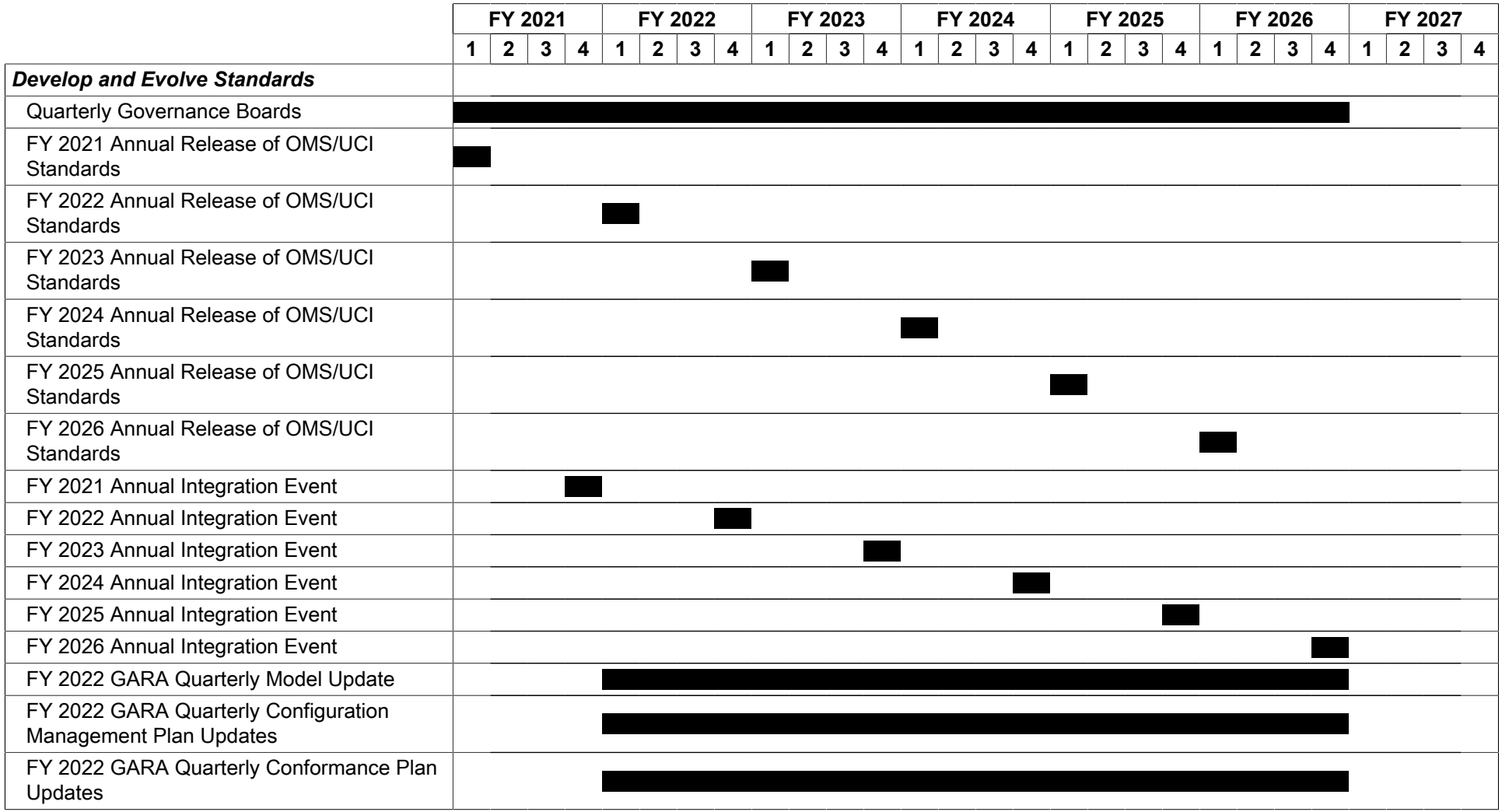

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0605056F / *Open Architecture Management*	**Project (Number/Name)** 656060 / *Standards Management*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Develop and Evolve Standards				
Quarterly Governance Boards	1	2021	4	2026
FY 2021 Annual Release of OMS/UCI Standards	1	2021	1	2021
FY 2022 Annual Release of OMS/UCI Standards	1	2022	1	2022
FY 2023 Annual Release of OMS/UCI Standards	1	2023	1	2023
FY 2024 Annual Release of OMS/UCI Standards	1	2024	1	2024
FY 2025 Annual Release of OMS/UCI Standards	1	2025	1	2025
FY 2026 Annual Release of OMS/UCI Standards	1	2026	1	2026
FY 2021 Annual Integration Event	4	2021	4	2021
FY 2022 Annual Integration Event	4	2022	4	2022
FY 2023 Annual Integration Event	4	2023	4	2023
FY 2024 Annual Integration Event	4	2024	4	2024
FY 2025 Annual Integration Event	4	2025	4	2025
FY 2026 Annual Integration Event	4	2026	4	2026
FY 2022 GARA Quarterly Model Update	1	2022	4	2026
FY 2022 GARA Quarterly Configuration Management Plan Updates	1	2022	4	2026
FY 2022 GARA Quarterly Conformance Plan Updates	1	2022	4	2026

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605223F / *Advanced Pilot Training*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	665.422	216.765	188.898	37.121	0.000	37.121	70.043	61.298	28.430	5.204	20.000	1,293.181
655340: *Advanced Trainer Replacement T-X*	665.422	216.765	188.898	37.121	0.000	37.121	70.043	61.298	28.430	5.204	20.000	1,293.181
Quantity of RDT&E Articles	5	-	-	-	-	-	-	-	-	-		
Program MDAP/MAIS Code: 436												

Note

Prior Years Funding $4.994M was executed in PE 0604233F.

A. Mission Description and Budget Item Justification

The Advanced Pilot Training (APT) program will replace the Air Education Training Command's (AETC) aging T-38C fleet with new aircraft, Ground Based Training System (simulators, training devices, computer based training systems, academics, etc.), Maintenance Training System, and support infrastructure currently used in the fighter/bomber advanced Specialized Undergraduate Pilot Training track as well as in the Introduction to Fighter Fundamentals program. The APT program acquisition strategy was approved by OSD (AT&L) in early FY 2017 (December 2016). At the same time, the APT Team completed their Development Request for Proposal (RFP) Release Defense Acquisition Board and subsequently released the RFP to industry on 30 December 2016. The Program completed source selection evaluations and Milestone B in September 2018 and awarded a Fixed Price Incentive Firm (FPIF) Indefinite Delivery/Indefinite Quantity contract to The Boeing Company on 27 September 2018.

Funding contained in this platform's documentation directly aids AETC flying training enterprise to continue its overall Future Years Defense Program pilot production increase starting in FY 2020, thus reducing the USAF Pilot Shortage.

This requirement supports performance of a full financial audit as required by title 10 U.S.C. Chapter 9A, Sec 240-D

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Advanced Pilot Training 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 FY 2021 $1.068 million was expended for civilian pay expenses in this program element, and in FY 2022 $1.567 million 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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605223F / *Advanced Pilot Training*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	248.216	188.898	0.000	0.000	0.000
Current President's Budget	216.765	188.898	37.121	0.000	37.121
Total Adjustments	-31.451	0.000	37.121	0.000	37.121
• 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	-22.940	0.000			
• SBIR/STTR Transfer	-8.511	0.000			
• Other Adjustments	0.000	0.000	37.121	0.000	37.121

Change Summary Explanation

FY 2021 funding was reduced by a total of $31.451 million which included a $22.940 million reprogramming action for higher Air Force priorities and $8.511 million for Small Business Innovation Research.

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY 2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Advanced Pilot Training (APT) Program	216.765	188.898	37.121
Description: The Advanced Pilot Training (APT) program has an approved acquisition strategy, completed Milestone B, and has progressed into the Engineering and Manufacturing Development (EMD) phase. In FY20, the APT program concluded the Critical Design Review for the Aircraft and Ground Based Training System. This effort includes studies, analysis, acquisition documentation, and market research activities to reduce risk and support the acquisition strategy and engineering and manufacturing development. It also includes Program Support Costs (PSC) such as travel, Other Government Costs (OGC), and Advisory and Assistance Services (A&AS).			
FY 2022 Plans: Program plans to continue developmental test & evaluation, accept delivery of three engineering manufacturing test aircrafts and multiple ground training devices. Plans also include PSC such as travel, OGC's and A&AS.			
FY 2023 Plans:			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605223F / *Advanced Pilot Training*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Program plans to continue developmental test & evaluation, accept delivery of two engineering manufacturing test aircrafts and multiple ground training devices. Plans also include PSC such as travel, OGC's and A&AS. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreased due to a ramp down in engineering and development activities.			
Accomplishments/Planned Programs Subtotals	216.765	188.898	37.121

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• APAF 03 Line Item APT000: *Advanced Trainer Replacement T-X*	0.000	0.000	10.507	-	10.507	321.959	489.174	557.987	892.180	5,276.331	7,548.138
• APAF 06 Line Item APT000: *Advanced Trainer Replacement T-X*	0.000	0.000	0.000	-	0.000	29.330	38.329	38.219	56.126	362.684	524.688
• APAF 07 Line Item 000075: *Other Production Charges*	0.000	0.000	5.160	-	5.160	62.732	72.295	73.835	123.636	21.214	358.872
• OPAF 03 Line Item 837300: *Base Comm Infrastructure*	0.000	0.000	0.700	-	0.700	5.375	5.708	5.438	11.400	0.000	28.621
• OPAF 04 845010: *Base Procured Equipment*	0.300	0.000	0.000	0.000	0.000	3.691	3.161	7.106	3.129	1.000	18.387
• MILCON PE 0804701F: *T-X (Advanced Pilot Trainer) Procurement*	23.400	18.590	4.938	-	4.938	214.529	69.344	38.497	39.570	61.608	470.476

Remarks

Total MILCON Cost Excludes $31.600M of FY20 MILCON funds. MILCON Total Cost=$502.076M

E. Acquisition Strategy

This Advanced Pilot Training (APT) Program will develop, test, acquire, and sustain an affordable, agile, and integrated APT System consisting of 351 aircraft, Ground Based Training System, Maintenance Training System, support, infrastructure, and personnel to meet Air Education and Training Command's initial need date of FY 2024.

The APT program's acquisition strategy leveraged market conditions by competing and awarding development, production, and initial sustainment in a single contract award. The program completed source selection evaluations and Milestone B in September 2018 and awarded a Fixed Price Incentive Firm Indefinite Delivery/Indefinite Quantity contract to The Boeing Company on 27 September 2018 to provide for development, integration, and testing needed to meet existing APT requirements.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605223F / *Advanced Pilot Training*

Additional contract options are available for Low Rate Initial Production, Full Rate Production and initial sustainment transition. The Maintenance Training System will be procured under a separate contractual vehicle.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0605223F / *Advanced Pilot Training*	**Project (Number/Name)** 655340 / *Advanced Trainer Replacement T-X*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Advanced Pilot Training Contracts	Various	Various : TBD	598.896	193.206	Nov 2020	156.035	Nov 2021	0.328	Nov 2022	-		0.328	116.325	1,064.790	1,064.790
		Subtotal	598.896	193.206		156.035		0.328		-		0.328	116.325	1,064.790	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Advanced Pilot Training Mission Support	Various	Various : Various	9.640	5.141	Jun 2021	5.375	Feb 2022	3.549	Feb 2023	-		3.549	3.559	27.264	-
Advanced Pilot Training Direct Cite Authority Civilian Pay	Various	AFLCMC : Dayton, OH	1.319	1.068	Oct 2020	1.567	Oct 2021	1.598	Oct 2022	-		1.598	1.630	7.182	-
		Subtotal	10.959	6.209		6.942		5.147		-		5.147	5.189	34.446	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Advanced Pilot Training Test Support	Various	Edwards AFB : Edwards AFB, CA	20.126	4.815	Jan 2021	10.751	Jan 2022	19.350	Jan 2023	-		19.350	57.973	113.015	-
		Subtotal	20.126	4.815		10.751		19.350		-		19.350	57.973	113.015	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Advanced Pilot Training A&AS	Various	AFLCMC : Dayton, OH	21.286	7.261	Mar 2021	8.234	Mar 2022	7.000	Mar 2023	-		7.000	3.375	47.156	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0605223F / *Advanced Pilot Training*	**Project (Number/Name)** 655340 / *Advanced Trainer Replacement T-X*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Advanced Pilot Training PSC, Other Government Costs	Various	AFLCMC : Dayton, OH	14.155	5.274	Oct 2020	6.936	Oct 2021	5.296	Oct 2022	-		5.296	2.113	33.774	-
		Subtotal	35.441	12.535		15.170		12.296		-		12.296	5.488	80.930	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	665.422	216.765		188.898		37.121		-		37.121	184.975	1,293.181	N/A

Remarks

Prior years amounts under Program 0604233F, Specialized Undergraduate Flight Training.
Advanced Pilot Training Studies and Analysis: $0.935M
Advanced Pilot Training PMA Government Costs: $1.383M
Advanced Pilot Training A&AS: $2.676M

FINANCIAL PERFORMANCE: APT is evaluated against traditional Research and Development (R&D) program expenditure benchmarks. Unlike many traditional R&D programs, however, the APT EMD contract is a FPIF contract with progress payments. Ten 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 health.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0605223F / *Advanced Pilot Training*	**Project (Number/Name)** 655340 / *Advanced Trainer Replacement T-X*

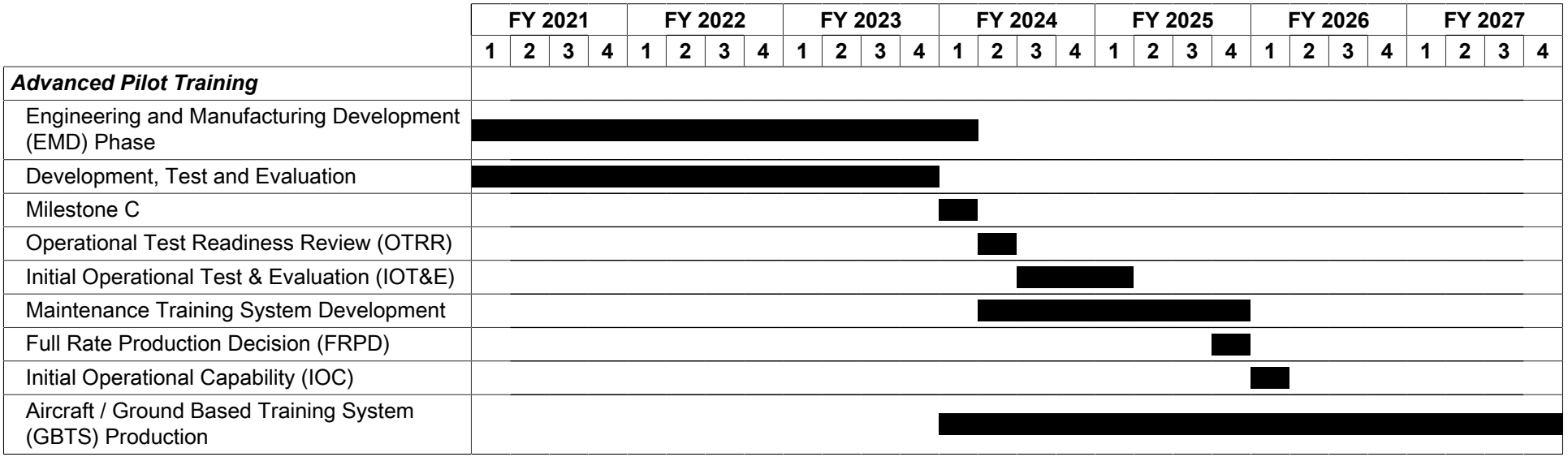

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0605223F / *Advanced Pilot Training*	**Project (Number/Name)** 655340 / *Advanced Trainer Replacement T-X*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Advanced Pilot Training				
Engineering and Manufacturing Development (EMD) Phase	1	2021	1	2024
Development, Test and Evaluation	1	2021	4	2023
Milestone C	1	2024	1	2024
Operational Test Readiness Review (OTRR)	2	2024	2	2024
Initial Operational Test & Evaluation (IOT&E)	3	2024	1	2025
Maintenance Training System Development	2	2024	4	2025
Full Rate Production Decision (FRPD)	4	2025	4	2025
Initial Operational Capability (IOC)	1	2026	1	2026
Aircraft / Ground Based Training System (GBTS) Production	1	2024	4	2027

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605229F / *HH-60W*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	1,897.160	32.196	62.255	58.974	0.000	58.974	26.368	30.973	2.189	2.238	339.830	2,452.183
654364: *Combat Rescue Helicopter*	1,897.160	32.196	62.255	58.974	0.000	58.974	26.368	30.973	2.189	2.238	339.830	2,452.183
Quantity of RDT&E Articles	10	-	-	-	-	-	-	-	-	-		
Program MDAP/MAIS Code: 479												

A. Mission Description and Budget Item Justification

The HH-60W program will replace the aging HH-60G. The HH-60G currently supports the Air Force's core function of Personnel Recovery. The primary mission of the HH-60G is to conduct day / night / marginal weather Combat Search and Rescue (CSAR) in order to recover downed aircrew or other isolated personnel in hostile or non-permissive environments.

The HH-60W will be capable of employment day or night, in adverse weather, and across the full spectrum of threats to include chemical, biological, radiological, and nuclear. On-board defensive capabilities will permit the HH-60W system to operate with less risk than legacy systems in an increased threat environment. An in-flight air refueling capability will provide an airborne alert capability and extend its combat mission range. The HH-60W system is capable of conducting combat search and rescue airborne mission commander duties. The aircraft will be self-supporting to the maximum extent practical. The HH-60W system may also conduct other collateral missions inherent in their capabilities to conduct Personnel Recovery, such as non-conventional assisted recovery, non-conventional evacuation operations, defense support to civil authorities, civil search and rescue, international aid, emergency aeromedical evacuation, disaster/humanitarian relief, counterdrug activities, support for National Aeronautics and Space Administration flight operations, and insertion/extraction of combat forces.

The HH-60W development program will procure a total of ten aircraft as follows: four Engineering, Manufacturing, and Development (EMD) aircraft, five System Demonstration Test Article (SDTA) aircraft, and one modernization flight test aircraft. The FY20 PB added the modernization flight test aircraft. The HH-60W program office will procure necessary ground and flight assets required for both Development Test (DT) and Initial Operational Test & Evaluation (IOT&E). The HH-60W EMD program includes development of the complete HH-60W training system to include HH-60W Weapon System Trainer (WST), Operational Flight Trainer (OFT), Airframe Systems Trainer (AST), Avionics Desktop Trainer (AVDTT), other training devices, with associated spares and support equipment, as well as Type 1 training and courseware required to perform flight, aircrew and maintenance training. Other development efforts include a systems integration laboratory, an avionics integration support facility, procurement of data rights and licenses, spares, SDTA aircraft, Government test, and product support. The HH-60W program will also pursue modernization efforts to develop and integrate enhancements in mission/defensive systems and additional system upgrades to address critical capability gaps. The program office will utilize the additional flight test aircraft in support of modernization efforts to address emerging threats and evolving mission needs.

The Delta Training Device (DTD) effort will procure additional training assets, including but not limited to, maintenance and aircrew Crew Chief Part Task Trainers (CCPTT), aircrew Hoist Procedural Trainers (HPT), Virtual Reality (VR)/Mixed Reality (MR) maintenance aircrew trainers, associated spares and support equipment, as well as Type 1 training.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605229F / *HH-60W*

Capability upgrades and modernization development efforts for the HH-60W may include, but are not limited to, the following priorities: Situational Awareness Data Link/ Automatic Direction Finder Removal (SADL/ADF), Directional Infrared Countermeasures (DIRCM), Electro Optical/Infrared Tactical Overlay (EO/IR), Global Positioning System Anti-Jam/Anti-Spoof, Degraded Visual Environment system, Integrated Vehicle Health Monitoring System Control, Video Data Link, Radio Frequency Jammer, Mobile User Objective System (MUOS), Electronic Flight Bags, and Automated Dependent Surveillance Broadcast - In Device. Capability upgrades and modernization also supports inclusion for mandates, system enhancements, hardware and software changes for diminishing manufacturing sources and Deficiency Report Resolutions. In addition, studies, development, prototyping, testing and integration of emerging technology and support equipment opportunities to increase the effectiveness of the platform are considered in capability upgrades and modernization initiatives.

The HH-60W program funding also supports innovation activities to include studies, analyses, requirements definition, and quick-reaction capability prototypes/ demonstrations to accelerate planning for technology transition, technology insertion and future acquisition programs.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver HH-60W weapon system capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program elements 0605827F, 0605828F, 0605829F, 0605831F, 0605832F, 0605833F, 0605898F, 0606398F. In FY 2021 $0.000 million was expended for civilian pay expenses in this program element, and in FY 2022 $4.500 million is forecasted for civilian pay expenses in this program element.

This requirement supports performance of a full financial audit as required by title 10 U.S.C. Chapter 9A, Sec 240-D.

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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	63.054	66.355	0.000	0.000	0.000
Current President's Budget	32.196	62.255	58.974	0.000	58.974
Total Adjustments	-30.858	-4.100	58.974	0.000	58.974
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-4.100			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-30.004	0.000			
• SBIR/STTR Transfer	-0.854	0.000			
• Other Adjustments	0.000	0.000	58.974	0.000	58.974

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605229F / *HH-60W*

Change Summary Explanation

FY 2021 funding was reduced by a total of $30.858 million which included a $30.004 reprogramming action for higher Air Force priorities and $0.854 million for Small Business Innovation Research.

FY 2022 funding was reduced by $4.100 million due to a Congressional Directed Reduction for contract award delays.

The FY 2022 President's Budget submittal did not reflect FY2023 through FY2026 funding. Therefore, an explanation of the change between two budget positions for FY2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: HH-60W Development	6.537	19.628	12.096	0.000	12.096
Description: Develop a new helicopter, associated training system and support elements that leverage fielded, non-developmental technologies to recapitalize the HH-60G fleet. ***FY 2022 Plans:*** Continue development efforts on HH-60W aircraft, training systems, modernization and associated product support, including developing and integrating mission/defensive systems to address capability gaps. Continue conducting required testing. Continue pre-operational support, training, maintenance support, facilities support, and integration. Continue studies, analysis and training courses. The EMD program is scheduled to wind down with emphasis on deficiency resolution and support of IOT&E. ***FY 2023 Base Plans:*** Continue tactical cross domain solutions to include but not limited to developing and integrating mission/ defensive systems and conduct required testing, training and integration and engineering and product support data analysis efforts. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreased due to ramp down of modern air combat environment simulator and primary developmental efforts.					
Title: HH-60W Government Test and Evaluation	2.995	3.900	4.000	0.000	4.000
Description: Conduct test and evaluation on the HH-60W and associated training systems to support DT&E, IOT&E, Live Fire Test and Evaluation (LFT&E), and other test planning and organizational support.					

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605229F / *HH-60W*	

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
FY 2022 Plans: Test and evaluate mission/defensive systems. Complete aircraft IOT&E. Continue DT&E and IOT&E for Capability Upgrades program. ***FY 2023 Base Plans:*** Continue developmental and operational test for Capability Upgrades program. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increased due to start of developmental test efforts on Capability Upgrades and additional IOT&E efforts.					
Title: Capability Upgrades & Modernization ***Description:*** Modernize the HH-60W fleet by studying, prototyping, testing and integrating developmental and non-developmental technologies into the platform. ***FY 2022 Plans:*** Award an agile, flexible contract solution to efficiently modernize the HH-60W fleet. Continue modernization efforts based on user prioritized capabilities, mandates, diminishing manufacturing sources and material shortages, Deficiency Report Resolutions, Operational Flight Programs, studies, prototyping testing and integration of emerging technologies, carry-on equipment, EO/IR, DIRCM capabilities and support equipment opportunities. ***FY 2023 Base Plans:*** Continue modernization efforts to include prioritized capabilities, mandates, diminishing manufacturing sources and material shortages, Deficiency Report Resolutions, Operational Flight Programs, studies, prototyping testing and integration of emerging technologies, carry-on equipment, EO/IR, DIRCM capabilities and support equipment opportunities ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:***	22.664	38.727	42.878	0.000	42.878

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605229F / *HH-60W*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Funding increased due to ramp up of capability upgrades and modernization efforts, including but not limited to support for mandates, system enhancements, hardware and software changes, and deficiency resolution.					
Accomplishments/Planned Programs Subtotals	32.196	62.255	58.974	0.000	58.974

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• MILCON Line Item 0207229F: *Combat Rescue Helicopter*	4.049	0.000	8.300	-	8.300	0.000	0.000	0.000	-	0.000	12.349
• APAF 04 Line Item H060WH: *Combat Rescue Helicopter*	938.309	743.921	707.018	-	707.018	310.920	42.095	0.000	0.000	0.000	2,742.263
• APAF 06 Line Item H060WH: *Combat Rescue Helicopter*	90.494	76.937	159.691	-	159.691	0.000	0.000	0.000	117.136	0.000	444.258
• APAF 05 H060WH: *HH-60W Combat Rescue Helicopter*	0.000	0.000	3.083	-	3.083	103.475	107.818	102.692	104.915	0.000	421.983

Remarks

E. Acquisition Strategy

Procure a new helicopter and associated training systems, and support elements that leverage fielded non-developmental technologies to recapitalize the HH-60G fleet.

Under the development effort, the HH-60W program will procure a total of ten aircraft as follows: four Engineering, Manufacturing, and Development (EMD) aircraft, five System Demonstration Test Article (SDTA) aircraft, and one modernization flight test aircraft. The FY20 PB added the modernization flight test aircraft. The HH-60W program office will procure necessary ground and flight assets required for both Development Test (DT) and Initial Operational Test & Evaluation (IOT&E).

The main HH-60W program includes development of the complete HH-60W system to include delivery of ten aircraft, associated training systems to include WST, OFT, AVDTT, AST, other Part Task Trainers, associated spares and support elements/equipment, as well as Type 1 training and courseware required to perform flight, aircrew and maintenance training. An additional prime contract was awarded to develop and acquire additional training devices. Other efforts include, but are not limited to development of a systems integration laboratory and an avionics integration support facility, as well as procurement of data rights and licenses, spares, SDTA and product support for the EMD effort. The HH-60W modernization effort will maximize, where possible, opportunities for production line cut-in to minimize the amount of future post-production modifications needed.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605229F / *HH-60W*

The current contract types for this effort are predominantly Fixed Price. As originally planned following source selection, a formal HH-60W Training System Requirements Analysis (TSRA) was completed in Sep 2015. This analysis identified additional training requirements not accounted for in the original contract. These additional training devices, associated spares, support equipment, Type 1 Training and initial contractor support were competitively awarded in Aug 18.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0605229F / *HH-60W*	Project (Number/Name) 654364 / *Combat Rescue Helicopter*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
HH-60W aircraft development, integration, test articles, trainers, support and contractor test	C/FPIF	Sikorsky Aircraft Corporation : Stratford, CT	1,692.101	0.716	Jan 2021	6.594	May 2022	4.463	Jan 2023	-		4.463	2.016	1,705.890	-
Acquisition of additional HH-60W training devices	C/FFP	Various : TBD	30.812	2.810	Jan 2022	5.100	May 2022	0.000	Mar 2023	-		0.000	0.000	38.722	-
HH-60W Capability Upgrades and Modernization- DO1	C/FPIF	Sikorsky Aircraft Corp : Stratford, CT	34.384	22.664	Apr 2021	38.727	May 2022	42.878	Jan 2023	-		42.878	130.857	269.510	-
		Subtotal	1,757.297	26.190		50.421		47.341		-		47.341	132.873	2,014.122	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
HH-60W product support related to aircraft development, integration, test articles, trainers and contractor test	Various	Various : TBD	52.990	2.561	Sep 2021	3.434	Dec 2022	3.133	Jan 2023	-		3.133	2.226	64.344	-
Direct Cite Civ Pay	Various	AFLCMC : TBD	0.000	-		4.500	May 2022	4.500	Oct 2022	-		4.500	10.500	19.500	-
		Subtotal	52.990	2.561		7.934		7.633		-		7.633	12.726	83.844	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
HH-60W planning and testing to support developmental and operational test, live fire test and other weapon system testing and support	PO	413th Test Squadron : Eglin AFB, FL	48.397	2.995	Dec 2021	3.900	Apr 2022	4.000	Dec 2022	-		4.000	8.986	68.278	-
		Subtotal	48.397	2.995		3.900		4.000		-		4.000	8.986	68.278	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0605229F / *HH-60W*	Project (Number/Name) 654364 / *Combat Rescue Helicopter*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
HH-60W A&AS Support	C/CPFF	EPASS : Dayton, OH	28.761	-		-		-		-		-	0.000	28.761	-
HH-60W Other Program Support Costs	Various	Various : Various	9.715	0.450	Sep 2021	-		-		-		-	0.000	10.165	-
		Subtotal	38.476	0.450		-		-		-		-	0.000	38.926	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,897.160	32.196		62.255		58.974		-		58.974	154.585	2,205.170	N/A

Remarks

FINANCIAL PERFORMANCE: HH-60W is evaluated against traditional Research and Development (R&D) program expenditure benchmarks. Unlike many traditional R&D programs, however, the HH-60W EMD contract is primarily a FPIF contract with progress payments. Ten percent of incurred costs are withheld until the end of the contract, when they are liquidated. Mandatory funding obligations, progress payment restrictions and DFAS withholds will cause the program to lag traditional expenditure benchmarks, painting an inaccurate portrait of overall program health.

FY20+: Transitioned Management Services to 3010.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0605229F / *HH-60W*	**Project (Number/Name)** 654364 / *Combat Rescue Helicopter*

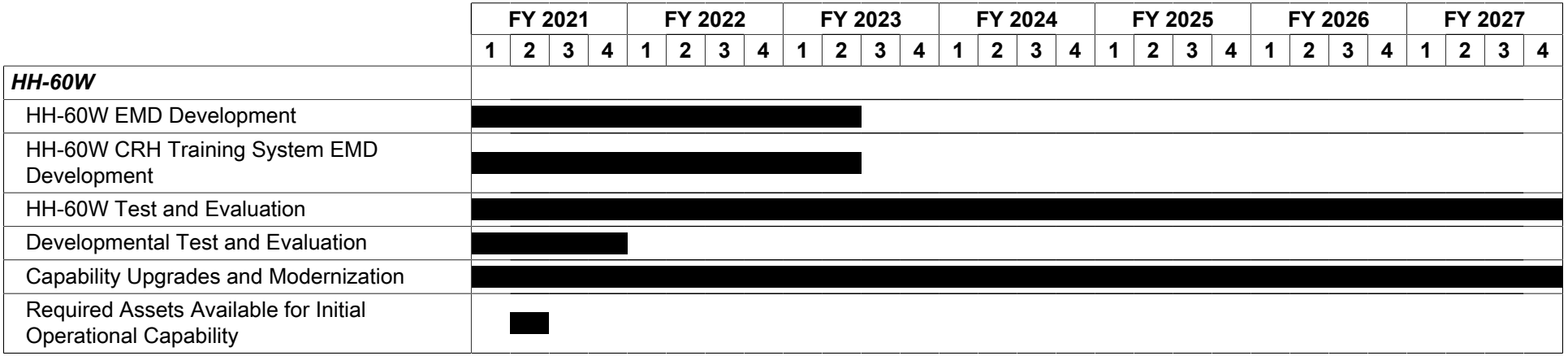

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0605229F / *HH-60W*	**Project (Number/Name)** 654364 / *Combat Rescue Helicopter*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
HH-60W				
HH-60W EMD Development	1	2021	2	2023
HH-60W CRH Training System EMD Development	1	2021	2	2023
HH-60W Test and Evaluation	1	2021	4	2027
Developmental Test and Evaluation	1	2021	4	2021
Capability Upgrades and Modernization	1	2021	4	2027
Required Assets Available for Initial Operational Capability	2	2021	2	2021

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605238F / *Ground Based Strategic Deterrent EMD*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	0.000	0.000	3,614.290	0.000	3,614.290	3,614.629	3,255.759	3,190.113	2,628.739	4,439.300	20,742.830
655238: *GROUND BASED STRATEGIC DETERRENT (GBSD)*	0.000	0.000	0.000	3,614.290	0.000	3,614.290	3,614.629	3,255.759	3,190.113	2,628.739	4,439.300	20,742.830
Quantity of RDT&E Articles	-	-	-	5	-	5	3	6	7	-		
Program MDAP/MAIS Code: 493												

Note

In FY 2023, Program 0605230F, Ground Based Strategic Deterrent, Project 641025, Ground Based Strategic Deterrent, efforts were transferred to Program 0605238F, Ground Based Strategic Deterrent EMD, Project 655238, Ground Based Strategic Deterrent, in order to account for program transition to System Development and demonstration. (Budget Activity 5).

A. Mission Description and Budget Item Justification

The Ground Based Strategic Deterrent (GBSD) program will design, develop, produce and deploy a replacement for the current Minuteman III (MM III) Intercontinental Ballistic Missile (ICBM) weapon system in order to maintain a safe, secure, reliable, and effective nuclear deterrent. The GBSD program will deliver a fully integrated weapon system beginning in Fiscal Year 2029 to lower lifecycle costs and to close key capability gaps and vulnerabilities identified in the GBSD Capabilities Based Assessment, GBSD Capabilities Development Document, and the GBSD Analysis of Alternatives. GBSD will also mitigate ground-based deterrent degradation due to MM III component age-out and attrition.

The GBSD program will include prime contractor development of applicable support equipment, data, flight test hardware and infrastructure, and training systems while examining and mitigating risk during the MM III to GBSD transition. GBSD program office has partnered with MM III program office to facilitate communication and integration of the weapon system recapitalization during the MM III to GBSD transition. This program includes any needed nuclear surety and certification and system vulnerability assessments.

During the Engineering and Manufacturing Development (EMD) phase, the GBSD program will execute 1) government system engineering, analytics, and test capability development; 2) air vehicle equipment development; 3) command & launch systems development; 4) launch systems development; 5) support systems development; and 6) weapon system integration.

Government systems engineering investments include development of model-based systems engineering (MBSE), integration, test software, product life-cycle management framework, and modernization of existing system engineering labs and infrastructure. Air vehicle equipment is an integrated missile stack which includes the propulsion, post-boost, guidance, and re-entry systems sub-components. Command & launch encompasses all command and control components and interfaces, associated ground hardware, ground control equipment and associated software directly related to the survivability, monitoring, and launch of the replacement flight

system. Launch systems include launch centers, launch facilities, and structures and associated ground mechanical systems. Support systems include operator and maintainer training systems hardware and software, security system architecture, transport support equipment, program office and weapon system facilities, and peculiar/common support equipment. Weapon system integration risk reduction includes non-proprietary open systems architecture with well-defined interfaces and a modular design at the weapon system level to allow future modification and technology insertion. As GBSD progresses toward Critical Design Review (CDR), the GBSD weapon system design will dictate the parameters for the MILCON real property requirements and their integration with the weapon system component requirements as these are inextricably linked.

The increase in funding required for Fiscal Year 2023 is to continue executing the EMD contract to advance GBSD major activities to include systems engineering activities, information technology, data management, analytical capabilities and deliver a flexible, integrated weapon system critical design. The program will modify, modernize, and expand the analytic environment and labs to support EMD activities to enable full execution of the program's capability to own the technical baseline throughout the program life cycle. This involves establishing a digital engineering system including a supporting environment / infrastructure to perform digital activities, collaborate with, and communicate across stakeholders. Based on success during the Technology Maturation & Risk Reduction contract, this program will continue to examine and mature air vehicle equipment, command and launch, cybersecurity, operator and maintenance training systems hardware and software, security system architecture, transport sub-systems, Peculiar/Common Support Equipment and associated ground technologies. The program will also continue to mature and refine weapon system and non-operational software, software integration and development, modular system architecture requirements, and product life-cycle management. This will continue to require execution and improvement to the unified certification strategy which meets nuclear surety, cyber security, and nuclear safety requirements. The program will also expand and mature the analytical, information technology, test, and data management capabilities to ensure access to weapon system design information is properly controlled and securely transmitted between government and contractors. The program will continue to develop Vandenberg Space Force Base (SFB) test capabilities and ensure Western Range Test capabilities for the Flight Test Program. Additionally, the GBSD program funds all required developmental and operational test and evaluation activities to meet initial and full operational capability milestones including, but not limited to, developing, improving and modernizing test capabilities essential to reaching those milestones when existing test capabilities are inadequate or non-existent. The program will also continue integrating the requirement for dual-capable, air based, survivable launch capability. Finally, the program will establish a government-owned and government-operated DevSecOps/ software stack.

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 0605833F or 0605831F. In FY2021 $0.000M was expended for civilian pay expenses in this program element, and in FY2022 $0.000M 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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605238F / *Ground Based Strategic Deterrent EMD*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	3,614.290	0.000	3,614.290
Total Adjustments	0.000	0.000	3,614.290	0.000	3,614.290
• 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	3,614.290	0.000	3,614.290

Change Summary Explanation

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY 2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Engineering & Manufacturing Development (EMD) Product Development	-	0.000	3,048.121

Description: The EMD Product Development major thrust captures the planned events and activities of the EMD prime contractor in the design, development and test activities of the weapon system. The EMD Product Development major thrust activities are linked with the corresponding EMD Government Support major thrust activities to ensure the government owns-the-technical baseline for the system acquisition. The objectives are: 1) advance GBSD major activities, systems engineering activities, information technology, data management, analytical capabilities and deliver a flexible, integrated weapon system critical design, 2) prototype and test mature technologies related to the major activities and demonstrate performance of sub-system and system capabilities through prototyping and testing and 3) engage in rapid prototyping events to mature future design increments.

FY 2022 Plans:

N/A

FY 2023 Plans:

• Conduct sixteen sub-system critical design reviews (CDRs) for multiple segments of the weapon system including all three stages of the booster stack, guidance computer, and payload shroud.
• Continue to execute the EMD Contract to advance GBSD major activities to include systems engineering activities, information technology, data management, analytical capabilities and deliver a flexible, integrated weapon system critical design.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605238F / *Ground Based Strategic Deterrent EMD*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
• Continue to examine and mature air vehicle equipment, command and launch, cybersecurity, operator and maintenance training systems hardware and software, security system architecture, transport sub-systems, and associated ground technologies. Refine requirements and modular architectures through trade studies, prototyping, demonstration, and analysis. • Continue to build and refine Mission Modeling Framework (MMF) by incorporating higher-fidelity weapon system designs and updates to threat landscape to facilitate ongoing assessment of weapon system performance against the authoritative threat. • Continue to mature the assessment of the current MM III launch systems to determine, through onsite assessments and analysis, the extent of degradation and evaluate for future upgrade, replacement, preparation, and modernization of operational and test facilities. • Continue to mature the weapon system by conducting trade studies, system engineering, test activities, and system modeling and simulation. • Continue to assess fielding requirements for air vehicle equipment, command & launch, and launch systems and appropriate timelines to transition from MM III to GBSD solution. • Conduct planning for the use of MBSE tools during Operations and Sustainment phase in order to transform ICBM sustainment and supply chain management. • Continue to mature and refine weapon system and non-operational software, software integration and development, modular system architecture requirements, and product life-cycle management. • Continue to further develop analytical, information technology, and data management capabilities. • Continue to implement information systems and information technology design to support EMD execution. • Continue to plan and execute critical software risk reduction activities. • Continue to expand and mature the analytical, information technology, test, and data management capabilities to ensure access to weapon system design information is properly controlled and securely transmitted between government and contractors. • Continue to expand large data ingest capabilities to support consumption of flight test and Model Based Architecture and Software Engineering data. • Continue to execute and improve the unified certification strategy which meets nuclear surety, cyber security, and nuclear safety requirements. • Continue to plan, develop, mature capability integration with the Nuclear Command, Control, and Communications (NC3) Center for future command, control, and communication requirements. • Continue to collaborate with National Nuclear Security Administration to ensure seamless integration of Department of Energy assets into GBSD weapon system. • Continue to integrate the Mk21A Reentry Vehicle (Program 0101328F), ICBM Fuze Modernization (Program 0604933F), and GBSD test programs. • Continue to integrate the requirement for dual-capable, air-based, survivable launch capability. • Continue to develop and test reentry vehicles to meet joint Department of Energy and Department of Defense specific requirements.			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605238F / *Ground Based Strategic Deterrent EMD*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
• Continue to plan, develop, and mature support systems to include Common Support Equipment/Peculiar Support Equipment and all transportation equipment. • Continue to conduct studies and initiatives to build schedule margin, reduce risk in the MM III-to-GBSD transition, and reduce life cycle costs as the program progresses through the EMD phase to the Production phase. • Continue activities necessary to plan, program, and execute weapon system structures needed to support program milestones and test objectives. • RDT&E quantities are built and delivered by the prime contractor to utilize in prototyping and design testing as the prime contractor progresses toward the final design solution and hardware needed for First Flight. • Complete the solid rocket motor development tests (1 per stage). • Complete LF-04 and LF-26 construction and weapon system install. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increased due to continued ramp up of EMD efforts to execute sub-system Critical Design Reviews (CDR) in preparation for System Qualification and Verification Review and initiation of solid rocket motor development testing.			
Title: EMD Government Support	-	0.000	566.169
Description: The EMD Government Support major thrust captures planned events and activities for government agencies, Federally Funded Research and Development Centers (FFRDCs), University Affiliated Research Centers (UARCs), and other partners in the support of the EMD prime contractor efforts in design, development, and test of the weapon system. The EMD Government Support major thrust activities are linked with the corresponding EMD Product Development major thrust activities to ensure the government owns the technical baseline for the system acquisition. The objectives are: 1) advance GBSD major activities, systems engineering activities, information technology, data management, analytical capabilities and deliver a flexible, integrated weapon system critical design, 2) prototype and test mature technologies related to the major activities and demonstrate performance of sub-system and system capabilities through prototyping and testing and 3) engage in rapid prototyping events to mature future design increments. ***FY 2022 Plans:*** N/A ***FY 2023 Plans:*** • Continue to modify, modernize, and expand the analytic environment and labs to support EMD activities to enable full execution of the program's capability to own the technical baseline throughout the program life cycle. This involves establishing a digital engineering system including a supporting environment/infrastructure to perform digital activities, collaborate with, and communicate across stakeholders.			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605238F / *Ground Based Strategic Deterrent EMD*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
• Continue to examine and mature air vehicle equipment, command and launch, cybersecurity, operator and maintenance training systems hardware and software, security system architecture, transport sub-systems, and associated ground technologies. Refine requirements and modular architectures through trade studies, prototyping, demonstration, and analysis. • Continue to assess fielding requirements for air vehicle equipment, command and launch, and launch systems and appropriate timelines to transition from MM III to GBSD solution. • Continue to conduct studies and initiatives to build schedule margin, reduce risk in the Minuteman III-to-GBSD transition, and reduce life cycle costs as the program progresses through the EMD phase to the Production phase. • Continue to mature and refine weapon system and non-operational software, software integration and development, modular system architecture requirements, and product life-cycle management. • Continue to mature the assessment of the current MM III launch systems to determine, through onsite assessments and analysis, the extent of degradation and evaluate for future upgrade, replacement, preparation, and modernization of operational and test facilities. • Continue to execute all government critical path activities to include, but not limited to, Preliminary Draft Environmental Impact Statement (PDEIS), Coordinating Draft Environmental Impact Studies (EIS), Environmental Baseline Surveys, and Section 106 Programmatic Agreement. • Continue to mature the weapon system by conducting trade studies, system engineering, test activities, and system modeling and simulation. • Continue to build and refine MMF by incorporating higher-fidelity weapon system designs and updates to threat landscape to facilitate ongoing assessment of weapon system performance against the authoritative threat. • Continue to expand large data ingest capabilities to support consumption of flight test and Model Based Architecture and Software Engineering data. • Conduct planning for the use of MBSE tools during Operations and Sustainment phase in order to transform ICBM sustainment and supply chain management. • Continue to further develop analytical, information technology, and data management capabilities. • Continue to implement information systems and information technology design to support EMD execution. • Continue to expand and mature the analytical, information technology, test, and data management capabilities to ensure access to weapon system design information is properly controlled and securely transmitted between government and contractors. • Continue to build and establish an industrial base for innovation around the GBSD enterprise to maintain modularity and adaptability for the life cycle of the weapon system. • Continue to plan and execute critical software risk reduction activities. • Continue to expand the Information Systems/Information Technology/Information Assurance infrastructure networks and personnel required to support Top Secret, Special Access Programs, and collateral activities and expand capability at mission partner operating locations and network access points.			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605238F / *Ground Based Strategic Deterrent EMD*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
• Continue to expand government-owned and government-operated DevSecOps/software stack to include data and software artifact transport between classified environments using cross domain solutions. • Continue to refine Security Classification Guide, update impacts, and implement updates and changes through all Government and contractor programmatic activities. • Continue to integrate the Mk-21A Reentry Vehicle (Program 0101328F), ICBM Fuze Modernization (Program 0604933F), and GBSD test programs. • Continue to execute and improve the unified certification strategy which meets nuclear surety, cyber security, and nuclear safety requirements. • Continue to develop a common cryptographic device and supporting equipment for use in multiple subsystems and/or networks throughout the GBSD weapon system. • Continue to plan, develop, and mature capability integration with the NC3 Center for future command, control, and communication requirements. • Continue to increase FFRDC/UARC support to maintain the ability to own the technical baseline in EMD. • Continue to collaborate with National Nuclear Security Administration to ensure seamless integration of Department of Energy (DoE) assets into GBSD weapon system. • Continue to develop test re-entry vehicles to meet joint DoE/DoD specific requirements. • Continue to integrate requirement for dual-capable, air-based, survivable launch capability. • Continue to develop, improve & modernize government test capabilities required for successful Developmental Test (DT) and Operational Test (OT) including but not limited to, Vandenberg SFB test capabilities, Western Range Test capabilities, Broad Ocean Area Terminal Area Scoring Test Capability, and various noise, vibration and harshness and nuclear hardness and survivability test sites/beds as required. Prepare & verify test capabilities' readiness to support the flight test campaign commencing in FY24. Leverage digital engineering tools & physical test data to mature Modeling & Simulation tools toward authoritative virtualization. • Continue activities necessary to plan, program, and execute weapon system structures needed to support program milestones and test objectives. • Continue to plan, develop, and mature support systems to include Common Support Equipment/Peculiar Support Equipment and all transportation equipment. • Continue to modify and expand GBSD workspace at all operating locations to accommodate a growing workforce and provide the tools for the workforce to own the technical baseline. • Complete the solid rocket motor development tests (1 per stage). • Complete LF-04 and LF-26 construction and weapon system install.			
FY 2022 to FY 2023 Increase/Decrease Statement:			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605238F / *Ground Based Strategic Deterrent EMD*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Funding increased due to continued ramp up of EMD efforts to execute sub-system Critical Design Reviews (CDR) in preparation for System Qualification and Verification Review and initiation of solid rocket motor development testing.			
Accomplishments/Planned Programs Subtotals	-	0.000	3,614.290

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• RDTE 04 PE 0605230F: *Ground Based Strategic Deterrent*	1,397.485	2,553.541	-	-	-	-	-	-	-	0.000	3,951.026
• RDTE 04 PE 0603851F: *Intercontinental Ballistic Missile - Dem/Val*	34.755	49.621	46.432	-	46.432	16.717	28.424	7.821	7.995	Continuing	Continuing
• MPAF 01 Line Item MGBSD0: *Ground Based Strategic Deterrent*	0.000	10.895	0.000	-	0.000	610.586	502.720	5,689.931	6,410.554	48,355.610	61,580.296
• MILCON PE 0101233F: *GBSD SQUADRONS*	89.200	168.099	434.000	-	434.000	218.152	301.547	694.984	709.093	6,078.493	8,693.568
• O&M PE 0101233F: *GBSD SQUADRONS*	3.404	20.001	40.915	-	40.915	51.351	90.363	42.767	64.843	0.000	313.644
• OPAF 03 WSC 834130: *AF Physical Security System*	0.000	0.000	2.839	-	2.839	0.000	0.000	0.000	0.000	0.000	2.839

Remarks

E. Acquisition Strategy

The objective of the GBSD program strategy is to deliver a full, integrated weapon system capability that meets Air Force Global Strike Command's Capability Development Document requirements beginning in Fiscal Year 2029. For the Engineering and Manufacturing Development (EMD) phase of this strategy, the Program Office awarded an EMD contract in the 4th quarter of Fiscal Year 2020. The objectives of EMD for GBSD are as follows: 1) to deliver low-risk, technologically mature, integrated weapon system baseline design; 2) develop flexible system architecture with options for future on-ramps and off-ramps to mitigate program risks; 3) embrace MBSE/digital engineering to streamline system development activities and timelines; 4) align contract incentives to mitigate schedule and performance risk; 5) utilize MBSE processes and tools to create schedule margin and accelerate surety, safety, cyber, and test activities for time certain delivery; 6) ensure government owns key interfaces and data rights; and 7) pursue "smart commonality" with Navy, Space, and Missile Defense Agency. The EMD phase includes an EMD Baseline Review, Critical Design Review, First Flight Test, Full Functional System Test, System Qualification/System Verification Review, Nuclear Certification, Developmental Test, Operational Test, and culminates with early production and weapon system deployment. The program will also assess the cost and schedule risks associated with every requirement. The EMD contract includes 5 options for early production and deployment. The period of performance, to include the production and deployment options,

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
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is fourth quarter of Fiscal Year 2020 to the second quarter of Fiscal Year 2028. These efforts will ultimately extend the capabilities of the ground-based leg of the nuclear triad through 2075.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0605238F / *Ground Based Strategic Deterrent EMD*	**Project (Number/Name)** 655238 / *GROUND BASED STRATEGIC DETERRENT (GBSD)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GBSD EMD Contract	C/CPIF	Northrop Grumman Sys Corp : El Segundo, CA	0.000	-		-		3,048.121	Oct 2022	-		3,048.121	6,906.121	9,954.242	13,293.563
		Subtotal	0.000	-		-		3,048.121		-		3,048.121	6,906.121	9,954.242	N/A

Remarks

Prior to Fiscal Year 2023, funding for these efforts was included under Program 0605230F, Ground Based Strategic Deterrent.
GBSD EMD Contract Total Cost is anticipated to be $13,293.563 million. Funding is split between programs 0605230F, Ground Based Strategic Deterrent and 0605238F, Ground Based Strategic Deterrent EMD.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integration Support Contract	C/FFP	TBD : Hill AFB, UT	0.000	-		-		112.700	Oct 2022	-		112.700	570.693	683.393	519.735
Naval Surface Warfare Center Crane Support	MIPR	Naval Surface Warfare Center Crane : Crane, IN	0.000	-		-		7.600	Nov 2022	-		7.600	32.970	40.570	-
Aerospace FFRDC Support	MIPR	Aerospace Corporation : El Segundo, CA	0.000	-		-		24.656	Nov 2022	-		24.656	105.871	130.527	-
MITRE FFRDC Support	MIPR	MITRE : Bedford, MA	0.000	-		-		16.200	Nov 2022	-		16.200	95.000	111.200	-
Carnegie Mellon Software Engineering Institute Support	MIPR	Carnegie Mellon : Pittsburgh, PA	0.000	-		-		2.000	Nov 2022	-		2.000	13.506	15.506	-
Sandia FFRDC Reentry Systems Analysis Support	MIPR	Sandia National Laboratories : Various	0.000	-		-		4.000	Oct 2022	-		4.000	56.839	60.839	-
MIT Lincoln Labs FFRDC Reentry Systems Analysis Support	MIPR	MIT Lincoln Labs : Lexington, MA	0.000	-		-		1.600	Oct 2022	-		1.600	9.410	11.010	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0605238F / *Ground Based Strategic Deterrent EMD*	**Project (Number/Name)** 655238 / *GROUND BASED STRATEGIC DETERRENT (GBSD)*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Operations Research Analyst Support	C/FFP	Tecolote Research : Hill AFB, UT	0.000	-		-		4.020	Oct 2022	-		4.020	23.840	27.860	35.487
Nuclear Surety & Certification Support	MIPR	Various : Various	0.000	-		-		5.300	Nov 2022	-		5.300	22.332	27.632	-
Common Cryptographic Equipment	MIPR	Sandia National Labs : Various	0.000	-		-		4.200	Nov 2022	-		4.200	44.772	48.972	-
Mantech Support	RO	Man Tech International : Herndon, VA	0.000	-		-		12.440	Dec 2022	-		12.440	64.408	76.848	-
GBSD Direct Cite Civilian Pay	Various	US Gov Civilians : Hill AFB, UT	0.000	-		-		50.000	Oct 2022	-		50.000	210.367	260.367	-
NEPA Analysis Support	MIPR	Various : Various	0.000	-		-		3.000	Nov 2022	-		3.000	1.177	4.177	-
Reentry Vehicle Sustainment Support	C/CPAF	Lockheed Martin Corp : Bethesda, MD	0.000	-		-		2.000	Dec 2022	-		2.000	12.444	14.444	-
Sandia Integration Support	MIPR	Sandia National Labs : Various	0.000	-		-		2.000	Jan 2023	-		2.000	0.000	2.000	-
GBSD Facility Execution Support	MIPR	Various : Various	0.000	-		-		2.500	Jan 2023	-		2.500	0.000	2.500	-
Space Dynamics Lab Support	MIPR	USU Space Dynamics Lab : Logan, UT	0.000	-		-		2.000	Nov 2022	-		2.000	0.000	2.000	-
GBSD Enterprise Support	C/Various	Various : Various	0.000	-		-		1.434	Dec 2022	-		1.434	906.329	907.763	-
		Subtotal	0.000	-		-		257.650		-		257.650	2,169.958	2,427.608	N/A

Remarks

Prior year's funding included under Program 0605230F, Ground Based Strategic Deterrent.
GBSD is spearheading the Owning The Technical Baseline (OTTB) approach for system acquisition. This approach utilizes additional support efforts that would typically be performed by a Prime Contractor thus increasing costs within Cost Category Items.
- Integration Support Contractor will be defined upon follow-on contract award 4th Qtr FY22.

In order to improve transparency, cost category items were changed as follows:
- GBSD Electronic Parts Strategy and Commonality renamed as Naval Surface Warfare Center Crane Support.
- GBSD System Engineering and Acquisition Support renamed as Aerospace FFRDC Support.
- GBSD Acquisition Support and System Engineering renamed as MITRE FFRDC Support.
- GBSD Software Engineering Institute renamed as Carnegie Mellon Software Engineering Institute Support.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0605238F / *Ground Based Strategic Deterrent EMD*	**Project (Number/Name)** 655238 / *GROUND BASED STRATEGIC DETERRENT (GBSD)*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
- GBSD Reentry Systems (RS) FFRDC Support and Analysis renamed Sandia FFRDC Reentry Systems Analysis Support. - GBSD RS FFRDC Analysis and Acquisition Intelligence Support renamed MIT Lincoln Labs FFRDC Reentry Systems Analysis Support. - GBSD Surety and Certification Engineering Services renamed Nuclear Surety & Certification Support. - GBSD Administrative Support moved to Management Services Category. - GBSD Technical Design Agent for NC2 Codes/Crypto renamed as Common Cryptographic Equipment. - GBSD Civilian Manpower renamed Civilian Direct Cite Authority Manpower. - RV LM OEM Support renamed as Reentry Vehicle Sustainment Support. New item: Space Dynamics Lab Support															

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Johns Hopkins - Applied Physics Lab Support	MIPR	Johns Hopkins University-Applied Physics Lab : Laurel, MD	0.000	-		-		25.000	Oct 2022	-		25.000	146.390	171.390	-
Arnold Engineering Development Complex - Integrated Test Team	PO	Arnold Engineering Development Complex : Arnold AFB, TN	0.000	-		-		20.340	Oct 2022	-		20.340	219.086	239.426	-
Air Force Operational Test and Evaluation Center - Integrated Test Team	PO	Air Force Operational Test and Evaluation Center : Hill AFB, UT	0.000	-		-		3.500	Oct 2022	-		3.500	199.527	203.027	-
Missile & Intelligence Center - Integrated Threat Analysis and Simulation Environment	MIPR	DIA-Missile and Space Intelligence Center : Redstone Arsenal, AL	0.000	-		-		5.000	Nov 2022	-		5.000	26.259	31.259	-
National Air and Space Intelligence Center - Integrated Threat Analysis and Simulation Environment	MIPR	National Air and Space Intelligence Center : Fairborn, OH	0.000	-		-		1.000	Nov 2022	-		1.000	4.260	5.260	-
30th Space Wing Base Support	Various	Various : Various	0.000	-		-		0.760	Dec 2022	-		0.760	0.000	0.760	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0605238F / *Ground Based Strategic Deterrent EMD*	**Project (Number/Name)** 655238 / *GROUND BASED STRATEGIC DETERRENT (GBSD)*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
309th SMXG Software Engineering Support	PO	309th / 517th SWEG : Hill AFB, UT	0.000	-		-		29.282	Oct 2022	-		29.282	275.890	305.172	-
309th SMXG Nuclear Safety Cross Check Analysis	PO	309th / 516th SWES : Hill AFB, UT	0.000	-		-		13.500	Oct 2022	-		13.500	74.825	88.325	-
Silo Fly-out Modeling and Simulation	MIPR	Various : Various	0.000	-		-		5.500	Nov 2022	-		5.500	17.264	22.764	-
Rapid Assessment Technology	MIPR	Various : Various	0.000	-		-		5.115	Mar 2023	-		5.115	8.129	13.244	-
Sandia Flight Test Vehicle Development	MIPR	Sandia National Labs : Various	0.000	-		-		16.200	Dec 2022	-		16.200	24.483	40.683	-
Lawrence Livermore Joint Environmental Test Unit	MIPR	Lawrence Livermore Labs : Livermore, CA	0.000	-		-		0.850	Dec 2022	-		0.850	66.337	67.187	-
Naval Surface Warfare Center Corona Support	MIPR	Naval Surface Warfare Center : Corona, CA	0.000	-		-		1.255	Dec 2022	-		1.255	8.402	9.657	-
RAND Study Support	MIPR	RAND Corp : Santa Monica, CA	0.000	-		-		0.665	Jan 2023	-		0.665	0.000	0.665	-
Combined Test Facility Support	MIPR	Various : Various	0.000	-		-		1.500	Nov 2022	-		1.500	0.000	1.500	-
Broad Ocean Area Terminal Area Scoring Test Capability	MIPR	Navy Strat. Sys. Programs : Various	0.000	-		-		52.310	Nov 2022	-		52.310	0.000	52.310	-
GBSD Enterprise Test and Assessments	C/Various	Various : Various	0.000	-		-		0.540	Nov 2022	-		0.540	5,506.729	5,507.269	-
		Subtotal	0.000	-		-		182.317		-		182.317	6,577.581	6,759.898	N/A

Remarks

Prior year's funding included under Program 0605230F, Ground Based Strategic Deterrent.
In order to improve transparency, cost category items were renamed as follows:
- GBSD Cybersecurity, Test, and Evaluation Framework, Codes/Crypto renamed as Johns Hopkins - Applied Physics Lab Support.
- GBSD Integrated Test Team renamed as Arnold Engineering Development Complex - Integrated Test Team.
- GBSD Independent Operational Test Agency renamed to Air Force Operational Test and Evaluation Center - Integrated Test Team.
- GBSD Integrated Threat Analysis and Simulation Environment (ITASE) 1 renamed to Missile & Intelligence Center - Integrated Threat Analysis and Simulation Environment.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0605238F / *Ground Based Strategic Deterrent EMD*	**Project (Number/Name)** 655238 / *GROUND BASED STRATEGIC DETERRENT (GBSD)*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

- GBSD ITASE 2 renamed to National Air and Space Intelligence Center - Integrated Threat Analysis and Simulation Environment.
- GBSD Launch Systems LF-26 (TMRR) renamed to 30th Space Wing Base Support.
- GBSD Software Support renamed to 309th SMXG Software Engineering Support.
- GBSD NSCCA Support renamed to 309th SMXG Nuclear Safety Cross Check Analysis.
- GBSD / Mission Defense Agency Silo Fly-out Modelling / Simulation Development renamed to Silo Fly-out Modeling and Simulation.
- GBSD Rapid Assessment Technology / LS Support renamed to Rapid Assessment Technology.
- GBSD Joint Test Assembly Encryption renamed to Sandia Flight Test Vehicle Development.
- GBSD Joint Environment Test Unit / Joint Test Assembly National Nuclear Security Agency Cost Share renamed to Lawrence Livermore Joint Environmental Test Unit.
- NSWC Corona Support renamed to Naval Surface Warfare Center Corona Support.

New item: Broad Ocean Area Terminal Area Scoring Test Capability

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GBSD Administrative Support	C/FFP	Delta Solutions, Inc. : Colorado Springs, CO	0.000	-		-		0.887	Nov 2022	-		0.887	152.063	152.950	277.170
GBSD Enterprise Process Improvement Support	C/FFP	Booz Allen Hamilton : McLean, VA	0.000	-		-		11.000	Nov 2022	-		11.000	14.130	25.130	-
Hardware, Software, IT Resources	C/Various	Various : Various	0.000	-		-		43.378	Oct 2022	-		43.378	64.960	108.338	-
GBSD DevSecOps, Software Factory, Cloud, & Infrastructure	Various	Various : Various	0.000	-		-		57.947	Nov 2022	-		57.947	235.537	293.484	-
Operating Location Support	Various	Various : Various	0.000	-		-		7.500		-		7.500	0.000	7.500	-
Enterprise PMA	Various	Various : Various	0.000	-		-		5.490	Oct 2022	-		5.490	217.155	222.645	-
		Subtotal	0.000	-		-		126.202		-		126.202	683.845	810.047	N/A

Remarks

Prior year's funding included under Program 0605230F, Ground Based Strategic Deterrent.

GBSD Integration Support Contract has been incorporated into the Integration Support Contract in the Support Category.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0605238F / *Ground Based Strategic Deterrent EMD*	**Project (Number/Name)** 655238 / *GROUND BASED STRATEGIC DETERRENT (GBSD)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GBSD Electronic Parts Strategy and Commonality has been incorporated into Naval Surface Warfare Center Crane Support in the Support Category.															
GBSD System Engineering and Acquisition Support has been incorporated into the Aerospace FFRDC Support in the Support Category.															
GBSD IS/IT Support renamed to Hardware, Software, IT Resources.															
New item: Operating Location Support															

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	-		-		3,614.290		-		3,614.290	16,337.505	19,951.795	N/A

Remarks

In FY23, GBSD program transitioned from Budget Activity 04 to Budget Activity 05 and EMD efforts transitioned to PE 0605238F, Ground Based Strategic Deterrent EMD, Project 655238, Ground Based Strategic Deterrent from PE 0605230F, Ground Based Strategic Deterrent.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0605238F / *Ground Based Strategic Deterrent EMD*	**Project (Number/Name)** 655238 / *GROUND BASED STRATEGIC DETERRENT (GBSD)*

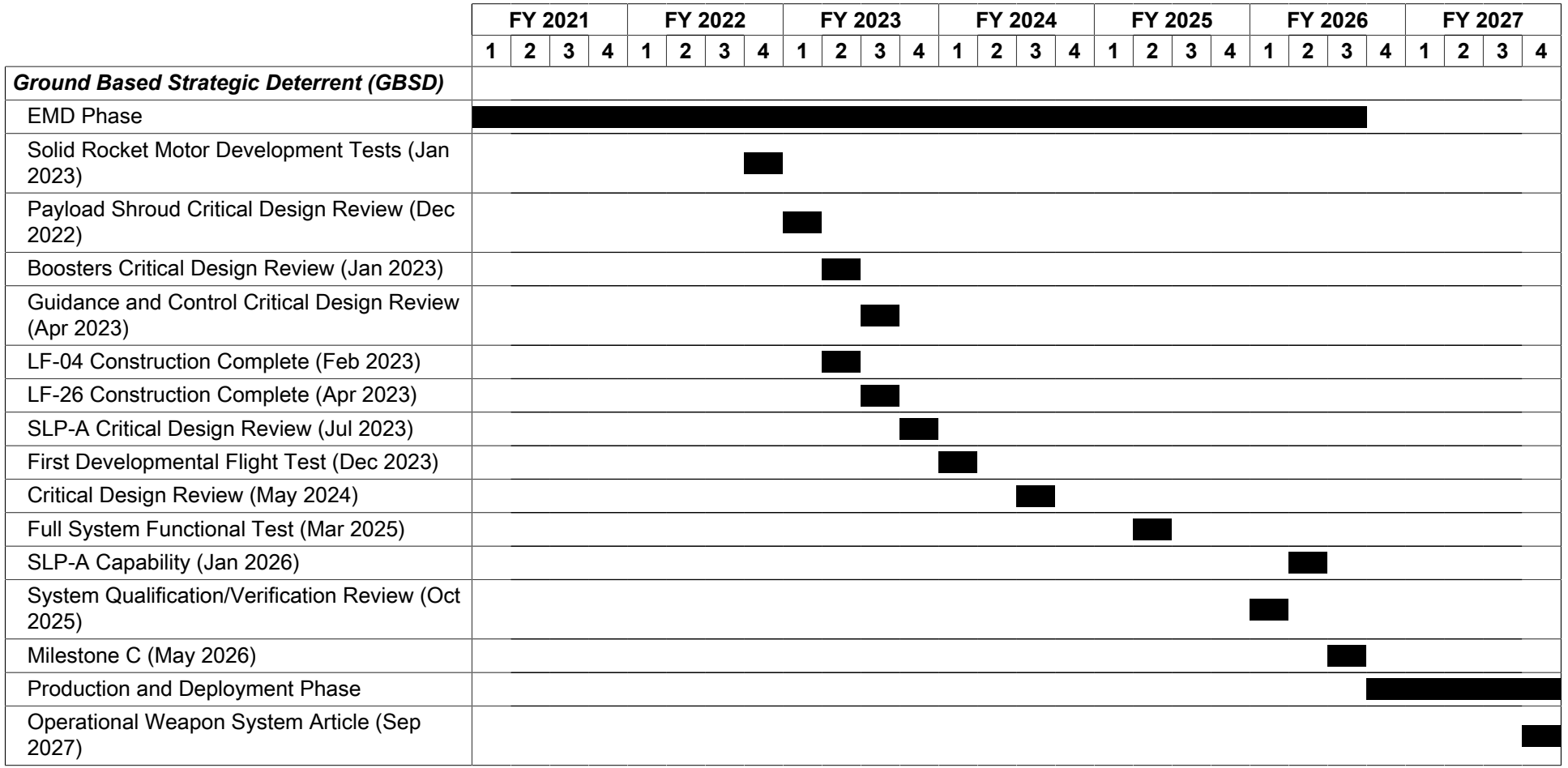

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0605238F / *Ground Based Strategic Deterrent EMD*	**Project (Number/Name)** 655238 / *GROUND BASED STRATEGIC DETERRENT (GBSD)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Ground Based Strategic Deterrent (GBSD)				
EMD Phase	1	2021	3	2026
Solid Rocket Motor Development Tests (Jan 2023)	4	2022	4	2022
Payload Shroud Critical Design Review (Dec 2022)	1	2023	1	2023
Boosters Critical Design Review (Jan 2023)	2	2023	2	2023
Guidance and Control Critical Design Review (Apr 2023)	3	2023	3	2023
LF-04 Construction Complete (Feb 2023)	2	2023	2	2023
LF-26 Construction Complete (Apr 2023)	3	2023	3	2023
SLP-A Critical Design Review (Jul 2023)	4	2023	4	2023
First Developmental Flight Test (Dec 2023)	1	2024	1	2024
Critical Design Review (May 2024)	3	2024	3	2024
Full System Functional Test (Mar 2025)	2	2025	2	2025
SLP-A Capability (Jan 2026)	2	2026	2	2026
System Qualification/Verification Review (Oct 2025)	1	2026	1	2026
Milestone C (May 2026)	3	2026	3	2026
Production and Deployment Phase	4	2026	4	2027
Operational Weapon System Article (Sep 2027)	4	2027	4	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0101125F / *Nuclear Weapons Modernization*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	710.406	9.595	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	720.001
657007: *B61 LIFE EXTENSION PROGRAM*	710.406	9.595	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	720.001
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Program MDAP/MAIS Code: 468												

A. Mission Description and Budget Item Justification

The purpose of this program element is to conduct and support United States Air Force (USAF) and Joint Department of Defense (DoD) / Department of Energy (DOE) acquisition activities for the modernization of nuclear weapons.

B61-12 Life Extension Program (LEP): The B61-12 LEP will integrate DOE efforts to extend the service life of the warhead with DoD efforts to develop a guided Tail Kit Assembly (TKA) required to maintain current B61 mission characteristics. Programmatic integration of the Air Force-led, joint DoD-DOE program is accomplished through the B61 LEP Project Officers Group (POG) and its subgroups. In accordance with Air Force Materiel Command mission assignment memo (dated 17 Feb 11) and National Nuclear Security Administration (NNSA)-Air Force Nuclear Weapons Center (AFNWC) Memorandum of Understanding (MOU dated 28 Jun 12), the USAF is responsible for development, acquisition and delivery of a guided TKA and All Up Round (AUR) technical integration, system qualification and fielding of the B61-12 variant on multiple platforms.

The TKA is now in full-rate production.

Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortage (DMSMS) issues.

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 0605827F, 0605828F, 0605829F, 0605831F, 0605832F, 0605833F, 0605898F, 0606398F. In FY21 $0M was expended for civilian pay expenses in this program element, and in FY22 $0M 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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0101125F / *Nuclear Weapons Modernization*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	9.665	0.000	0.000	0.000	0.000
Current President's Budget	9.595	0.000	0.000	0.000	0.000
Total Adjustments	-0.070	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	-0.070	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

Change Summary Explanation

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Engineering & Manufacturing Development Contract (B61)	0.000	0.000	0.000
Description: Funding will be used for the prime contract to develop, test, integrate and nuclear certify a guided TKA in support of the B61-12 LEP. ***FY 2022 Plans:*** N/A ***FY 2023 Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A			
Title: AUR Technical Integration (B61)	0.100	0.000	0.000
Description: Funding will be used for all system engineering tasks in support of AUR technical integration, qualification & fielding, including program support to the B61 LEP POG. ***FY 2022 Plans:***			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0101125F / *Nuclear Weapons Modernization*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
N/A ***FY 2023 Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A			
Title: Aircraft Integration (B61) ***Description:*** Funding will be used for B61-12 activities associated with integration on threshold aircraft, including mission planning system upgrades to accommodate the new weapon variant. Also includes activities related to weapon design compatibility with both threshold and objective aircraft. ***FY 2022 Plans:*** N/A ***FY 2023 Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A	9.395	0.000	0.000
Title: Test Support (B61) ***Description:*** Funding will be used for test activities and support for TKA design validation & verification and nuclear certification, as well as B61-12 AUR system qualification (includes design and operational certification activities). ***FY 2022 Plans:*** N/A ***FY 2023 Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A	0.100	0.000	0.000
Accomplishments/Planned Programs Subtotals	9.595	0.000	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0101125F / *Nuclear Weapons Modernization*

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• PAAF 01 354040: *B61*	21.189	2.709	0.000	-	0.000	0.000	-	-	-	0.000	23.898

Remarks

The TKA is now in full-rate production.

E. Acquisition Strategy

The Milestone Decision Authority directed a three-fold competitive acquisition strategy at the 30 April 2012 Materiel Development Decision. 1) A single prime contractor was chosen to develop the B61-12 TKA through Engineering Manufacturing and Development (EMD) using full and open competition. EMD consisted of two phases; 2) the prime contractor to maintain competition at the subcomponent level; and 3) a sole-source contract awarded for production to the EMD contractor.

MS-C in 1QFY19 approved entry into Low Rate Initial Production/Lot 1 and the purchase of both long-lead items and life-of-type buys supporting Lot 2 Advanced Procurement for Full Rate Production.

The MDA approved entry into Full Rate Production on October 19, 2020.

B61-12 AUR integration, qualification and acceptance will be conducted through the joint DoD-DOE/NNSA Phase 6.X process and managed through the B61 LEP POG. Sandia National Laboratory will conduct the TKA/Bomb Assembly (BA) technical integration on behalf of the Air Force.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0101125F / *Nuclear Weapons Modernization*	**Project (Number/Name)** 657007 / *B61 LIFE EXTENSION PROGRAM*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
B61 LEP EMD Contracts	C/CPIF	Boeing : St Charles, MO	325.470	-		-		-		-		-	0.000	325.470	325.470
		Subtotal	325.470	-		-		-		-		-	0.000	325.470	N/A

Remarks

EMD Phase II Period of Performance ended June 2020.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AUR Technical Integration	MIPR	Various : various	72.002	0.100	Apr 2021	-		-		-		-	0.000	72.102	-
Aircraft Integration	MIPR	Various : various	186.090	0.215	Apr 2021	-		-		-		-	0.000	186.305	-
		Subtotal	258.092	0.315		-		-		-		-	0.000	258.407	N/A

Remarks

FY21 AUR Technical Integration and Aircraft Integration cost aligns with program schedule and represents the last year of integration activities.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support for B61 LEP Development	PO	96 TW : Eglin, FL	63.366	0.100	Jun 2021	-		-		-		-	0.000	63.466	-
526.1 Assets	MIPR	Various : Various	8.207	-		-		-		-		-	0.000	8.207	-
		Subtotal	71.573	0.100		-		-		-		-	0.000	71.673	N/A

Remarks

FY21 represents the last year of test activities.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0101125F / *Nuclear Weapons Modernization*	Project (Number/Name) 657007 / *B61 LIFE EXTENSION PROGRAM*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMA	Various	various : various	55.271	9.180	Mar 2021	-		-		-		-	0.000	64.451	-
		Subtotal	55.271	9.180		-		-		-		-	0.000	64.451	N/A

Remarks

FY21 funds support AFNWC Nuclear Surety requirement.

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	710.406	9.595		-		-		-		-	0.000	720.001	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0101125F / *Nuclear Weapons Modernization*	**Project (Number/Name)** 657007 / *B61 LIFE EXTENSION PROGRAM*

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
B61 LIFE EXTENSION PROGRAM																												
Aircraft Integration	[redacted]																											
Production Phase	[redacted]																											

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0101125F / *Nuclear Weapons Modernization*	**Project (Number/Name)** 657007 / *B61 LIFE EXTENSION PROGRAM*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
B61 LIFE EXTENSION PROGRAM				
Aircraft Integration	1	2021	4	2021
Production Phase	1	2021	1	2023

Note

The TKA is now in full-rate production.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0207171F / *F-15 EPAWSS*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	849.540	165.691	112.012	67.956	0.000	67.956	13.950	0.000	0.000	0.000	0.000	1,209.149
657108: *EPAWSS DEVELOPMENT*	849.540	165.691	112.012	67.956	0.000	67.956	13.950	0.000	0.000	0.000	0.000	1,209.149
Quantity of RDT&E Articles	6	2	-	-	-	-	-	-	-	-		

Program MDAP/MAIS Code: 485

A. Mission Description and Budget Item Justification

The legacy F-15 Tactical Electronic Warfare System (TEWS) is functionally obsolete. It uses 1970's analog technology to combat 1980s-era radar-based ground and air threats. In addition, this aging system is becoming more difficult and expensive to sustain. As a result, the Air Force is replacing TEWS with the F-15 Eagle Passive/Active Warning and Survivability System (EPAWSS). F-15 EPAWSS is an advanced digital electronic warfare system capable of detecting, identifying, locating, denying, degrading, disrupting, and defeating modern and emerging threat systems in contested airspace with dense radio-frequency (RF) background environments. F-15 EPAWSS will provide indication, type, and position of ground-based RF threats as well as the indication, type, and bearing of airborne threats with the situational awareness needed to avoid, engage, or negate the threat. It will also prevent RF threat systems from detecting or acquiring accurate targeting information to complicate and/or negate an enemy threat targeting solution. Finally, EPAWSS will counter RF and infrared threat systems at end-game via electronic countermeasures (jamming), chaff, and/or flares.

This program element may include necessary emergent or unanticipated civilian pay expenses required to manage, execute, and deliver F-15 EPAWSS 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 0605831F. : In FY2021 $2.066M was expended for civilian pay expenses in this program element, and in FY2022 $2.593M 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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0207171F / *F-15 EPAWSS*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	170.368	112.012	0.000	0.000	0.000
Current President's Budget	165.691	112.012	67.956	0.000	67.956
Total Adjustments	-4.677	0.000	67.956	0.000	67.956
• 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	-4.677	0.000			
• Other Adjustments	0.000	0.000	67.956	0.000	67.956

Change Summary Explanation

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Eagle Passive/Active Warning Survivability System (EPAWSS)	165.691	112.012	67.956
Description: Planned replacement of the existing F-15 Tactical Electronic Warfare System (TEWS).			
FY 2022 Plans: Complete qualification testing of EPAWSS hardware, developmental ground testing, software integration, and test program set development. Continue developmental flight test and logistics support planning efforts, such as development of Maintenance and Flight Tech Pubs. Funds may be used to resolve emerging safety of flight issues, accommodate EPAWSS enhancements, studies facilitating future tech insertion opportunities, and resolve any hardware or software anomalies identified in developmental testing. Additionally, funds may address issues with developmental test aircraft, address required EPAWSS-specific support from other systems on the F-15, and fulfill FAA or other mandates necessary to ensure continued aircrew safety and mission effectiveness.			
FY 2023 Plans: Complete software integration, flight test, cybersecurity verifications, and logistics support planning efforts, such as development of Technical Publications. These efforts enable the program to meet the Acquisition Program Baseline Objective for completion of Initial Operational Test & Evaluation. To that end, funds may be used to address operational effectiveness/suitability/survivability			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0207171F / *F-15 EPAWSS*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
anomalies or enhancements identified in developmental testing; conduct studies related to future modernization and technical insertion opportunities; assess new and emerging threat systems, and/or resolve emerging safety of flight issues. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 decrease due to the majority of development efforts completing in FY22 and prior.			
Accomplishments/Planned Programs Subtotals	165.691	112.012	67.956

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• APAF 05 Line Item F15EWS: *Aircraft Modification*	0.000	149.797	259.837	-	259.837	268.637	318.962	329.085	336.215	0.000	1,662.533
• APAF 07 Line Item 000999: *Aircraft Spares and Repair Parts*	0.000	28.005	19.796	-	19.796	11.206	13.434	27.716	28.316	0.000	128.473
• APAF 07 000075: *OTHER PRODUCTION CHARGES (OVERVIEW)*	15.058	48.823	-	-	-	-	2.022	-	-	0.000	65.903

Remarks

FY 2021 - FY 2027 funding is for F-15E Increment 1 Procurement.

E. Acquisition Strategy

F-15 EPAWSS is using an evolutionary acquisition model consisting of two increments. Increment 1 replaces the existing radar warning receiver, internal countermeasure system and countermeasure dispenser system. Increment 2 adds a towed decoy and monopulse angle countermeasure capability. (Increment 2 is currently an unfunded CDD requirement.) The F-15 EPAWSS technical approach is to leverage mature and proven hardware to field a critically-needed capability as soon as possible. In addition, the program tailored the Milestone C production decision into two decisions: Decision Point #1 (Production Decision, briefed 30 Oct 20 and approved via formal Acquisition Decision Memorandum 1 Dec 20) constituted formal entry into the production phase of the program and initiated procurement of the system hardware items and stand-up of the modification line. Decision Point #2 (Deployment Decision, 2Q CY22) will approve installation of the hardware on operational F-15E aircraft. This tailoring provides the Milestone Decision Authority the ability to accelerate Initial Operational Capability by taking long-lead hardware procurement off the program critical path, reducing the schedule impact of kit lead times.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0207171F / *F-15 EPAWSS*	**Project (Number/Name)** 657108 / *EPAWSS DEVELOPMENT*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	C/CPAF	Not specified. : TBD	0.000	-		-		-		-		-	0.000	0.000	-
F-15 EPAWSS TMRR	SS/ Various	Boeing : St. Louis, MO	233.738	-		-		-		-		-	0.000	233.738	175.860
F-15 EPAWSS EMD	SS/ Various	Boeing : St. Louis, MO	538.020	135.010	Feb 2021	92.487	Nov 2021	62.172	Jan 2023	-		62.172	13.950	841.639	478.786
F-15 EPAWSS	Various	Various : Various	23.596	9.427		6.208		0.000		-		0.000	0.000	39.231	115.854
		Subtotal	795.354	144.437		98.695		62.172		-		62.172	13.950	1,114.608	N/A

Remarks

FY16PB- EPAWSS efforts were transferred from Budget Activity 7, Operational Systems Development, PE 0207171F, Project Number 676038 to Budget Activity 5, Engineering and Manufacturing Development, PE 0207171F, Project Number 657108 per OSD direction.

The final line item reference to "various" contract methods and performing activity/location address other government costs for various EMD-specific hardware, equipment modification/installation/shipping efforts, special studies, travel and support personnel that are required to meet program objectives. The specific execution vehicles vary by effort.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	Various	Not specified. : TBD	46.788	4.892		6.092		3.270		-		3.270	0.000	61.042	-
Government Flight Test	Various	Various : Various	6.201	14.480		6.725		2.514		-		2.514	0.000	29.920	72.735
		Subtotal	52.989	19.372		12.817		5.784		-		5.784	0.000	90.962	N/A

Remarks

The final line item reference to "various" contract methods and performing activity/location addresses other government costs for T&E (both DT&E & IOT&E) specific test equipment/hardware, test event support, test-related special studies, travel and support personnel that are required to meet program objectives. The specific execution vehicles vary by effort.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0207171F / *F-15 EPAWSS*	**Project (Number/Name)** 657108 / *EPAWSS DEVELOPMENT*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Services	C/CPAF	Not specified. : TBD	0.000	-		-		-		-		-	0.000	0.000	-
Program Management Support Costs	Various	Various : Various	1.197	1.882		0.500		0.000		-		0.000	0.000	3.579	44.399
		Subtotal	1.197	1.882		0.500		0.000		-		0.000	0.000	3.579	N/A

Remarks

The final line item reference to "various" contract methods and performing activity/location addresses other government costs for management support of EMD & T&E related activities, creation of special studies documentation, travel, and support personnel that are required to meet program objectives. The execution vehicles vary by effort.

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	849.540	165.691		112.012		67.956		-		67.956	13.950	1,209.149	N/A

Remarks

Prior Years funding in FY 2013 and FY 2014 of $15.100M was executed in PE 0207134F.

Prior Year funding in FY 2015 of $37.726M was executed in PE 0207171F, Project 676038.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0207171F / *F-15 EPAWSS*	**Project (Number/Name)** 657108 / *EPAWSS DEVELOPMENT*

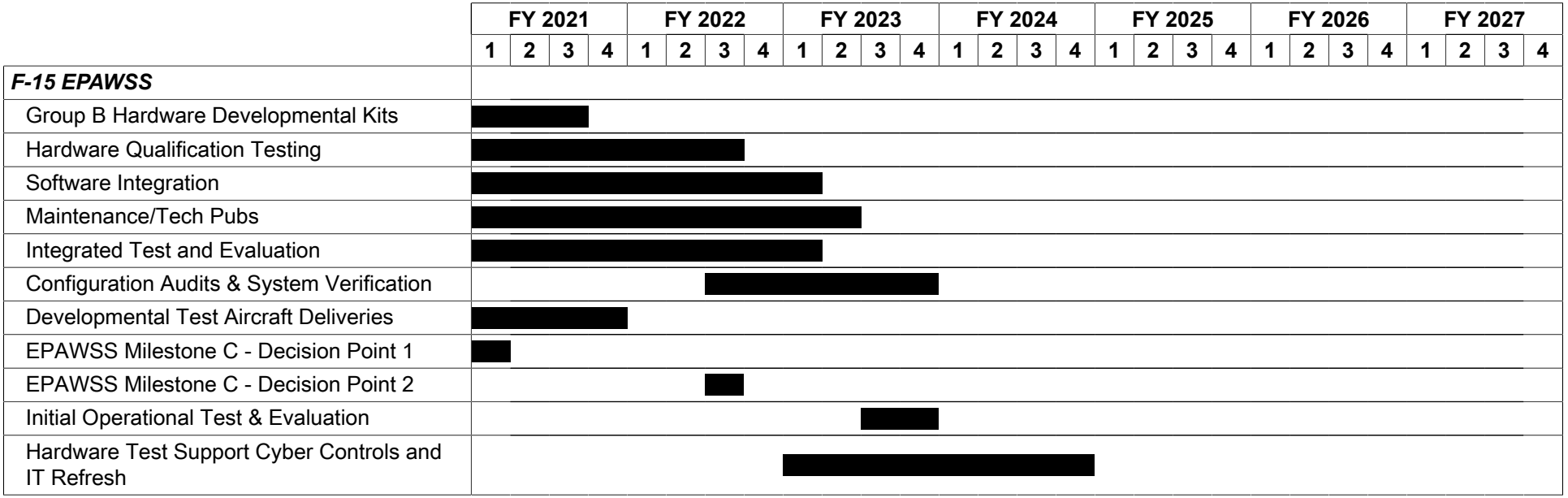

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0207171F / *F-15 EPAWSS*	**Project (Number/Name)** 657108 / *EPAWSS DEVELOPMENT*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
F-15 EPAWSS				
Group B Hardware Developmental Kits	1	2021	3	2021
Hardware Qualification Testing	1	2021	3	2022
Software Integration	1	2021	1	2023
Maintenance/Tech Pubs	1	2021	2	2023
Integrated Test and Evaluation	1	2021	1	2023
Configuration Audits & System Verification	3	2022	4	2023
Developmental Test Aircraft Deliveries	1	2021	4	2021
EPAWSS Milestone C - Decision Point 1	1	2021	1	2021
EPAWSS Milestone C - Decision Point 2	3	2022	3	2022
Initial Operational Test & Evaluation	3	2023	4	2023
Hardware Test Support Cyber Controls and IT Refresh	1	2023	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0207279F / *Isolated Personnel Survivability and Recovery*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	0.000	0.000	27.881	0.000	27.881	56.098	0.000	0.000	0.000	0.000	83.979
654522: *CSAR EMD*	-	0.000	0.000	27.881	0.000	27.881	56.098	0.000	0.000	0.000	0.000	83.979
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 5, PE 0207279F, project 654522, CSEL Next Generation Survival Radio (NGSR), is a new start.

A. Mission Description and Budget Item Justification

Personnel Recovery is the United States Air Force's effort to prepare for and execute recovery and reintegration of isolated personnel. The Combat Survivor Evader Locator (CSEL) System is the US Department of Defense's (DoD) Program of Record for Joint Search and Rescue, to locate, authenticate, and communicate with Joint forces who become Isolated Personnel (IP). The Hand Held Radio (HHR) is the primary communications link for Joint forces who become isolated personnel in contested environments. The HHR provides secure, over-the-horizon, two-way data communications and precise geo-positioning information to rescue forces. It can operate in an anti-access/area denial (A2/AD) environment by providing a low probability of intercept/low probability of detection communications for isolated personnel. The HHR is one segment of the overall CSEL command and control architecture, including the UHF satellite base stations (UBS) and the Joint Personnel Recovery Center web application. The current HHR encryption requires modification to comply with current National Security Agency (NSA) cryptographic standards. The NSA is discontinuing the production and distribution of DES-based cryptographic keying material.

The HHR has significantly diminishing material sources and unsupportable hardware, including reliance on legacy Ultra High Frequency (UHF) satellite communication. UHF capabilities are nearing the end of life, and the CSEL system must move to next-generation secured satellite communication. In concert with the Services and the CSEL Joint Program Office, the Navy conducted a Business Case Analysis. It determined that a recapitalization of the CSEL HHR was more cost-effective than modifying the existing AN/PRQ-7/A. This effort is known as Next Generation Survival Radio (NGSR). The CSEL Joint Program Management Office (JPMO) will execute the NGSR effort in a two-pronged approach:

1. The program will leverage Gov't-owned satellite systems to establish a modern Beyond Line of Sight (BLOS) capability to replace legacy UHF capabilities and ensure encrypted voice and data communication. The BLOS capability should integrate through a cloud based system and SIPRNET for connections. This will culminate with a complete two-way communications path from the IP to the Joint Personnel Recovery Center (JPRC) or recovery activity center.

2. The program office will replace the existing HHR with an Industry-led next-generation survival device. The hand-held device will meet all requirements found in the Operational Requirements Document.

The CSEL JPMO will execute funding to validate and verify Government and Industry-led solutions, minimize risk, and accelerate capability maturation. The JPMO will involve Stakeholders across the Joint Services, National Agencies, and Operational community to meet the intent and maintain the integrity of the Joint Capability. The JPMO will foster a competitive acquisition through Requests For Proposals, including downselect and prototype development opportunities.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0207279F / *Isolated Personnel Survivability and Recovery*

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 0605831F. In FY23 0.000M 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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	27.881	0.000	27.881
Total Adjustments	0.000	0.000	27.881	0.000	27.881
• 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	27.881	0.000	27.881

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: CSEL Next Generation Survival Radio (NGSR)	-	0.000	27.881

Description: The CSEL System is DoD's primary method to locate, authenticate, and communicate with aircrew who become Isolated Personnel. The Hand Held Radio is the only communications link for aircrew who become isolated personnel that provides a secure, over-the-horizon, two-way data communications and precise geo-positioning information to Rescue Forces. It has the ability to operate in an A2AD environment by providing low probability of intercept/low probability of detection communications for isolated personnel.

FY 2022 Plans:
none

FY 2023 Plans:
Begin Beyond Line of Sight (BLOS) development and Prime Product Development, with Cloud integration

FY 2022 to FY 2023 Increase/Decrease Statement:

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0207279F / *Isolated Personnel Survivability and Recovery*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
CSEL NGSR will receive initial funding in FY23			
Accomplishments/Planned Programs Subtotals	-	0.000	27.881

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

CSEL Next Generation Survival Radio will leverage rapid acquisition pathways and contracting vehicles to provide a survival handheld radio to rapidly utilize modernized Beyond Line of Sight capabilities with Cloud-based process and storage capabilities to meet current and future needs of Isolated Personnel. The objective of the acquisition program is to field a prototype that will be demonstrated for a combat environment and provide a residual operational capability within five years of the development of an approved requirement.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0207279F / *Isolated Personnel Survivability and Recovery*	**Project (Number/Name)** 654522 / *CSAR EMD*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prime Mission Product	C/TBD	Not specified. : TBD	-	-		-		13.678	Nov 2022	-		13.678	Continuing	Continuing	-
Sys Eng Prog Mgmt (SEPM)	TBD	Not specified. : TBD	-	-		-		0.054	Nov 2022	-		0.054	Continuing	Continuing	-
BLOS	MIPR	USSF : TBD	-	-		-		7.000	Nov 2022	-		7.000	Continuing	Continuing	-
Engineering Change Order	TBD	Not specified. : TBD	-	-		-		3.449	Nov 2022	-		3.449	Continuing	Continuing	-
		Subtotal	-	-		-		24.181		-		24.181	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Sys Test & Eval	Various	Not specified. : TBD	-	-		-		0.200	Nov 2022	-		0.200	Continuing	Continuing	-
		Subtotal	-	-		-		0.200		-		0.200	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Office Costs	TBD	Not specified. : TBD	-	-		-		3.500	Nov 2022	-		3.500	Continuing	Continuing	-
		Subtotal	-	-		-		3.500		-		3.500	Continuing	Continuing	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		-		27.881		-		27.881	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0207279F / *Isolated Personnel Survivability and Recovery*	**Project (Number/Name)** 654522 / *CSAR EMD*

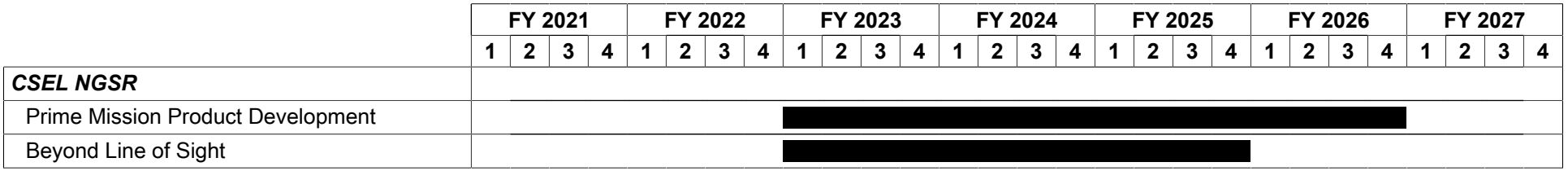

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0207279F / *Isolated Personnel Survivability and Recovery*	**Project (Number/Name)** 654522 / *CSAR EMD*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
CSEL NGSR				
Prime Mission Product Development	1	2023	4	2026
Beyond Line of Sight	1	2023	4	2025

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0207328F / *Stand In Attack Weapon*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	144.362	145.858	166.570	283.152	0.000	283.152	270.228	379.628	718.120	226.800	584.701	2,919.419
653133: *Stand In Attack Weapon*	144.362	145.858	166.570	283.152	0.000	283.152	270.228	379.628	718.120	226.800	584.701	2,919.419
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Stand-in Attack Weapon (SiAW) system will provide the capability to strike rapidly re-locatable targets that create the Anti-Access/Area Denial (A2/AD) environment. SiAW targets include Theater Ballistic Missile Launchers, Land Attack and Anti-Ship Cruise Missile Launchers, GPS Jammers, Anti-Satellite Systems, and Integrated Air Defense Systems. The SiAW missile system will be developed under a Digital Acquisition (DA) approach in a competitive environment that will emphasize agility and innovation. Interim combat capability will be pursued through the Navy's Advanced Anti-Radiation Guided Missile-Extended Range (AARGM-ER) program with improved warhead/fuze and F-35 integration (including Universal Armament Interface [UAI] and Mission Planning).

The total cost of the SiAW Middle Tier of Acquisition Rapid Prototyping effort is 1,126 million, including RDT&E and procurement of prototype units. SiAW is fully funded across the Future Years Defense Program.

This requirement supports performance of a full financial audit as required by title 10 U.S.C. Chapter 9A, Sec 240-D.

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 FY21 4.000M was expended for civilian pay expenses in this program element, and in FY22 4.192M 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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0207328F / *Stand In Attack Weapon*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	150.371	166.570	0.000	0.000	0.000
Current President's Budget	145.858	166.570	283.152	0.000	283.152
Total Adjustments	-4.513	0.000	283.152	0.000	283.152
• 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	-4.513	0.000			
• Other Adjustments	0.000	0.000	283.152	0.000	283.152

Change Summary Explanation

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Warhead / Electronic Safe and Arm Fuze (ESAF) Development / System Engineering / Program Management (SEPM)	64.080	0.000	4.208
Description: Development of a new warhead and ESAF to support AARGM-ER. Will design, test, and certify new warhead/ESAF. ***FY 2022 Plans:*** Continue working with the USN AARGM-ER Program Office on warhead/ESAF development, test, integration, and qualification. This year is funded with FY21 dollars. ***FY 2023 Plans:*** Continue working with the USN AARGM-ER Program Office on the warhead/ESAF development, test, integration, and qualification. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increased due to amount of support needed to accomplish scheduled development efforts.			
Title: Universal Armament Interface (UAI) / Anti-Radiation Homing (ARH) message / SEPM	10.540	0.000	12.040
Description: Develop and test a UAI/ARH message set for the AARGM-ER missile. ***FY 2022 Plans:***			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0207328F / *Stand In Attack Weapon*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Continue to test, certify, and validate the UAI/ARH for the AARGM-ER missile. This year is funded with FY21 dollars. ***FY 2023 Plans:*** Continue testing, certification and validation of the UAI/ARH for the AARGM-ER missile. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increased due to amount of support needed to accomplish scheduled development efforts.			
Title: F-35 Integration ***Description:*** Integration of the AARGM-ER and SiAW missiles onto the F-35. Efforts for aircraft integration will address the F-35 aircraft software development, Mission Planning capability, engineering to support weapon integration, testing, and airworthiness certification for the missile carriage and employment efforts. ***FY 2022 Plans:*** Integrate the AARGM-ER on the F-35 as an interim combat capability; includes ground testing, F-35 weapon integration, launcher adapter development and mission planning. ***FY 2023 Plans:*** Continue integrating the AARGM-ER on the F-35 as an interim combat capability; includes ground testing, F-35 weapon integration, launcher adapter development and mission planning. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increased due to ramp up of AARGM-ER integration activities on the F-35.	2.041	10.950	26.574
Title: Advanced Technology Risk Reduction ***Description:*** Conduct risk reduction on emerging technologies for future SiAW tech insertion to maintain operational effectiveness in classified scenarios. ***FY 2022 Plans:*** Risk Reduction efforts for the technology maturation of critical components transition to SiAW Development Major Thrust. ***FY 2023 Plans:*** Risk Reduction efforts for the technology maturation of critical components transition to SiAW Development Major Thrust. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** No increase/decrease	31.606	0.000	0.000
Title: SiAW Development	22.505	121.293	172.599

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0207328F / *Stand In Attack Weapon*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Description: Conduct development and testing of discrete SiAW technologies as well as the integrated SiAW weapons system. This includes the development of an initial SiAW capability via the Middle Tier Acquisition described in Section A, as well as a post-MTA activity that will bring additional capability and integrate the weapon onto the F-35. ***FY 2022 Plans:*** Begin Phase 1 of the MTA which will initiate the SiAW detailed design work and integration of critical components in a Model Based System Engineering environment, leading up to a PDR-like event at the end of Phase 1 in 2023. ***FY 2023 Plans:*** Continue work on Phase 1 that begun in FY22 and proceed to a PDR-like event in a Model Based System Engineering environment by late FY23. Complete acquisition planning for Phase 2 and prepare for a competitive selection in late FY23. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increased due to ramp up of system design and integration activities and initial evaluation of advanced technologies.			
Title: Target/Test Assets, Testing, & Support ***Description:*** Provides associated government and contract support for F-35 developmental and operational testing for AARGM-ER and SiAW. Includes required test assets and support, flight test equipment, construction and procurement of targets to meet mission requirements, test wing and range support to include both sea and land ranges, and ground/flight test support. ***FY 2022 Plans:*** Conduct test/range/ground support, purchase targets, test equipment, and test assets. Continue target/threat emitter acquisition to include weapon cybersecurity support and test investments, and development of flight telemetry and termination system. ***FY 2023 Plans:*** Continue test support, purchasing test equipment, target construction, range/ground support, and test assets. Continue target/threat emitter acquisition to include weapon cybersecurity support and test investments and development of flight telemetry and termination system. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increased due to variation in test and target costs.	15.086	34.327	67.731
Accomplishments/Planned Programs Subtotals	145.858	166.570	283.152

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0207328F / *Stand In Attack Weapon*

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• RDTE 07 0205601N: *AARGM-ER (Navy)*	126.897	123.445	82.614	-	82.614	41.078	6.877	6.160	6.088	0.000	393.159
• MPAF 02 0207328F: *Stand-In Attack Weapon*	-	-	77.975	-	77.975	41.710	207.739	273.593	254.689	7,784.500	8,640.206

Remarks

RDTE: US Navy AARGM-ER Program Office, Anti-Radiation Missile Improvement Systems Development US Navy appropriation RDT&E 1319.
MPAF: Funding contained in procurement document utilized to procure initial production lot of AARGM-ER weapons.

E. Acquisition Strategy

The Stand-in Attack Weapon (SiAW) program will utilize a multi-phase approach to migrate advanced technologies and weapon designs into an Model Based System Engineering (MBSE) environment and then rapidly evolve the designs for an initial capability followed by a more comprehensive capability. The first Phases (1 & 2) have been approved as a Middle Tier of Acquisition (MTA) program, and will focus on the integration of key technologies, the implementation of digital acquisition, a competitive selection, and an initial capability on a surrogate aircraft in less than 5 yrs. In Phase 3, sometimes referred to as the "Post-MTA" phase, the SiAW program plans to transition to a Major Capability Acquisition (MCA) where the capability will be improved and the system will be integrated on the F-35A.

Key tenets of the SiAW program will be the establishment/use of a MBSE environment, implementation of a Weapon Open System Architecture (WOSA), and Agile Software Development.

Air Force plans to continue Navy-led AARGM-ER investments to field an interim combat capability on the F-35.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0207328F / *Stand In Attack Weapon*	Project (Number/Name) 653133 / *Stand In Attack Weapon*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Warhead / ESAF Development	MIPR	NGDS : Northridge, CA	19.215	9.833	Dec 2020	0.000	Dec 2021	4.208	Jul 2023	-		4.208	0.000	33.256	-
Universal Armament Interface (UAI) Anti-Radiation Homing message (ARH)	MIPR	Various : Various	1.134	2.620	Dec 2020	0.000	Dec 2021	12.040	Nov 2022	-		12.040	0.000	15.794	-
KTR SEPM	MIPR	NGDS : Northridge, CA	20.230	62.167	Dec 2020	0.000	Dec 2021	0.000	Nov 2022	-		0.000	0.000	82.397	-
F-35 Integration	MIPR	Various : Various	9.632	0.441	Apr 2021	10.000	May 2022	26.574	Jan 2023	-		26.574	376.930	423.577	-
Mission Planning	MIPR	Various : Various	0.190	1.600	Feb 2021	0.950	Jun 2022	0.000	Nov 2022	-		0.000	0.000	2.740	-
Advanced Technology Risk Reduction	MIPR	Various : Various	65.527	31.606	Dec 2020	0.000	Dec 2021	0.000		-		0.000	0.000	97.133	-
SiAW Development	Various	Various : Various	1.125	13.825	Feb 2021	107.000	Apr 2022	150.901	Jul 2023	-		150.901	1,230.200	1,503.051	-
		Subtotal	117.053	122.092		117.950		193.723		-		193.723	1,607.130	2,157.948	N/A

Remarks

Northrop Grumman Defense Systems (NGDS)

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Civ Pay - Direct Site Authorization (DCA)	Allot	AFLCMC/FZA : Wright Pat, OH	4.097	4.000		4.700		8.966		-		8.966	69.736	91.499	-
		Subtotal	4.097	4.000		4.700		8.966		-		8.966	69.736	91.499	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Assets AARGM-ER	MIPR	NGDS : Northridge, CA	10.411	8.808	Jun 2021	21.390	Feb 2022	20.924	Jan 2023	-		20.924	2.385	63.918	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0207328F / *Stand In Attack Weapon*	Project (Number/Name) 653133 / *Stand In Attack Weapon*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Assets SiAW	Various	Various : Various	0.000	0.000		0.000		22.807	Apr 2023	-		22.807	344.981	367.788	-
KTR Subsystem Testing	MIPR	NGDS : Northridge, CA	0.000	0.000	Apr 2021	0.000	Apr 2022	0.000	May 2023	-		0.000	0.000	0.000	-
Government Test/Target Support (includes flight test equipment, Targets/ shapes builds, 96 TW range, and SEEK Eagle support)	Various	Various : Various	5.719	6.278		12.937		24.000		-		24.000	93.895	142.829	-
		Subtotal	16.130	15.086		34.327		67.731		-		67.731	441.261	574.535	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Administration and Advisory Services (A&AS)	Various	Various : Various	7.082	4.680		9.593		12.732		-		12.732	61.350	95.437	-
		Subtotal	7.082	4.680		9.593		12.732		-		12.732	61.350	95.437	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	144.362	145.858		166.570		283.152		-		283.152	2,179.477	2,919.419	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0207328F / *Stand In Attack Weapon*	**Project (Number/Name)** 653133 / *Stand In Attack Weapon*

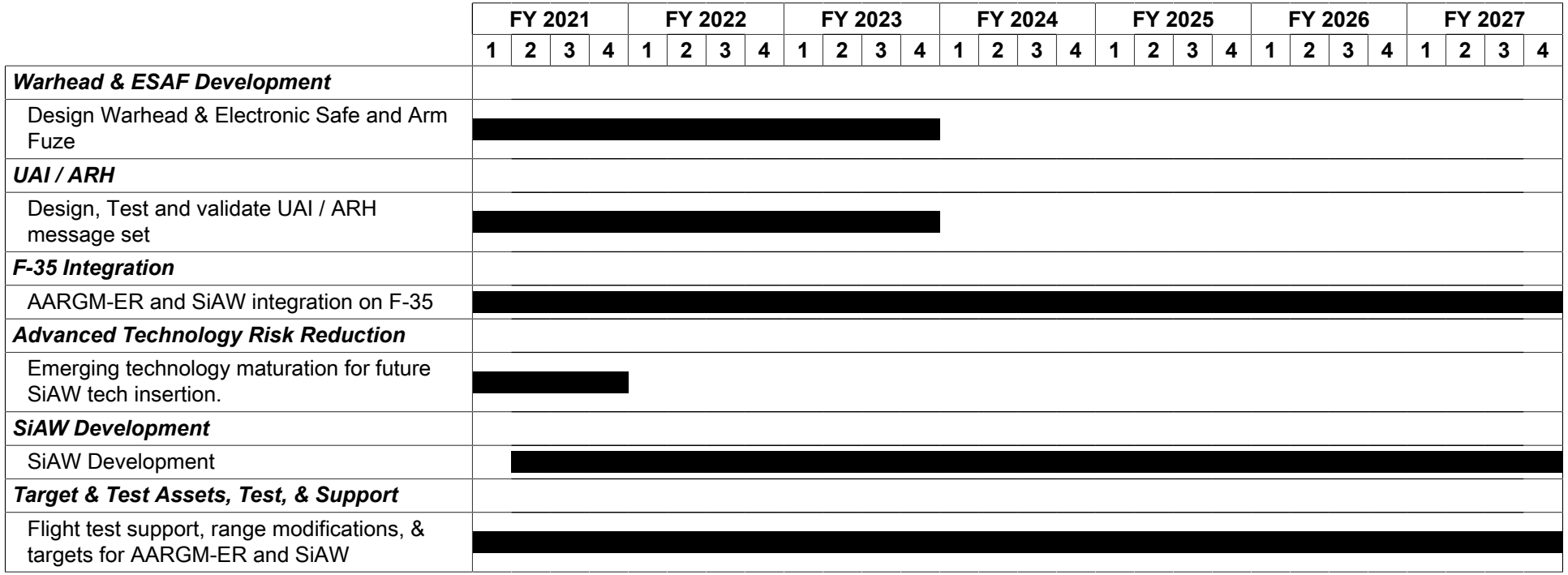

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0207328F / *Stand In Attack Weapon*	**Project (Number/Name)** 653133 / *Stand In Attack Weapon*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Warhead & ESAF Development				
Design Warhead & Electronic Safe and Arm Fuze	1	2021	4	2023
UAI / ARH				
Design, Test and validate UAI / ARH message set	1	2021	4	2023
F-35 Integration				
AARGM-ER and SiAW integration on F-35	1	2021	4	2027
Advanced Technology Risk Reduction				
Emerging technology maturation for future SiAW tech insertion.	1	2021	4	2021
SiAW Development				
SiAW Development	2	2021	4	2027
Target & Test Assets, Test, & Support				
Flight test support, range modifications, & targets for AARGM-ER and SiAW	1	2021	4	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0207701F / *Full Combat Mission Training*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	9.060	12.064	3.028	0.000	3.028	7.597	7.740	7.903	8.078	Continuing	Continuing
655012: *Full Combat Mission Training*	-	9.060	12.064	3.028	0.000	3.028	7.597	7.740	7.903	8.078	Continuing	Continuing

A. Mission Description and Budget Item Justification

Full Combat Mission Training (FCMT) supports Air Force Distributed Mission Operations (DMO) and Live-Virtual-Constructive (LVC) integration. FCMT funding provides research in areas benefiting the DMO/LVC environment as a whole; provides research and development to facilitate integration of fielded and newly acquired, Air Force owned training devices into DMO/LVC networks; enhances the quality of training for the systems added to the network; enables aircrews to network with LVC components to form the integrated DMO battlespace; links geographically distributed high-fidelity combat and combat support training devices including Command and Control and Intelligence, Surveillance, and Reconnaissance systems and develops, demonstrates and inserts Multi-Level Security (MLS) capability. This capability enables warfighters to exercise and train at the operational and strategic levels of war as well as conduct networked unit-level training at home station.

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 FY21 $0.0M was expended for civilian pay expenses in this program element, and in FY22 $0.0M 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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	9.405	7.064	0.000	0.000	0.000
Current President's Budget	9.060	12.064	3.028	0.000	3.028
Total Adjustments	-0.345	5.000	3.028	0.000	3.028
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	5.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.345	0.000			
• Other Adjustments	0.000	0.000	3.028	0.000	3.028

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0207701F / *Full Combat Mission Training*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Project: 655012: *Full Combat Mission Training*		
Congressional Add: *Airborne Augmented Reality for Pilot Training*	0.000	5.000
Congressional Add Subtotals for Project: 655012	0.000	5.000
Congressional Add Totals for all Projects	0.000	5.000

Change Summary Explanation

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY 2023 cannot be made in a relevant manner.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0207701F / *Full Combat Mission Training*	Project (Number/Name) 655012 / *Full Combat Mission Training*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
655012: *Full Combat Mission Training*	-	9.060	12.064	3.028	0.000	3.028	7.597	7.740	7.903	8.078	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Full Combat Mission Training (FCMT) supports Air Force Distributed Mission Operations (DMO) and Live-Virtual-Constructive (LVC) integration. FCMT funding provides research in areas benefiting the DMO/LVC environment as a whole; provides research and development to facilitate integration of fielded and newly acquired, Air Force owned training devices into DMO/LVC networks; enhances the quality of training for the systems added to the network; enables aircrews to network with LVC components to form the integrated DMO battlespace; links geographically distributed high-fidelity combat and combat support training devices including Command and Control and Intelligence, Surveillance, and Reconnaissance systems and develops, demonstrates and inserts Multi-Level Security (MLS) capability. This capability enables warfighters to exercise and train at the operational and strategic levels of war as well as conduct networked unit-level training at home station.

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 FY21 $0.0M was expended for civilian pay expenses in this program element, and in FY22 $0.0M is forecasted for civilian pay expenses in this program element.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Cross Domain Solutions (CDS)	1.534	1.458	0.980
Description: Development, demonstration, and insertion of Multi-Level Security (MLS) capability supporting Live Virtual Constructive training for fifth generation platforms.			
FY 2022 Plans: Continue encrypted data integration for Cross Domain Solutions (CDS) supporting Augmented Reality Virtual Reality (AR VR) and trainer technology insertion for fifth generation aircraft platforms.			
FY 2023 Plans: Deliver F-35 Cross Domain Solutions (CDS) to demonstrate/validate/update 4th to 5th gen integrated secure training. Establish relevant Operational Test and Training Infrastructure efforts supporting Live, Virtual, and Constructive (LVC) test and training for fifth generation aircraft.			
FY 2022 to FY 2023 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0207701F / *Full Combat Mission Training*	**Project (Number/Name)** 655012 / *Full Combat Mission Training*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Funding decreased due to nearing completion of evaluation and assessment of Cross Domain Solutions.			
Title: Distributed Mission Operations Development ***Description:*** Development, demonstrations, studies and insertions of Live Virtual Constructive related technologies and proficiency based continuation training strategies. ***FY 2022 Plans:*** Demonstrate common learning/scenario management capabilities in local unit and larger scale events. Begin creation/ modifications of standards to support learning managed readiness. Create standards-based specifications for integrating innovative technologies. ***FY 2023 Plans:*** Complete enhanced analytics for local unit and larger distributed events. Demonstrate learning management and scenario capabilities for proficiency-based training with Joint Synthetic Environment/Effects Based Simulation. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreased due to reducing support studies and enhanced analytics for Distributed Mission Operations and Live Virtual Constructive training.	4.132	2.980	0.803
Title: Development and validation of Live Virtual Constructive assessment tools. ***Description:*** Studies to assess and validate Live Virtual Constructive (LVC) training and accreditation of portions of this process; studies to develop objective enhancement and measurement tools for the LVC environment. ***FY 2022 Plans:*** Continue development and field test of LVC environment assessment tools. Evaluate readiness tracking database integration for routine use in ops. Complete initial evaluations of readiness data integration with current readiness reporting Systems of Record. Begin encrypted range data integration for warfighter and complete field evaluation and refinement of LVC environment assessment tool and metrics. ***FY 2023 Plans:*** Complete validation of training environment assessments for an identified set of ACC Virtual and Constructive environments. Continue readiness metrics and tracking tools refinement to measure training proficiency gained during live, virtual, constructive events. Begin development of secure cloud-based readiness data tracking, storage and retrieval for training. ***FY 2022 to FY 2023 Increase/Decrease Statement:***	2.044	1.525	0.620

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0207701F / *Full Combat Mission Training*	**Project (Number/Name)** 655012 / *Full Combat Mission Training*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Funding decreased due to nearing completion of initial assessment of Live Virtual Constructive tools.			
Title: Network Studies	1.350	1.101	0.625
Description: Research and development to provide for the integration of fielded and newly introduced, Air Force, Joint and Coalition high-fidelity flight and mission trainers. ***FY 2022 Plans:*** Continue development and evaluation of data specifications that enable more rapid, higher fidelity constructive modeling in Distributed Mission Operations (DMO). Continue development and evaluation of lower cost simulation environments to augment training, rehearsal and exercise at local units and at larger event locations. Continue solution analyses for peer fight gaps identified in field training and exercise environment evaluations. Complete AR VR database development for AR VR applications. Complete learning management tools evaluations and make recommendations for alternatives for fuller integration. Complete initial data specifications for rapid model development and integration. ***FY 2023 Plans:*** Begin integration and evaluation of a proficiency-based learning ecosystem for Combat Air Force (CAF) future training. Begin alignment of CAF proficiency based training capabilities with Air Education and Training Command (AETC) Pilot Training Transformation. Continue development and evaluation of tools to create contested effects in local and distributed training events. Continue creation and evaluation of GOTS/COTS lightweight simulators for deployable training. Complete development and fielding of Augmented Reality Virtual Reality technology and tools repository for maintenance and tactical training. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreased due to finalizing initial studies for development of specifications for Live Virtual Constructive training.			
Accomplishments/Planned Programs Subtotals	9.060	7.064	3.028

	FY 2021	FY 2022
Congressional Add: Airborne Augmented Reality for Pilot Training	0.000	5.000
FY 2021 Accomplishments: N/A		
FY 2022 Plans: Develop capability and airborne augmented reality technology for pilot training.		
Congressional Adds Subtotals	0.000	5.000

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0207701F / *Full Combat Mission Training*	**Project (Number/Name)** 655012 / *Full Combat Mission Training*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

Air Force Research Laboratory (AFRL) will conduct research/studies to develop/implement Cross Domain Solutions (CDS) supporting Live Virtual Constructive (LVC) training. Fielded and projected Air Force flight and mission training systems without LVC capability will be modified to ensure training compatibility.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0207701F / *Full Combat Mission Training*	**Project (Number/Name)** 655012 / *Full Combat Mission Training*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Augmented Reality Development	TBD	Air Force Research Lab : WPAFB, OH	-	-		5.000	Jan 2023	-		-		-	Continuing	Continuing	-
		Subtotal	-	-		5.000		-		-		-	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Cross Domain Solutions (CDS): Development, Testing and insertion of Mufti-Level-Security protocols, Cross Domain rule set development and accreditation	Various	Air Force Research Lab, 711 Human Performance Wing, Human : Dayton, OH	-	1.534	Jan 2021	1.458	Jan 2022	0.980	Jan 2023	-		0.980	Continuing	Continuing	-
Develop DMO Capabilities: demonstration, studies and insertion of distributed mission ops related technologies and proficiency based continuation training	Various	Air Force Research Lab, 711 Human Performance Wing : Dayton, OH	-	4.132	Jan 2021	2.980	Jan 2022	0.803	Jan 2023	-		0.803	Continuing	Continuing	-
Validation of warfighter seasoning and development of objective performance enhancements for DMO/ LVC environment	Various	Air Force Research Lab, 711 Human Performance Wing : Dayton, OH	-	2.044	Jan 2021	1.525	Jan 2022	0.620	Jan 2023	-		0.620	Continuing	Continuing	-
Other Network Studies: Supporting integration of newly fielded high-fidelity training systems and networks	Various	Air Force Research Lab, 711 Human Performance Wing : Dayton, OH	-	1.350	Jan 2021	1.101	Jan 2022	0.625	Jan 2023	-		0.625	Continuing	Continuing	-
		Subtotal	-	9.060		7.064		3.028		-		3.028	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0207701F / *Full Combat Mission Training*	Project (Number/Name) 655012 / *Full Combat Mission Training*	

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	9.060		12.064		3.028		-		3.028	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0207701F / *Full Combat Mission Training*	**Project (Number/Name)** 655012 / *Full Combat Mission Training*

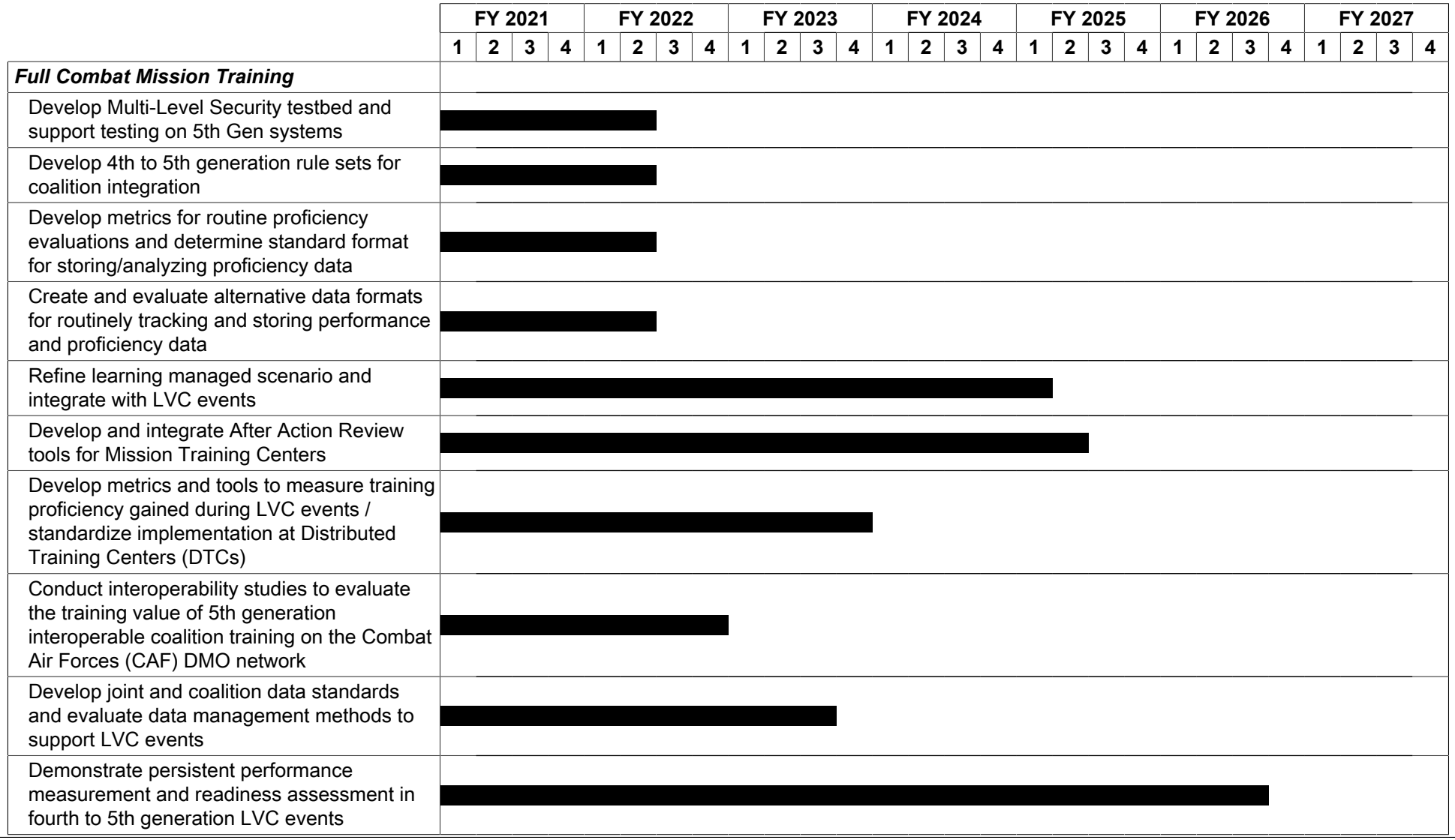

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0207701F / *Full Combat Mission Training*	**Project (Number/Name)** 655012 / *Full Combat Mission Training*

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0207701F / *Full Combat Mission Training*	**Project (Number/Name)** 655012 / *Full Combat Mission Training*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Full Combat Mission Training				
Develop Multi-Level Security testbed and support testing on 5th Gen systems	1	2021	2	2022
Develop 4th to 5th generation rule sets for coalition integration	1	2021	2	2022
Develop metrics for routine proficiency evaluations and determine standard format for storing/analyzing proficiency data	1	2021	2	2022
Create and evaluate alternative data formats for routinely tracking and storing performance and proficiency data	1	2021	2	2022
Refine learning managed scenario and integrate with LVC events	1	2021	1	2025
Develop and integrate After Action Review tools for Mission Training Centers	1	2021	2	2025
Develop metrics and tools to measure training proficiency gained during LVC events / standardize implementation at Distributed Training Centers (DTCs)	1	2021	4	2023
Conduct interoperability studies to evaluate the training value of 5th generation interoperable coalition training on the Combat Air Forces (CAF) DMO network	1	2021	4	2022
Develop joint and coalition data standards and evaluate data management methods to support LVC events	1	2021	3	2023
Demonstrate persistent performance measurement and readiness assessment in fourth to 5th generation LVC events	1	2021	3	2026
Develop gateways and CDS to integrate high-fidelity trainers with Air Force, joint, and coalition networks	1	2021	1	2024
Evaluate compressed DIS network standards for CDS in DMO	1	2021	3	2025
Integrate and evaluate multi-domain operations and kill-chain training scenarios for contested environments	1	2021	2	2024
Evaluate multi-national mission planning and debrief technologies in research training events	1	2021	4	2024

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0207701F / *Full Combat Mission Training*	**Project (Number/Name)** 655012 / *Full Combat Mission Training*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Implement, evaluate, and field technologies aligned with future training strategies for LVC	1	2021	2	2025
Develop specifications for live data harvesting using encrypted systems and tools	2	2023	4	2026
Update Five Eyes (FVEY) rule sets for full 4th, 5th and autonomous tactical employment training	4	2024	4	2026
Create Secure LVC testbed environment for kill chain and JADC2 ops training via DMO	3	2022	2	2026
Augmented Reality Development				
Release Request For Proposal (RFP)	3	2022	3	2022
Award Development Contract	2	2023	2	2023
Begin initial design and development efforts	2	2023	2	2024

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0303667F / *Citizen Broadband Radio System*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	2.306	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
658064: *Citizen Broadband Radio System (CBRS)*	-	2.306	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

This program provides for transition activities necessary to ensure protection of incumbent spectrum dependent systems and military operations functioning within a given auctioned spectrum band. Activities focus on ecosystem validations, environmental assessments, and continued industry engagement to refine the indefinite sharing infrastructure.

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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	2.306	0.000	0.000	0.000	0.000
Total Adjustments	2.306	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	2.306	0.000	0.000	0.000	0.000

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Protection of incumbent spectrum dependent activities	2.306	-	-
Description: Protection of incumbent spectrum dependent systems and military operations functioning within a given auctioned spectrum band.			
Accomplishments/Planned Programs Subtotals	2.306	-	-

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0303667F / *Citizen Broadband Radio System*

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0303667F / *Citizen Broadband Radio System*	Project (Number/Name) 658064 / *Citizen Broadband Radio System (CBRS)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Protection of Incumbent Spectrum Depentend Systems	Various	Various : TBD	-	2.306	Apr 2021	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	2.306		-		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	2.306		-		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0303667F / *Citizen Broadband Radio System*	**Project (Number/Name)** 658064 / *Citizen Broadband Radio System (CBRS)*

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
Protection of Incumbent Spectrum Activities																												
No event title.	[redacted]																											

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0303667F / *Citizen Broadband Radio System*	**Project (Number/Name)** 658064 / *Citizen Broadband Radio System (CBRS)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Protection of Incumbent Spectrum Activities				
No event title.	1	2021	4	2021

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0303767F / *AMBIT - Pre-Auctioned SRF*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	5.270	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
658065: *AMBIT - Pre-Auctioned SRF*	-	5.270	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

This program pays for relocation or sharing costs related to relocating from and/or sharing a frequency that has been auctioned off to the commercial sector, that was previously used by DoD.

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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	5.270	0.000	0.000	0.000	0.000
Total Adjustments	5.270	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	5.270	0.000	0.000	0.000	0.000

Change Summary Explanation

Funding transferred by OMB after autions are complete.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Relocation of electromagnetic spectrum	5.270	-	-
Description: This effort pays for relocation costs for previously reserved electromagnetic spectrum that has been auctioned off to the commercial sector.			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0303767F / *AMBIT - Pre-Auctioned SRF*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Accomplishments/Planned Programs Subtotals	5.270	-	-

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0303767F / *AMBIT - Pre-Auctioned SRF*	Project (Number/Name) 658065 / *AMBIT - Pre-Auctioned SRF*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Spectrum Relocation Services	Various	Various : TBD	-	5.270	Apr 2021	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	5.270		-		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	5.270		-		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0303767F / *AMBIT - Pre-Auctioned SRF*	**Project (Number/Name)** 658065 / *AMBIT - Pre-Auctioned SRF*

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
Spectrum Relocation Services																												
No event title.	[redacted]																											

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0303767F / *AMBIT - Pre-Auctioned SRF*	**Project (Number/Name)** 658065 / *AMBIT - Pre-Auctioned SRF*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Spectrum Relocation Services				
No event title.	1	2021	4	2021

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0305176F / *Combat Survivor Evader Locator*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	0.935	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
654522: *CSAR EMD*	-	0.935	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

Personnel Recovery is the United States Air Force's effort to prepare for and execute recovery and reintegration of isolated personnel. The Combat Survivor Evader Locator (CSEL) System is the US Department of Defense's (DoD) Program of Record for Joint Search and Rescue, to locate, authenticate, and communicate with Joint forces who become isolated personnel. The Hand Held Radio (HHR) is the primary communications link for Joint forces who become isolated personnel in contested environments. The HHR provides secure, over-the-horizon, two-way data communications and precise geo-positioning information to rescue forces. It can operate in an anti-access/area denial (A2/AD) environment by providing a low probability of intercept/low probability of detection communications for isolated personnel. The HHR is one segment of the overall CSEL command and control architecture, including the UHF satellite base stations (UBS) and the Joint Personnel Recovery Center web application. The current HHR encryption requires modification to comply with current National Security Agency (NSA) cryptographic standards. The NSA is discontinuing the production and distribution of DES-based cryptographic keying material.

The HHR has significantly diminishing material sources and unsupportable hardware, including reliance on legacy Ultra High Frequency (UHF) satellite communication. UHF capabilities are nearing the end of life, and the CSEL system must move to next-generation secured satellite communication. In concert with the Services and the CSEL Joint Program Office, the Navy conducted a Business Case Analysis. It determined that a recapitalization of the CSEL HHR was more cost-effective than modifying the existing AN/PRQ-7/A. This effort is known as Next Generation Survival Radio (NGSR). The CSEL Joint Program Management Office (JPMO) will execute the NGSR effort in a two-pronged approach:
1.The program will leverage Gov't-owned satellite systems to establish a modern Beyond Line of Sight (BLOS) capability to replace legacy UHF capabilities and ensure encrypted voice and data communication.
2.The program office will replace the existing HHR with an Industry-led next-generation survival device. The hand-held device will meet all requirements found in the Operational Requirements Document.

The CSEL JPMO will execute funding to validate and verify Government and Industry-led solutions, minimize risk, and accelerate capability maturation. The JPMO will involve Stakeholders across the Joint Services, National Agencies, and Operational community to meet the intent and maintain the integrity of the Joint Capability. The JPMO will foster a competitive acquisition through Requests For Proposals, including downselect and prototype development opportunities.

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force					Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0305176F / *Combat Survivor Evader Locator*		
B. Program Change Summary ($ in Millions)	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**
Previous President's Budget	0.971	0.000	0.000	0.000	0.000
Current President's Budget	0.935	0.000	0.000	0.000	0.000
Total Adjustments	-0.036	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	-0.036	0.000	0.000	0.000	0.000

Change Summary Explanation

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY 2023 cannot be made in relevant manner.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 1203176F / *Combat Survivor Evader Locator*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	0.000	0.000	0.000	0.000	2.252	2.257	2.307	Continuing	Continuing
654522: *CSAR EMD**	-	0.000	0.000	0.000	0.000	0.000	0.000	2.252	2.257	2.307	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

*This project's R-2a exhibit has been suppressed due to funding not beginning until after FY 2023

A. Mission Description and Budget Item Justification

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	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

Change Summary Explanation

FY 2021: Funding transferred to PE 0305176F.

C. Accomplishments/Planned Programs ($ in Millions)

N/A

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 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0401221F / *KC-46A Tanker Squadrons*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	5,787.524	35.818	66.758	197.510	0.000	197.510	73.709	93.448	192.058	106.566	Continuing	Continuing
651120: *Pegasus Capability Improvements*	0.000	5.964	19.653	64.310	0.000	64.310	19.595	0.000	0.000	0.000	97.028	206.550
655271: *KC-46 RDT&E*	5,787.524	29.854	47.105	121.919	0.000	121.919	34.809	0.000	0.000	0.000	26.216	6,047.427
655KCY: *BA5 0401221F 655KCY KC-Y*	0.000	0.000	0.000	11.281	0.000	11.281	19.305	93.448	192.058	106.566	Continuing	Continuing
Program MDAP/MAIS Code: 387												

Note

This program, BA 5, PE 0401221F, project 655KCY, Support, is a new start.

In FY 2021, Program Element (PE) 0605221F KC-46, Project 655271 KC-46 RDT&E, and Project 651120 Pegasus Capability Improvements efforts were transferred to PE 401221F, Project 655271 KC-46 RDT&E, and Project 651120 Pegasus Capability Improvements in order to consolidate all KC-46 activity under a single PE. PE 0401221F also has historical Tanker Replacement costs from FY 2005-2008 reflected in prior years. PE 0605221F has costs from FY 2009 to FY 2020.

A. Mission Description and Budget Item Justification

Replacement of the legacy tanker fleet will take place in several stages. The initial tanker replacement increment of KC-46s will replace roughly a third of the current capability. Future programs will ultimately recapitalize the entire tanker fleet over a period of more than 30 years. The Air Force completed an Analysis of Alternatives (AoA) in Apr 2006 to determine the most appropriate strategy to recapitalize the aging fleet of aerial refueling aircraft. Based on this analysis, the Air Force concluded a strategy of full and open competition to select a commercial derivative replacement tanker aircraft would result in a best value tanker contract. To initiate the first phase of the tanker replacement, the KC-46 program released a final Request for Proposal (RFP) on 24 Feb 2010, and entered source selection on 9 Jul 2010. The KC-46 program held a Milestone B (MS B) Defense Acquisition Board (DAB) on 23 Feb 2011, received approval to enter Engineering and Manufacturing Development (EMD) from the Undersecretary of Defense (Acquisition, Technology and Logistics) (USD(AT&L)) on 24 Feb 2011, and awarded the KC-46 EMD contract to Boeing on 24 Feb 2011 to develop and procure 179 KC-46 aircraft. The program is procuring four RDT&E aircraft for integration and demonstration of capability which will ultimately be operationally fielded. During production, the program plans to procure 175 aircraft throughout 13 lots. The KC-46 program held a MS C DAB on 12 Aug 2016 and received approval to enter Low Rate Initial Production (LRIP). The program awarded LRIP Lots 1 and 2 on 18 Aug 2016, LRIP Lot 3 on 27 Jan 2017, LRIP Lot 4 on 10 Sep 2018, and LRIP Lot 5 on 27 Sep 2019. Awards for Lot 6 occurred on 12 Jan 2021 and Lot 7 awarded on 20 Jan 2021 totaling 94 contracted production aircraft to date. Lot 8 is planned for award in 2022. The Air Force delivered the first KC-46 to McConnell Air Force Base on 25 Jan 2019. As of 18 Mar 2022, 57 aircraft have been delivered to the Air Force. KC-46 funding also supports Training Systems, Direct Mission Support, Program Support Costs (PSC) activities, government developmental and operational test support, mission planning capability development, various studies and analyses, KC-46 requirements definition and demonstrations in support of Air Force Advanced Battle Management (ABMS) initiative, engineering changes, and future tanker replacement planning activities.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0401221F / *KC-46A Tanker Squadrons*

The KC-46 will provide the capability to fuel joint and coalition receivers via a boom or drogue system on every mission and will also augment the airlift fleet with cargo, passenger, and aeromedical evacuation capabilities. The KC-46 will operate in day/night and adverse weather conditions to enable deployment, employment, sustainment, and redeployment of U.S. joint, allied, and coalition forces. The KC-46 will have communication, navigation, and surveillance equipment for worldwide operations; the capability to perform missions in chemical and biological environments; the ability to operate in up to medium threat environments with self-defense/ protection (both active and passive) capabilities; and the necessary battlespace awareness to mitigate survivability threats.

The Aircrew Training System (ATS) and the Maintenance Training System (MTS) are being developed and procured using KC-46 funding. The ATS contract was awarded on 1 May 2013 to FlightSafety Services Corporation. The ATS contract will provide Aircrew Training Devices (ATDs) to include but not limited to Weapon System Trainers (WSTs), Boom Operator Trainers (BOTs), Fuselage Trainers (FuTs), and Part-Task Trainers (PTTs) at each Main Operating Base (MOB) and the Formal Training Unit (FTU). The ATS contract will also support Distributed Mission Operations (DMO), provide aircrew instruction, develop courseware, provide logistics support, acquire a technical data package to support future competition efforts, and manage training device concurrency with the aircraft.

The MTS contract was awarded 6 Jul 2016 to The Boeing Company. The MTS acquisition focuses on designing, developing, testing, producing, and fielding an optimized training system for KC-46 maintainers by integrating various forms of training media and Maintenance Training Devices (MTDs) into a "blended" solution. This blended solution includes the appropriate mix of hardware and software, "high-fidelity" Augmented Hardware Training Devices (AHTDs), PTTs, Interactive Multimedia Instruction (IMI), and emerging technologies to meet validated Air Mobility Command (AMC) maintenance training requirements.

This requirement supports performance of a full financial audit as required by title 10 U.S.C. Chapter 9A, Sec 240-D.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver KC-46 weapon system capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program elements 0605827F, 0605828F, 0605829F, 0605831F, 0605832F, 0605833F, 0605898F, and 0606398F. In FY 2021 $0.756 million was expended for civilian pay expenses in this program element, and in FY 2022 $2.173 million 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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force					Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0401221F / *KC-46A Tanker Squadrons*		
B. Program Change Summary ($ in Millions)	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**
Previous President's Budget	76.023	73.458	0.000	0.000	0.000
Current President's Budget	35.818	66.758	197.510	0.000	197.510
Total Adjustments	-40.205	-6.700	197.510	0.000	197.510
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-6.700			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-38.045	0.000			
• SBIR/STTR Transfer	-2.160	0.000			
• Other Adjustments	0.000	0.000	197.510	0.000	197.510

Change Summary Explanation

FY 2021 funding was reduced by a total of $40.205 million which included a $38.045 million reprogramming action for higher Air Force priorities and $2.160 million for Small Business Innovation Research.

FY 2022 funding was reduced by $6.7 million due to a Congressional Directed Reduction for Underexecution.

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY 2023 cannot be made in a relevant manner.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0401221F / *KC-46A Tanker Squadrons*	Project (Number/Name) 651120 / *Pegasus Capability Improvements*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
651120: *Pegasus Capability Improvements*	0.000	5.964	19.653	64.310	0.000	64.310	19.595	0.000	0.000	0.000	97.028	206.550
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The KC-46 will provide the capability to fuel joint and coalition receivers via a boom or drogue system on every mission and will also augment the airlift fleet with cargo, passenger, and aeromedical evacuation capabilities. The KC-46 will operate in day/night and adverse weather conditions to enable deployment, employment, sustainment, and redeployment of U.S. joint, allied, and coalition forces. The KC-46 will have communication, navigation, and surveillance equipment for worldwide operations; the capability to perform missions in chemical and biological environments; the ability to operate in up to medium threat environments with self-defense/ protection (both active and passive) capabilities; and the necessary battlespace awareness to mitigate survivability threats.

The dynamics and mission urgency of the post-production (post-DD-250) environment require the program to maintain a flexible and responsive posture to support a broad range of mission support needs. The KC-46 will continue to identify, design, develop, integrate, verify, certify, produce, install, field, and sustain a comprehensive range of non-recurring and recurring post-production, air vehicle enhancements and field support needs. These needs may originate from programmed Mobility Air Force (MAF) requirements, Combatant Commander Joint or Urgent Operational Needs (JUON/UON), non-programmed Federal Aviation Administration (FAA) directives, requirements identified and supported by HHQ Enterprise Capability Collaboration Teams (i.e., High Value Airborne Asset [HVAA], Air Superiority 2030, and Multi-Domain Command and Control [MDC2]), or correction of field deficiencies.

The KC-46 will continue to develop, field, and sustain warfighter capabilities to meet evolving threats and mission support requirements through Block or discrete modification or modernization programs depending on mission urgency, available funding, and programmatic and technical risks. Post-production requirements can include, but will not be limited to avionics and structural systems/ architecture and subsystem updates, general mission equipment updates and procurement, general sustainment support, studies and analyses, future Tanker requirements simulation and training, and correction of field deficiencies.

Project 651120 funding will also support Program Support Costs (PSC) activities, test support, mission planning capability development and various studies and analyses.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver KC-46 weapon system capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program elements 0605827F, 0605828F, 0605829F, 0605831F, 0605832F, 0605833F, 0605898F, and 0606398F. In FY 2021 $0.756 million was expended for civilian pay expenses in this program element, and in FY 2022 $2.173 million is forecasted for civilian pay expenses in this program element.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: KC-46A Block 1 Pegasus Advanced Communications Suite (PACS)	2.859	17.414	62.026	-	62.026

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0401221F / *KC-46A Tanker Squadrons*	**Project (Number/Name)** 651120 / *Pegasus Capability Improvements*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Description: The KC-46A Block 1 Pegasus Advanced Communications Suite (PACS) program will satisfy Department of Defense (DoD), National Security Agency (NSA), Department of Transportation (DoT), and USAF mandates by upgrading legacy Tactical Data Link 16, Beyond Line-of-Sight (BLOS) Ultra High Frequency (UHF) Line-of-Sight (LOS) capabilities with next-generation Link 16 terminals and UHF secure, global, BLOS and anti-jam LOS satellite voice communications capabilities for the KC-46 weapon system. PACS enables compatibility and interoperability with current and planned future joint and allied forces while simultaneously increasing the survivability of secure global voice and data communications capabilities between Mobility Air Force (MAF) C2 agencies and MAF aircraft operating worldwide in or near contested environments. ***FY 2022 Plans:*** Award of Block 1 PACS EMD program effort. ***FY 2023 Base Plans:*** Continuation of Block 1 PACS EMD program and associated contracting efforts. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increased due to ramp-up in Block 1 PACS EMD program contracting activities and development upgrades.					
Title: Support ***Description:*** Studies and analysis to support planning activities for future initiatives for upgrades, future tanker replacement planning, and other Program Support Costs. ***FY 2022 Plans:*** Program Office Support to include studies, analysis and planning. ***FY 2023 Base Plans:*** Continued Program Office Support to include studies, analysis and planning. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increased due to elevated planning activities for future tanker.	3.105	2.239	2.284	-	2.284
Accomplishments/Planned Programs Subtotals	5.964	19.653	64.310	-	64.310

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0401221F / *KC-46A Tanker Squadrons*	**Project (Number/Name)** 651120 / *Pegasus Capability Improvements*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• APAF 05 41221F/ KC046A: *KC-46A Tanker*	2.000	1.984	0.467	-	0.467	0.000	0.000	0.000	-	0.000	4.451

Remarks

D. Acquisition Strategy

The KC-46 Post-Production Change Management (PPCM) construct is comprised of processes and tools, specifically tailored to a broad spectrum of post-production requirements to support the KC-46 enterprise (e.g. weapon system, sustainability, training devices). PPCM is designed to leverage competition when applicable and emphasize configuration management and discrete cost accounting methodologies. KC-46 PPCM oversight will promote competition throughout the life cycle of the KC-46A fleet. All KC-46 post-production requirements and associated acquisition strategies will be carefully managed, reviewed, and approved at the appropriate levels by the KC-46 Division and/or Tanker Directorate senior functional leaders. PPCM requirements will employ multiple contract-types, tailored to the requirement and documented in discrete Acquisition Strategy Panel briefings, to minimize cost, technical, and schedule execution risks and ensure on-time deliverables. In addition, all ACAT-level programs, deriving from the PPCM process, will follow Department of Defense (DoD) Directive 5000.01 and DoD Instruction 5000.02 guidelines and directives, as applicable, to ensure management controls--commensurate with the scope and cost of the supported requirement.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0401221F / *KC-46A Tanker Squadrons*	Project (Number/Name) 651120 / *Pegasus Capability Improvements*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
KC-46A Capability Upgrades (to include modification and modernization)	SS/CPFF	The Boeing Company : Seattle, WA	0.000	2.859	Jun 2022	17.414	Jun 2022	62.026	Dec 2022	-		62.026	167.588	249.887	-
		Subtotal	0.000	2.859		17.414		62.026		-		62.026	167.588	249.887	N/A

Remarks

Target value is TBD since Block I PACS has not awarded yet.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Direct Mission Support	Various	KC-46 Program Office : Dayton, W-P AFB, OH	0.000	2.349	Oct 2021	0.066	Jun 2022	0.067	Mar 2023	-		0.067	2.732	5.214	-
Direct Cite Authority for Civilian Pay	RO	KC-46 Program Office : Dayton, W-P AFB, OH	0.000	0.756	Oct 2020	2.173	Oct 2021	2.217	Oct 2022	-		2.217	90.155	95.301	-
		Subtotal	0.000	3.105		2.239		2.284		-		2.284	92.887	100.515	N/A

Remarks

Target value is blank for Direct Mission Support since there are various contracts. Target Value is blank for Direct Cite Authority for Civilian Pay since funds are provided to the center to fund manpower.

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	5.964		19.653		64.310		-		64.310	260.475	350.402	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0401221F / *KC-46A Tanker Squadrons*	**Project (Number/Name)** 651120 / *Pegasus Capability Improvements*

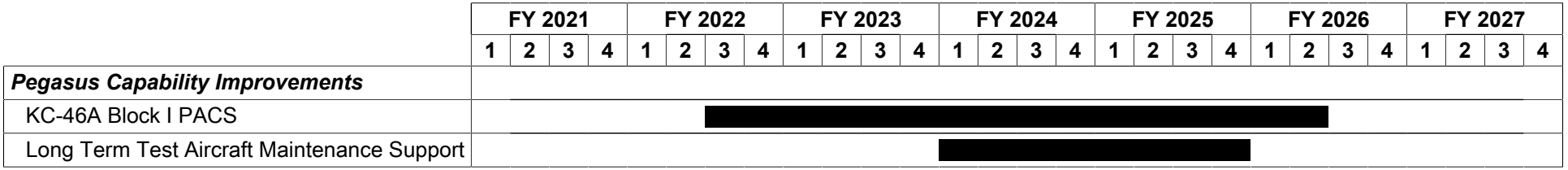

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0401221F / *KC-46A Tanker Squadrons*	**Project (Number/Name)** 651120 / *Pegasus Capability Improvements*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Pegasus Capability Improvements				
KC-46A Block I PACS	3	2022	2	2026
Long Term Test Aircraft Maintenance Support	1	2024	4	2025

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0401221F / *KC-46A Tanker Squadrons*	Project (Number/Name) 655271 / *KC-46 RDT&E*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
655271: *KC-46 RDT&E*	5,787.524	29.854	47.105	121.919	0.000	121.919	34.809	0.000	0.000	0.000	26.216	6,047.427
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY2021, PE 0605221F KC-46, Project 655271 KC-46 RDT&E, and Project 651120 Pegasus Capability Improvements efforts were transferred to PE 401221F, Project 655271 KC-46 RDT&E, and Project 651120 Pegasus Capability Improvements in order to consolidate all KC-46 activity under a single PE. PE 0401221F also has historical Tanker Replacement costs from FY 2005-2008 reflected in prior years. PE 0605221F has costs from FY2009 to FY2020.

A. Mission Description and Budget Item Justification

Replacement of the legacy tanker fleet will take place in several stages. The initial tanker replacement increment of KC-46s will replace roughly a third of the current capability. Future programs will ultimately recapitalize the entire tanker fleet over a period of more than 30 years. The Air Force completed an Analysis of Alternatives (AoA) in Apr 2006 to determine the most appropriate strategy to recapitalize the aging fleet of aerial refueling aircraft. Based on this analysis, the Air Force concluded a strategy of full and open competition to select a commercial derivative replacement tanker aircraft would result in a best value tanker contract. To initiate the first phase of the tanker replacement, the KC-46 program released a final Request for Proposal (RFP) on 24 Feb 2010, and entered source selection on 9 Jul 2010. The KC-46 program held a Milestone B (MS B) Defense Acquisition Board (DAB) on 23 Feb 2011, received approval to enter Engineering and Manufacturing Development (EMD) from the Undersecretary of Defense (Acquisition, Technology and Logistics) (USD(AT&L)) on 24 Feb 2011, and awarded the KC-46 EMD contract to Boeing on 24 Feb 2011 to develop and procure 179 KC-46 aircraft. The program is procuring four RDT&E aircraft for integration and demonstration of capability which will ultimately be operationally fielded. During production, the program plans to procure 175 aircraft throughout 13 lots. The KC-46 program held a MS C DAB on 12 Aug 2016 and received approval to enter Low Rate Initial Production (LRIP). The program awarded LRIP Lots 1 and 2 on 18 Aug 2016, LRIP Lot 3 on 27 Jan 2017, LRIP Lot 4 on 10 Sep 2018, and LRIP Lot 5 on 27 Sep 2019. Awards for Lot 6 occurred on 12 Jan 2021 and Lot 7 awarded on 20 Jan 2021 totaling 94 contracted production aircraft to date. Lot 8 is planned for award in 2022. The Air Force delivered the first KC-46 to McConnell Air Force Base on 25 Jan 2019. As of 18 Mar 2022, 57 aircraft have been delivered to the Air Force. KC-46 funding also supports Training Systems, Direct Mission Support, Program Support Costs (PSC) activities, government developmental and operational test support, mission planning capability development, various studies and analyses, KC-46 requirements definition and demonstrations in support of Air Force Advanced Battle Management (ABMS) initiative, engineering changes, and future tanker replacement planning activities.

The KC-46 will provide the capability to fuel joint and coalition receivers via a boom or drogue system on every mission and will also augment the airlift fleet with cargo, passenger, and aeromedical evacuation capabilities. The KC-46 will operate in day/night and adverse weather conditions to enable deployment, employment, sustainment, and redeployment of U.S. joint, allied, and coalition forces. The KC-46 will have communication, navigation, and surveillance equipment for worldwide operations; the capability to perform missions in chemical and biological environments; the ability to operate in up to medium threat environments with self-defense/ protection (both active and passive) capabilities; and the necessary battlespace awareness to mitigate survivability threats.

The Aircrew Training System (ATS) and the Maintenance Training System (MTS) are being developed and procured using KC-46 funding. The ATS contract was awarded on 1 May 2013 to FlightSafety Services Corporation. The ATS contract will provide Aircrew Training Devices (ATDs) to include but not limited to Weapon System Trainers (WSTs), Boom Operator Trainers (BOTs), Fuselage Trainers (FuTs), and Part-Task Trainers (PTTs) at each Main Operating Base (MOB) and the

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0401221F / *KC-46A Tanker Squadrons*	**Project (Number/Name)** 655271 / *KC-46 RDT&E*

Formal Training Unit (FTU). The ATS contract will also support Distributed Mission Operations (DMO), provide aircrew instruction, develop courseware, provide logistics support, acquire a technical data package to support future competition efforts, and manage training device concurrency with the aircraft.

The MTS contract was awarded 6 Jul 2016 to The Boeing Company. The MTS acquisition focuses on designing, developing, testing, producing, and fielding an optimized training system for KC-46 maintainers by integrating various forms of training media and Maintenance Training Devices (MTDs) into a "blended" solution. This blended solution includes the appropriate mix of hardware and software, "high-fidelity" Augmented Hardware Training Devices (AHTDs), PTTs, Interactive Multimedia Instruction (IMI), and emerging technologies to meet validated Air Mobility Command (AMC) maintenance training requirements.

This requirement supports performance of a full financial audit as required by title 10 U.S.C. Chapter 9A, Sec 240-D.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver KC-46 weapon system capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program elements 0605827F, 0605828F, 0605829F, 0605831F, 0605832F, 0605833F, 0605898F, and 0606398F. In FY 2021 $0.000 million was expended for civilian pay expenses in this program element, and in FY 2022 $0.000 million is forecasted for civilian pay expenses in this program element.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: KC-46 Aircraft Product Development	2.328	14.486	58.743	-	58.743
Description: EMD activities will be conducted to include the following types of activities: develop a commercial 767-2C aircraft upon which the KC-46 is based; develop the KC-46 military capability and integrate it into the aircraft; build four EMD aircraft; procure live fire assets; procure required Government Furnished Equipment (GFE); procure simulator and maintenance data; develop technical manuals and Type 1 training; and conduct development and operational testing. ***FY 2022 Plans:*** Continue product refinement, studies, ground, and flight testing in support of the KC-46 weapon system to include receiver certifications, simulator data collection, and completion of IOT&E events/reporting. Incrementally fund boom telescope actuator redesign (BTAR) Engineering Change Proposal (ECP) efforts (ongoing since 2020) and support other government costs associated with solution for Remote Vision System (RVS). Study, analyze, test and update documentation in order to certify and increase KC-46 capability for aerial refueling (AR) onload. Award contract and begin work for Take Off and Landing Data (TOLD) to address deficiencies and improve capability. ***FY 2023 Base Plans:*** Continue product refinement, studies, ground, and flight testing in support of the KC-46 weapon system to include receiver certifications, simulator data collection, and completion of IOT&E events/reporting. Incrementally fund boom telescope actuator redesign (BTAR) Engineering Change Proposal (ECP) efforts (ongoing since					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0401221F / *KC-46A Tanker Squadrons*	**Project (Number/Name)** 655271 / *KC-46 RDT&E*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
2020) and support other government costs associated with solution for Remote Vision System (RVS). Study, analyze, test and update documentation in order to certify and increase KC-46 capability for aerial refueling (AR) onload. Award contract and begin work for Take Off and Landing Data (TOLD) to address deficiencies and improve capability. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increased due to ramp up in contracting activities for BTAR Engineering Change Proposal (ECP) efforts and TOLD contracting award and execution.					
Title: KC-46 Trainer Product Development - Aircrew Training System (ATS) ***Description:*** Trainer development activities will be conducted to include the following types of activities: development and procurements of ATDs, courseware, and associated support equipment. ***FY 2022 Plans:*** ATS Night Vision Goggles (NVG) Training and ATS Enhanced Remote Vision System (ERVS) ***FY 2023 Base Plans:*** ERVS Upgrade and ATS Boom Upgrade ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increased due to ramp up in ATS Upgrades for RVS and Boom deficiency corrections support.	0.000	0.565	9.869	-	9.869
Title: KC-46 Test & Evaluation ***Description:*** Test & Evaluation (T&E) activities will be conducted to include the following types of activities: Development Test & Evaluation, Operational Test & Evaluation, Tanker Qualification, Receiver Certifications, Live Fire Test & Evaluation (LFT&E), Federal Aviation Administration (FAA) support, and other test planning and organizational support. ***FY 2022 Plans:*** Continue using EMD, pre-delivery production, and/or LRIP aircraft to support AR tanker-receiver certification testing, planning for Aerial Refueling Simulator Qualifications data collection, correction of deficiencies, and other T&E activities for the KC-46. Continue Government Test for RVS and BTAR. ***FY 2023 Base Plans:***	27.181	22.728	45.803	-	45.803

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0401221F / *KC-46A Tanker Squadrons*	**Project (Number/Name)** 655271 / *KC-46 RDT&E*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Continue using EMD, pre-delivery production, and/or LRIP aircraft to support AR tanker-receiver certification testing, Aerial Refueling Simulator Qualifications data collection, correction of deficiencies, and other T&E activities for the KC-46. Continue Government Test for RVS and BTAR. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increased due to elevated requirements for the Long Term Test Aircraft Maintenance Support contract (LTTAMS).					
Title: KC-46 Support ***Description:*** Development, integration, and demonstration of the KC-46 mission planning capability. In addition, studies and analysis to support planning activities for future efficiency initiatives, business case analyses, future tanker replacement planning, and miscellaneous Program Office support and planning. Also includes requirements such as travel, office supplies, training courses, and service contracts. ***FY 2022 Plans:*** Continue Program Office Support and Planning and start Future Tanker Program Analysis of Alternatives effort. ***FY 2023 Base Plans:*** Continue Program Office Support and Planning and continue Future Tanker Program Analysis of Alternatives effort. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decrease due to reduced tanker planning activities.	0.345	9.326	7.504	-	7.504
Accomplishments/Planned Programs Subtotals	29.854	47.105	121.919	-	121.919

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• APAF 02 Line Item KC046A: *KC-46A Tanker*	2,728.100	2,289.000	2,684.500	-	2,684.500	3,030.900	2,906.900	2,953.500	1,553.800	0.000	18,146.700
• APAF 06 Line Item 000999: *Initial Spares*	83.654	167.000	140.900	-	140.900	244.700	249.500	253.500	132.200	0.000	1,271.454

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0401221F / *KC-46A Tanker Squadrons*	**Project (Number/Name)** 655271 / *KC-46 RDT&E*

D. Acquisition Strategy

The KC-46 Program acquisition strategy is to procure an existing commercial, Federal Aviation Administration (FAA) certified aircraft modified to meet USAF requirements. The KC-46 program released a final RFP on 24 Feb 2010, and entered source selection on 9 Jul 2010. The KC-46 program held a Milestone B (MS B) Defense Acquisition Board (DAB) on 23 Feb 2011, received approval to enter EMD from the Undersecretary of Defense (Acquisition, Technology and Logistics) (USD(AT&L)) on 24 Feb 2011, and awarded the KC-46 contract to Boeing on 24 Feb 2011 to develop and procure 179 KC-46 aircraft. The KC-46 contract procurement was conducted via a full and open competition per Federal Acquisition Regulation (FAR) Part 15, and resulted in a FY 2011 Engineering and Manufacturing Development (EMD) Fixed Price Incentive Firm (FPIF) contract. The EMD phase is developing, building, and testing four KC-46 aircraft, and will qualify the KC-46 as a tanker and certify pairings with receiver aircraft.

The MS B acquisition strategy planned for two LRIP lots followed by 11 Full-Rate Production (FRP) lots for a total aircraft procurement of 175 production aircraft. An update to the acquisition strategy occurred in support of MS C that increased LRIP from two to four lots, with the total aircraft buy remaining at 175 production aircraft. A Dec 2017 USD(AT&L) Acquisition Decision Memorandum expanded LRIP to include Lot 5. Another Program Deviation Report was submitted on June 8, 2020, to declare a breach to the Full Rate Production Decision. A new APB dated October 19, 2020 was approved, and a new ADM dated October 20, 2020 re-designated Lots 6 through 9 as LRIP with the total aircraft buy remaining at 175 Production aircraft (+4 EMD aircraft for a grand total of 179 aircraft).

LRIP now consists of two Firm Fixed Price (FFP) and seven FFP Not to Exceed (NTE) options (LRIP-1 Qty 7, LRIP-2 Qty 12, LRIP-3 Qty 15, LRIP-4 Qty 18, LRIP-5 Qty 15, LRIP-6 Qty 12, and LRIP-7 Qty 15). This will be followed by four (Lots 10-13) FFP production options [via NTE values + Economic Price Adjustment (EPA)]. LRIP Lots 1 and 2 were awarded Aug 2016, LRIP Lot 3 was awarded Jan 2017, LRIP Lot 4 was awarded Sep 2018, LRIP Lot 5 was awarded Sep 2019, and LRIP Lots 6 and 7 were awarded Jan 2021. LRIP Lot 8 is planned for award in 2022.

The Aircrew Training System (ATS) acquisition strategy is to provide Aircrew Training Devices (ATDs), and associated support structure, to each Main Operating Base (MOB) and the Flying Training Unit (FTU). The ATS EMD FPIF contract with production options was conducted via a full and open competition per FAR Part 15, and awarded to FlightSafety Services Corporation in FY 2013. The ATS EMD phase will develop and procure ATDs; and will be supported with courseware, Training System Support Center, the technical data package, and support equipment to ensure system availability and concurrency with the aircraft. The first six ATS production options were exercised on 19 Aug 2015, 31 May 2017, 30 Apr 2018, 31 Mar 2019, 2 Sep 2020, and 4 Mar 2021. Lot 7 of 10 total lots is planned to be awarded in Sept 2022.

The Maintenance Training System (MTS) acquisition strategy is to acquire Maintenance Training Devices (MTDs), and associated support structure, for two AMC active duty Regional Maintenance Training Facilities. The MTS EMD FFP contract with production options was conducted via a full and open competition per FAR Part 15, and awarded to The Boeing Company in FY 2016. The MTS EMD phase will develop and procure MTDs; and will be supported with courseware, Training System Support Center, the technical data package, and support equipment to ensure system availability and concurrency with the aircraft.

The KC-46 Program is responsible for the development, testing, and production of a drogue-equipped, wing-mounted refueling system to meet Capability Production Document (CPD) thresholds and objectives for simultaneous refueling of two probe-equipped receivers. The system can be installed or removed from the KC-46 as mission needs dictate.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0401221F / *KC-46A Tanker Squadrons*	**Project (Number/Name)** 655271 / *KC-46 RDT&E*

The long-term support concept for the KC-46 is organic two-level maintenance (2LM): organization level (O-level) and depot level (D-level). For the purposes of this program, all maintenance other than O-level shall be referred to as D-level. The product support strategy will initially employ Interim Contractor Support (ICS) before transitioning to a 100% organically-managed maintenance and supply support capability. Performance Based Logistics (PBL) solutions will be evaluated during EMD as viable approaches to facilitate the transition.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0401221F / *KC-46A Tanker Squadrons*	Project (Number/Name) 655271 / *KC-46 RDT&E*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
KC-46A aircraft non-recurring development, integration, and testing; 4 RDT&E tanker aircraft; and support	SS/FPIF	The Boeing Company : Seattle, WA	5,143.540	2.328	Mar 2022	14.486	Apr 2022	53.994	Jan 2023	-		53.994	26.831	5,241.179	-
KC-46A Take Off and Landing Data (TOLD) Devlopment Cabilitity	SS/TBD	The Boeing Company : Seattle, WA	0.000	-		-		4.749	Apr 2023	-		4.749	36.576	41.325	-
KC-46A Aircrew Training System	SS/FPIF	Flight Safety Services Co : Centennial, CO	133.267	-		0.565	Aug 2022	9.869	May 2023	-		9.869	2.714	146.415	-
		Subtotal	5,276.807	2.328		15.051		68.612		-		68.612	66.121	5,428.919	N/A

Remarks

The KC-46 EMD contract was awarded 24 Feb 2011. The total cost represents the current Program Office Estimate (POE) which accounts for the ceiling price of the contract plus the financial and schedule risk of potential design changes for the KC-46 aircraft.

Target value is blank for the KC-46A aircraft category since the contract is fully funded. Target value is TBD for TOLD since it has not awarded yet. Target value is blank for the KC-46A Aircrew Training System category since the contract is fully funded.

FINANCIAL PERFORMANCE: The KC-46 is evaluated against traditional Research and Development (R&D) program expenditure benchmarks. Unlike many traditional R&D programs, the KC-46 EMD contract is a FPIF contract with progress payments. Twenty 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 health.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
KC-46A studies and analysis associated with the development, integration, and demonstration of KC-46 capability & future planning	C/CPAF	Various : Various	270.340	0.345	Sep 2021	9.326	Jun 2022	7.504	Jun 2023	-		7.504	1.426	288.941	-
		Subtotal	270.340	0.345		9.326		7.504		-		7.504	1.426	288.941	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0401221F / *KC-46A Tanker Squadrons*	Project (Number/Name) 655271 / *KC-46 RDT&E*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

These contracts are on an as needed basis, with various contract types and performing activities. Target value is blank since there are various contracts.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
KC-46A testing and planning support of development & operational test, FAA & military certification, and aircraft qualification activities	MIPR	418th FLTS : Edwards AFB, CA	228.964	17.933	Mar 2021	7.828	May 2022	45.803	Dec 2022	-		45.803	8.327	308.855	-
KC-46A Long Term Test Aircraft Maintenance Support	SS/CPAF	The Boeing Company : Edwards AFB, CA	11.413	9.248	Aug 2021	14.900	Apr 2022	-		-		-	0.000	35.561	46.636
		Subtotal	240.377	27.181		22.728		45.803		-		45.803	8.327	344.416	N/A

Remarks

Integrated testing and planning activities are performed by government organizations, with some contractor technical subject matter experts and teaming with the prime contractor. Target value is blank for the KC-46A testing and planning support of development & operational test because this is funding provided to government agencies.

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	5,787.524	29.854		47.105		121.919		-		121.919	75.874	6,062.276	N/A

Remarks

In FY2021, PE 0605221F KC-46, Project 655271 KC-46 RDT&E, and Project 651120 Pegasus Capability Improvements efforts were transferred to PE 401221F, Project 655271 KC-46 RDT&E, and Project 651120 Pegasus Capability Improvements in order to consolidate all KC-46 activity under a single PE. PE 0401221F also has historical Tanker Replacement costs from FY 2005-2008 reflected in prior years. PE 0605221F has costs from FY2009 to FY2020.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0401221F / *KC-46A Tanker Squadrons*	**Project (Number/Name)** 655271 / *KC-46 RDT&E*

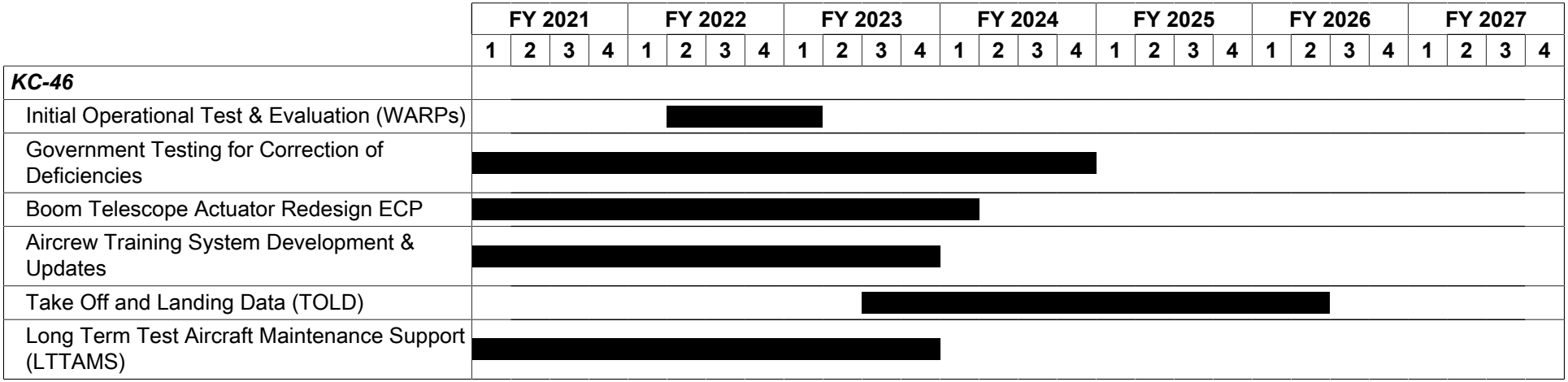

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0401221F / *KC-46A Tanker Squadrons*	**Project (Number/Name)** 655271 / *KC-46 RDT&E*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
KC-46				
Initial Operational Test & Evaluation (WARPs)	2	2022	1	2023
Government Testing for Correction of Deficiencies	1	2021	4	2024
Boom Telescope Actuator Redesign ECP	1	2021	1	2024
Aircrew Training System Development & Updates	1	2021	4	2023
Take Off and Landing Data (TOLD)	3	2023	2	2026
Long Term Test Aircraft Maintenance Support (LTTAMS)	1	2021	4	2023

Note

Events prior to Q1 2021 are reflected in PE 0605221F. Funding moved to PE 0401221F in FY 2021.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0401221F / *KC-46A Tanker Squadrons*	Project (Number/Name) 655KCY / *BA5 0401221F 655KCY KC-Y*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
655KCY: *BA5 0401221F 655KCY KC-Y*	0.000	0.000	0.000	11.281	0.000	11.281	19.305	93.448	192.058	106.566	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 5, PE 0401221F, project 655KCY, Support, is a new start.

A. Mission Description and Budget Item Justification

The KC-Y will provide the capability to fuel joint and coalition receivers via a boom or drogue system on every mission and will also augment the airlift fleet with cargo, passenger, and aeromedical evacuation capabilities. The KC-Y will operate in day/night and adverse weather conditions to enable deployment, employment, sustainment, and redeployment of U.S. joint, allied, and coalition forces. The KC-Y will have communication, navigation, and surveillance equipment for worldwide operations; the capability to perform missions in chemical and biological environments; the ability to operate in up to medium threat environments with self-defense/ protection (both active and passive) capabilities; and the necessary battlespace awareness to mitigate survivability threats.

The dynamics and mission urgency of the post-production (post-DD-250) environment require the program to maintain a flexible and responsive posture to support a broad range of mission support needs. The KC-Y will continue to identify, design, develop, integrate, verify, certify, produce, install, field, and sustain a comprehensive range of non-recurring and recurring post-production, air vehicle enhancements and field support needs. These needs may originate from programmed Mobility Air Force (MAF) requirements, Combatant Commander Joint or Urgent Operational Needs (JUON/UON), non-programmed Federal Aviation Administration (FAA) directives, requirements identified and supported by HHQ Enterprise Capability Collaboration Teams (i.e., High Value Airborne Asset [HVAA], Air Superiority 2030, and Multi-Domain Command and Control [MDC2]), or correction of field deficiencies.

The KC-Y will continue to develop, field, and sustain warfighter capabilities to meet evolving threats and mission support requirements through Block or discrete modification or modernization programs depending on mission urgency, available funding, and programmatic and technical risks. Post-production requirements can include, but will not be limited to: avionics and structural systems/ architecture and subsystem updates, general mission equipment updates and procurement, general sustainment support, studies and analyses, future Tanker requirements simulation and training, and correction of field deficiencies.

Project 655KCY funding will also support Program Support Costs (PSC) activities to include: market research, acquisition planning, pre-milestone activities, RFP development, test planning, mission planning capability development and various studies and analyses.

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 FY 2021 $0.000 million was expended for civilian pay expenses in this program element, and in FY 2022 $0.000 million is forecasted for civilian pay expenses in this program element.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0401221F / *KC-46A Tanker Squadrons*	**Project (Number/Name)** 655KCY / *BA5 0401221F 655KCY KC-Y*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Support	-	0.000	11.281	0.000	11.281
Description: Studies and analyses to support KC-Y planning activities for future initiatives, future tanker replacement planning, and other Program Office support to include by not limited to market research, acquisition planning, pre-milestone activities, RFP development, test planning, and various studies and analyses. ***FY 2022 Plans:*** N/A ***FY 2023 Base Plans:*** Market research, acquisition planning, pre-milestone activities, RFP development, test planning, and various studies and analyses for new KC-Y tanker development. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increased due to Special Program Office (SPO) stand-up activities to include marketing research, analysis, and studies.					
Accomplishments/Planned Programs Subtotals	-	0.000	11.281	0.000	11.281

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• APAF 02 KC-Y: *KC-Y Tanker Program*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1,300.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

The KC-Y acquisition strategy will be based on the approved CDD Annex, will be compliant with the FAR/DFARS, will emphasize competitiveness where practical and will seek to avoid a break in the continued tanker recapitalization plan consistent with the 2006 AOA.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0401221F / *KC-46A Tanker Squadrons*	**Project (Number/Name)** 655KCY / *BA5 0401221F 655KCY KC-Y*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Direct Cite Authority for Civ Pay	RO	Not specified. : TBD	0.000	-		-		4.000	Oct 2022	-		4.000	0.000	4.000	-
Direct MIssion Support	Various	Not specified. : TBD	0.000	-		-		7.281	Oct 2022	-		7.281	0.000	7.281	-
		Subtotal	0.000	-		-		11.281		-		11.281	0.000	11.281	N/A

Remarks

Target Value is blank for Direct Cite Authority for Civilian Pay since funds are provided to the center to fund manpower. Target value is blank for Direct Mission Support since there are various contracts.

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	-		-		11.281		-		11.281	0.000	11.281	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0401221F / *KC-46A Tanker Squadrons*	**Project (Number/Name)** 655KCY / *BA5 0401221F 655KCY KC-Y*

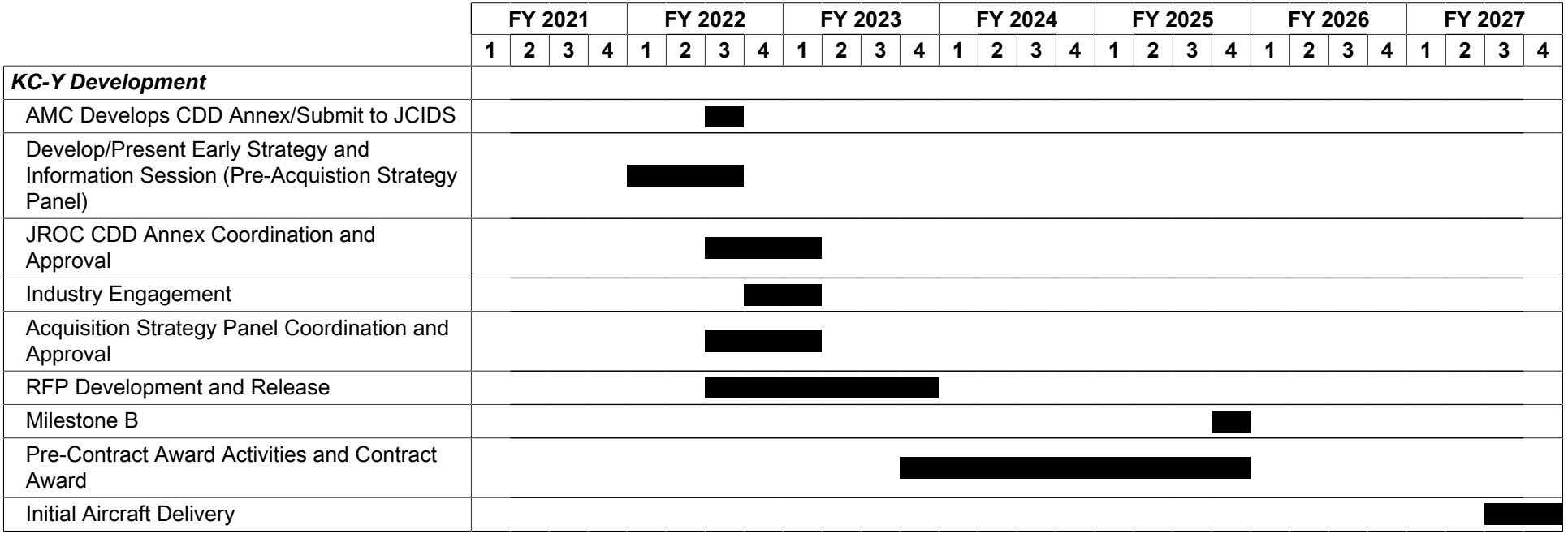

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0401221F / *KC-46A Tanker Squadrons*	**Project (Number/Name)** 655KCY / *BA5 0401221F 655KCY KC-Y*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
KC-Y Development				
AMC Develops CDD Annex/Submit to JCIDS	3	2022	3	2022
Develop/Present Early Strategy and Information Session (Pre-Acquistion Strategy Panel)	1	2022	3	2022
JROC CDD Annex Coordination and Approval	3	2022	1	2023
Industry Engagement	4	2022	1	2023
Acquisition Strategy Panel Coordination and Approval	3	2022	1	2023
RFP Development and Release	3	2022	4	2023
Milestone B	4	2025	4	2025
Pre-Contract Award Activities and Contract Award	4	2023	4	2025
Initial Aircraft Delivery	3	2027	4	2027

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0401319F / *VC-25B*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	2,510.681	720.155	655.665	492.932	0.000	492.932	372.856	161.028	20.359	0.000	0.000	4,933.676
655250: *VC-25B*	2,510.681	720.155	655.665	492.932	0.000	492.932	372.856	161.028	20.359	0.000	0.000	4,933.676
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Program MDAP/MAIS Code: 425												

Note

FY10-14 Prior Years Funding $27.29M was executed in PE 0401314F, BPAC 675355

A. Mission Description and Budget Item Justification

The VC-25B Program, formerly known as the Presidential Aircraft Recapitalization (PAR) Program, will replace the Presidential VC-25A fleet which faces capability gaps, rising maintenance costs, and parts obsolescence as it ages beyond 30 years. The VC-25B Program Office will deliver a new fleet of aircraft to meet the requirements for the President to execute the duties of Head of State, Chief Executive, and Commander-in-Chief. The VC-25B Program will uniquely modify two Boeing 747-8 commercial aircraft to provide the President, staff, and guests with safe and reliable air transportation with the equivalent level of communications capability and security available in the White House. The modifications to the 747-8 aircraft will include an electrical power upgrade with dual Auxiliary Power Units that are usable in flight, a mission communication system, a work and rest environment, an executive interior, military avionics, a self-defense system, independent enplaning and deplaning, and independent baggage loading. No significant changes to the existing VC-25A Concept of Operations or Concept of Employment are expected.

In August 2012, the Defense Acquisition Executive (DAE), as the VC-25B Milestone Decision Authority, approved the Materiel Development Decision. The Capability Development Document (CDD) was validated by the Joint Requirements Oversight Council in November 2014. In January 2015, the Secretary of the Air Force's Determination and Findings designated the Boeing 747-8 aircraft as the airframe platform, and the DAE's Acquisition Decision Memorandum authorized Pre-Milestone B (Pre-MS B) contracts aimed at improving affordability and reducing program execution risk. In February 2015, the Assistant Secretary of the Air Force for Acquisition approved a Justification and Approval designating Boeing as the sole source for Pre-MS B activities; and Post-MS B design, integration, modification, and test activities. The DAE approved the initial acquisition strategy in September 2015. MS B certification occurred in September 2016. In March 2017, the White House reaffirmed the minimum set of requirements necessary to meet Presidential mission needs; these requirements are codified in the March 2017 CDD. The DAE approved the updated acquisition strategy and the Acquisition Program Baseline (APB) in December 2018.

In April 2021 Boeing submitted an updated Integrated Master Schedule (IMS) and a formal request to extend aircraft contractual delivery dates by 12 months. In August 2021, Boeing submitted an updated request to the program office to extend aircraft contractual delivery dates by 17 months, upon updating their schedule risk assessment (SRA). This delay has resulted in an APB schedule program deviation for the remaining APB milestones (First Flight, Operational Test, Required Asset Availability (RAA) for Initial Operational Capability (IOC), and RAA for Full Operational Capability (FOC)). The APB schedule re-baseline is in staffing to the DAE for approval.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0401319F / *VC-25B*

This budget supports Post-MS B design, integration, modification, and test of two aircraft to make them Presidential mission ready. In FY21 and FY22, the program continued Engineering and Manufacturing development (EMD) activities to include modification, test planning, and initiation of Product Support (PS) activities. In FY23 the program will continue with EMD activities to include modification, test, and PS activities.

Funds may be used to lease test equipment, as well as address emerging and short-notice Diminishing Manufacturing Sources and Material Shortage (DMSMS) issues.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver VC-25B 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 FY 2021 $3.556 million was expended for civilian pay expenses in this program element, and in FY 2022 $4.200 million is projected for civilian pay expenses in this program element.

This program is in Budget Activity 5, System Development an Demonstration (SDD); however, it will not enter full rate production as stated below.

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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	799.429	680.665	0.000	0.000	0.000
Current President's Budget	720.155	655.665	492.932	0.000	492.932
Total Adjustments	-79.274	-25.000	492.932	0.000	492.932
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-25.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-50.600	0.000			
• SBIR/STTR Transfer	-28.674	0.000			
• Other Adjustments	0.000	0.000	492.932	0.000	492.932

Change Summary Explanation

FY 2021 funding was reduced by a total of $79.274 million which included a $50.600 million reprogramming action for higher Air Force priorities and $28.674 million for Small Business Innovation Research.

FY 2022 funding was reduced by $25.000 million due to a Congressional Directed Reduction for program delays.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0401319F / *VC-25B*

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY 2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: VC-25B EMD, Product Support, & Program Support Costs (PSC)	714.122	651.563	488.830
Description: Execute EMD activities and accomplish PSC to support the Program Office. FY22 will continue EMD activities such as the management, integration, modification, test planning, certification, and product support to deliver two Presidential mission-ready VC-25B Aircraft utilizing modeling and simulation, system integration labs (SILs), and mockups to assist in design/ modification. ***FY 2022 Plans:*** Funds in FY 2022 will continue EMD activities, aircraft modification, test planning and product support activities, as well as support PSC with transition from EMD activities to test planning, and the ramp up of product support activities. ***FY 2023 Plans:*** Funds in FY 2023 will continue EMD activities, aircraft modification, test and product support activities to include, but not limited to procurement of: initial spares, support equipment, aircraft familiarization training, technical order publications, and airworthiness directives. Continued support of PSC with transition to Developmental Test and Evaluation (DT&E) ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreased due to ramping down EMD activities, continued test planning, and transition to Developmental Test and Evaluation (DT&E).			
Title: VC-25B Government Test	6.033	4.102	4.102
Description: Government test activities to prepare for, oversee, and conduct test events. ***FY 2022 Plans:*** Funds in FY 2022 will be used for test planning with participating test organizations and contractors, and to plan for verification testing in SILs, contractor facilities and government facilities. ***FY 2023 Plans:*** Funds in FY 2023 will be used to prepare for and conduct aircraft functional checkout, as well as SIL, ground, and flight testing with the participating test organizations and contractors. ***FY 2022 to FY 2023 Increase/Decrease Statement:***			

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0401319F / *VC-25B*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Funding is consistent from FY22 to FY23 as the program continues the flight test planning stage and prepares for entry into checkout, ground and flight test.			
Accomplishments/Planned Programs Subtotals	720.155	655.665	492.932

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• OPAF 02 825990: *Materials Handling Vehicles*	0.000	0.251	0.000	-	0.000	-	-	-	-	0.000	0.251
• OPAF 03 837300: *Base Comm Infrastructure*	0.000	0.000	0.400	-	0.400	-	-	-	-	0.000	0.400
• OPAF 02 823990: *Special Purpose Vehicles*	0.499	2.319	3.190	-	3.190	-	-	-	-	0.000	6.008
• O&M O&M: PE 0401319F: *PAR Furnishings and Equipment*	1.951	-	-	-	-	-	-	-	-	0.000	1.951

Remarks

E. Acquisition Strategy

The Defense Acquisition Executive (DAE), as the VC-25B Milestone Decision Authority, approved the initial VC-25B Acquisition Strategy in September 2015. The DAE approved the updated VC-25B Acquisition Strategy and set the APB in December 2018. The VC-25B Program will integrate technologically mature subsystems into two Government furnished, commercial Boeing 747-8 aircraft. The VC-25B Program will design, integrate, modify, and test two aircraft to make them Presidential mission ready. Boeing is the prime integrator for VC-25B development activities. The VC-25B Program has a single sole-source firm-fixed-price contract with multiple major contract modifications. Modifications include risk reduction activities, 747-8 commercial aircraft purchase, Preliminary Design (PD), Engineering and Manufacturing Development (EMD), and Product Support. The contract for risk reduction activities was awarded in January 2016. The contract modification to purchase two commercial aircraft was awarded in August 2017. The contract modification for PD was awarded in September 2017. The contract modification for EMD was awarded in July 2018. The initial contract modification for Product Support activities was awarded in April 2020.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0401319F / *VC-25B*	Project (Number/Name) 655250 / *VC-25B*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
VC-25B EMD Contract Activities	SS/FFP	The Boeing Company : Various	2,453.334	603.537	Oct 2020	566.749	Oct 2021	383.846	Oct 2022	-		383.846	172.610	4,180.076	-
VC-25B Product Support Contract Activities	SS/FFP	The Boeing Company : Various	0.388	88.163	Oct 2020	64.441	Oct 2021	81.399	Oct 2022	-		81.399	242.150	476.541	-
		Subtotal	2,453.722	691.700		631.190		465.245		-		465.245	414.760	4,656.617	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Direct Cite Authority Civilian Pay	Various	AFLCMC/WV : WPAFB, OH	5.813	3.556	Nov 2020	4.200	Oct 2021	4.541	Oct 2022	-		4.541	7.433	25.543	-
		Subtotal	5.813	3.556		4.200		4.541		-		4.541	7.433	25.543	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
VC-25B Developmental Test and Evaluation	MIPR	412 TW, JITC : Various	5.371	6.033	Dec 2020	4.102	Dec 2021	4.102	Oct 2022	-		4.102	34.550	54.158	-
		Subtotal	5.371	6.033		4.102		4.102		-		4.102	34.550	54.158	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
VC-25B Program Support Costs - Other Government Costs	Various	AFLCMC/WV : WPAFB, OH	23.295	3.871	Nov 2020	7.297	Nov 2021	7.091	Nov 2022	-		7.091	88.040	129.594	-
VC-25B Program Support Costs- Contract Services	C/T&M	AFLCMC/WV : WPAFB, OH	22.480	14.995	Feb 2021	8.876	Feb 2022	11.953	Feb 2023	-		11.953	9.460	67.764	-
		Subtotal	45.775	18.866		16.173		19.044		-		19.044	97.500	197.358	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0401319F / *VC-25B*	Project (Number/Name) 655250 / *VC-25B*	

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	2,510.681	720.155		655.665		492.932		-		492.932	554.243	4,933.676	N/A

Remarks

FY 2010-2014 RDT&E Funding ($27.3M) was executed in PE 0401314F, Project 675355, BA07.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0401319F / *VC-25B*	**Project (Number/Name)** 655250 / *VC-25B*

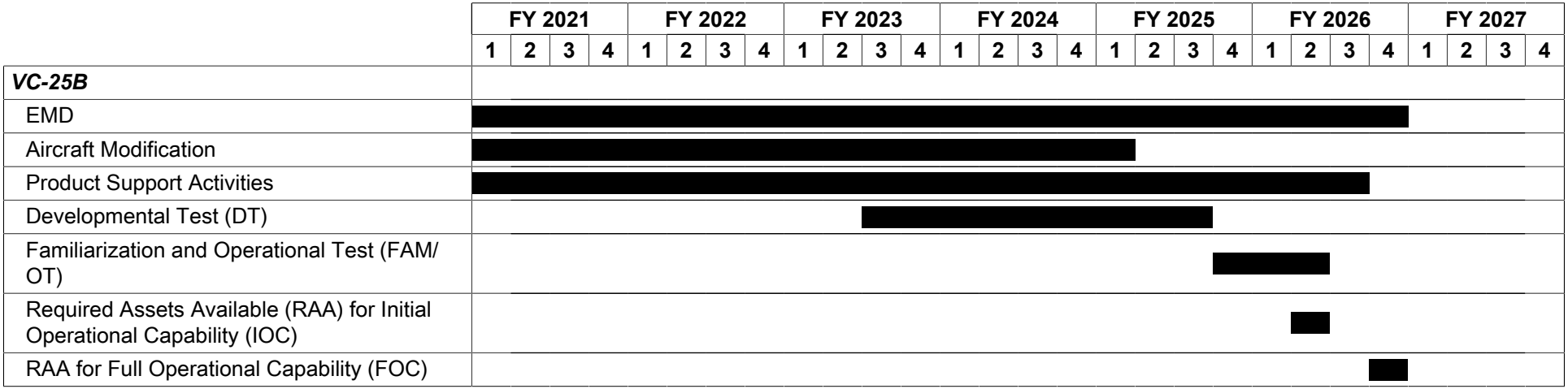

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0401319F / *VC-25B*	**Project (Number/Name)** 655250 / *VC-25B*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
VC-25B				
EMD	1	2021	4	2026
Aircraft Modification	1	2021	1	2025
Product Support Activities	1	2021	3	2026
Developmental Test (DT)	3	2023	3	2025
Familiarization and Operational Test (FAM/OT)	4	2025	2	2026
Required Assets Available (RAA) for Initial Operational Capability (IOC)	2	2026	2	2026
RAA for Full Operational Capability (FOC)	4	2026	4	2026

Note

EMD, Aircraft Modification, and Product Support Activities all began prior to Q1 2021.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0701212F / *Automated Test Systems*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	12.418	15.445	16.664	0.000	16.664	0.000	25.538	34.329	35.092	Continuing	Continuing
6506TE: *Test And Evaluation Support Budget Authority*	-	12.418	15.445	16.664	0.000	16.664	0.000	25.538	34.329	35.092	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Program MDAP/MAIS Code: 6506												

A. Mission Description and Budget Item Justification

The Automatic Test Systems (ATS) program office is responsible for developing, acquiring, delivering and sustaining ATS war-fighting capabilities for the United Stated Air Force (USAF). ATS is responsible for developing, modernizing, acquiring, and sustaining ATS to meet the user's operational needs.

ATS Product Group consists of the following:
Armament and Stores
Avionics
Electronic Warfare
Software Loader/Verifier and Built-in-Test
Radar and Identification Friend or Foe
Specialized

Development, modernization and technology insertion for over 8K testers across all major commands and Joint Force. Accelerates developing and modernizing cyber-resilient, nuclear-certified ATS supporting USAF Armament, Bomber, Fighter/Advance Aircraft, Mobility, Training, ISR & SOF.

The Bomber Armament Tester (BAT) is replacing six legacy testers and combining their capabilities into one tester. The Bomber Armament Tester will support the B-2, B-1 and B-52 platforms. It will ensure the USAF bomber fleet can conduct nuclear deterrence, global power projection and global strike operations to support the President of the United States and Combatant Commanders by providing a reliable, cyber secure, and sustainable tester. The tasks are to develop a common bomber armament tester and the Test Program Sets (Software, Hardware, and Documentation) to test the armament release equipment on the bombers.

RDT&E efforts support development, testing, and producibility of the Bomber Armament Tester and Test Program Sets. The program will utilize an incremental development approach with B-2 as Increment 1, B-1 as Increment 2, and B-52 as Increment 3.

The Common Aircraft Portable Reprogramming Equipment (CAPRE) Secure Memory Loader Verifier (SMLV) loads operational flight programs to the weapon systems. CAPRE SMLV leads the fleet on Cyber initiatives and is government owned and developed. CAPRE SMLV supports 45 Mission Design Series (MDS) including but not limited to A-10, B-1, B-52, C-5, C-17, C-130, CV-22, F-15, F-16, H-60 and KC-46.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0701212F / *Automated Test Systems*

This RDT&E effort includes developing a Network Interface Module (NIM) that provides additional cyber hardening to the CAPRE system and redesigning the current CAPRE system to adapt to the NIM. Additionally this RDT&E effort includes software development for NIM interfaces and new weapons systems moving to the CAPRE system from other MLV systems. The goal is to provide one common cyber secure MLV for the Air Force to minimize cyber vulnerabilities in weapon systems.

RDT&E efforts support prototype development and testing of the Common Armament Tester Fighter and Test Program Sets.

This program element also includes program administrative cost for the Automatic Test Systems program office and funds the cost of studies and research to support the Automatic Test Systems fleet.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Automatic Test Systems Program Office 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. In FY21 0.000M was expended, and in FY22 0.000M is forecast 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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	10.654	15.445	0.000	0.000	0.000
Current President's Budget	12.418	15.445	16.664	0.000	16.664
Total Adjustments	1.764	0.000	16.664	0.000	16.664
• 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	1.764	0.000	16.664	0.000	16.664

Change Summary Explanation

No significant changes

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Bomber Armament Tester	10.029	4.438	0.000	0.000	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0701212F / *Automated Test Systems*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Description: New Common Bomber Armament Tester for B-1, B-2, and B-52. RDT&E efforts support development, testing, and producibility of the Bomber Armament Tester and Test Program Sets. ***FY 2022 Plans:*** RDT&E efforts supporting development, testing, and producibility of the Bomber Armament Tester and Test Program Sets. ***FY 2023 Base Plans:*** N/A ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Development planned to be completed					
Title: Common Aircraft Portable Reprogramming Equipment (CAPRE) ***Description:*** Development of a common cyber secure Memory Loader Verifier for the Air Force. ***FY 2022 Plans:*** FY21/22 3600 RDT&E funds needed to complete the development of the CAPRE SMLV that allows secure transfer of operational flight program (OFP) on 32 supported aircraft. This includes software development and interfaces for the CAPRE SMLV. Funds are also needed to continue the development efforts and all costs associated with the development of this program, which is phased and funded incrementally. ***FY 2023 Base Plans:*** Funding will be utilized for approximately 200 air adapter groups (AAG) that will allow the 18 platforms currently utilizing CAPRE legacy to transition over to utilizing CAPRE SMLV system. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:***	2.389	11.007	16.664	0.000	16.664

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0701212F / *Automated Test Systems*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Increase in requirement					
Accomplishments/Planned Programs Subtotals	12.418	15.445	16.664	0.000	16.664

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• APAF 07 00071: *Replacement Support Equipment*	27.311	27.392	23.677	-	23.677	19.182	23.948	-	-	0.000	121.510

Remarks

Other program funding includes procurement funds for Bomber Armament Tester Program, the Common Aircraft Portable Reprogrammable Equipment Secure Memory Loader Verifier and Aircraft Smart Weapons Test Set (ASWTS).

E. Acquisition Strategy

Acquisition Strategy for ATS modernization and technology insertion projects are evaluated for priority, feasibility, Return on Investment, and cost then sorted into Tiers for ease of classification:

Tier I: Stars-Highest priority projects that are both achievable and provide significant benefits to the Air Force.
•Tier II: Rising Stars-Projects that are high priority, meet modernization goals, and will deliver needed capabilities.
•Tier III: Innovation Opportunities-Low TRL projects that require small investments to begin development.
•Tier IV: Sustainment Efforts-Lower cost efforts targeted at improving existing systems. Typically sustaining engineering funds (583), rather than R&D funds (3600)
•Tier V: Watch List-Low priority and/or immature concepts that require significant investment or technology development

Acquisition Strategy for the Bomber Armament Tester (BAT) was approved by AFPEO/ Agile Combat Support on 12 November 2015. The BAT program will use an incremental approach based on customer needs to satisfy this requirement. Increment 1 includes the development of the core test set, the B-2A requirements and development of the most complex B-1B and B-52 test program sets. Increment 2 consist of the B-1B development and Increment 3 consists of the B-52H requirements. The BAT program will utilize full and open competition to award the contract. Contract awarded September 28, 2017.

The Acquisition strategy for Common Aircraft Portable Reprogrammable Equipment (CAPRE) Secure Memory Loader Verifier (SMLV) is to use the original government manufacturer to develop the NIM, software and hardware development. Acquisition Strategy for CAPRE was approved by the Milestone Decision Authority in June 2017.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0701212F / *Automated Test Systems*	**Project (Number/Name)** 6506TE / *Test And Evaluation Support Budget Authority*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	C/CPAF	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-
CAPRE/CAPRE SMLV Development	PO	309th OO-ALC : UT	-	2.389	Jan 2021	-		16.664	Nov 2023	-		16.664	Continuing	Continuing	-
BAT Development / Cost Overruns	C/CPAF	Not specified. : CA	-	10.029	Oct 2020	3.450	Oct 2021	-		-		-	Continuing	Continuing	-
		Subtotal	-	12.418		3.450		16.664		-		16.664	Continuing	Continuing	N/A

Remarks

Product Development Cost include all ATS modernization and technology insertion to include but not limited to the development of the Bomber Armament Test Sets (Units under test Software, hardware and Technical Data), Technical Data and maintenance of Government Furnished Equipment.

Development efforts include developing a Network Interface Module (NIM) that provides additional cyber hardening to the CAPRE system and redesigning the current CAPRE system to adapt to the NIM. Development effort also include software development for NIM interfaces and new weapons systems moving to the CAPRE system from other MLV systems. The goal is to provide one common cyber secure MLV for the Air Force.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	C/CPAF	Not specified. : TBD	-	-		3.062	Oct 2021	-		-		-	Continuing	Continuing	-
Development and Operation Testing support	C/CPIF	Not specified. : NV	-	-		8.933	Oct 2021	-		-		-	Continuing	Continuing	-
		Subtotal	-	-		11.995		-		-		-	Continuing	Continuing	N/A

Remarks

Test and Evaluation Cost include all ATS modernization and technology insertion to include but not limited to the environmental testing of the Bomber Armament Tester and operational testing of the test program sets for the B-2 and most complex B-1 and B-52.

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	12.418		15.445		16.664		-		16.664	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0701212F / *Automated Test Systems*	Project (Number/Name) 6506TE / *Test And Evaluation Support Budget Authority*	

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0701212F / *Automated Test Systems*	**Project (Number/Name)** 6506TE / *Test And Evaluation Support Budget Authority*

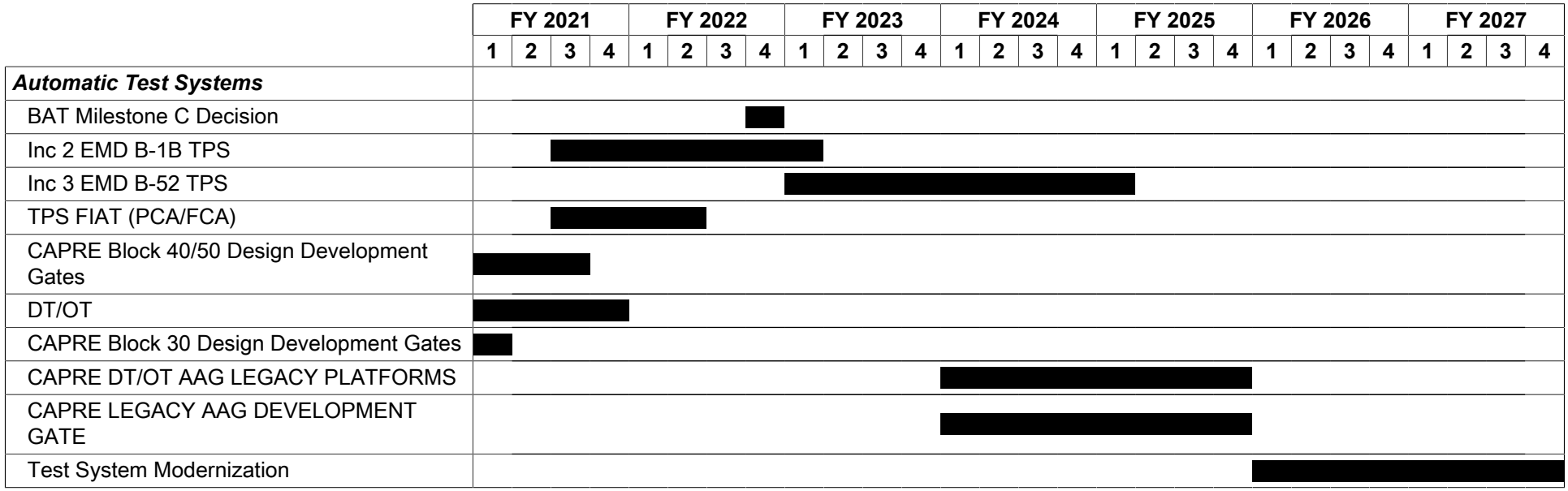

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0701212F / *Automated Test Systems*	**Project (Number/Name)** 6506TE / *Test And Evaluation Support Budget Authority*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Automatic Test Systems				
BAT Milestone C Decision	4	2022	4	2022
Inc 2 EMD B-1B TPS	3	2021	1	2023
Inc 3 EMD B-52 TPS	1	2023	1	2025
TPS FIAT (PCA/FCA)	3	2021	2	2022
CAPRE Block 40/50 Design Development Gates	1	2021	3	2021
DT/OT	1	2021	4	2021
CAPRE Block 30 Design Development Gates	1	2021	1	2021
CAPRE DT/OT AAG LEGACY PLATFORMS	1	2024	4	2025
CAPRE LEGACY AAG DEVELOPMENT GATE	1	2024	4	2025
Test System Modernization	1	2026	4	2027

Note

Bomber Armament Tester (BAT) is a nuclear certified common tester capable of testing on-aircraft Stores Management Systems and Line Replacement Units both on- and off-aircraft. The BAT System will test functionality of the Armament Mission Equipment (AME) that is required for B-2A, B-1B, and B-52H weapons delivery. The BAT schedule reflects Increments I, II, AND III. Due to an increase in material cost and lack of access to needed Government Furnished Property (GFP) to the Original Equipment Manufacturer (OEM), the BAT program is experiencing major schedule delays which is causing the program to overrun the projected cost. Program re-baselined at the beginning of FY21 to stabilize program costs and schedule.

FY22 funds will be used for Engineering & Manufacture Design (EMD) phases for Increments I, II, and III. Without FY22 3600 funding, EMD and integration will be stopped, and BAT development and integration will be further delayed.

The Common Aircraft Portable Reprogramming Equipment (CAPRE) Secure Memory Loader Verifier (SMLV) a is government designed and developed memory loader verifier (MLV) to replace the aging F-16 unique MLV and legacy CAPRE equipment. FY22 funds will be used for Engineering & Manufacture Design (EMD) of the CAPRE SMLV to ensure a cyber-secure MLV to maximize readiness for 18 platforms.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0804772F / *Training Developments*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	4.471	2.482	15.138	0.000	15.138	7.942	8.037	8.142	8.259	Continuing	Continuing
652400: *Training Developments*	-	4.471	2.482	7.831	0.000	7.831	7.942	8.037	8.142	8.259	Continuing	Continuing
652401: *AETC Transformational Education and Training*	-	0.000	0.000	7.307	0.000	7.307	0.000	0.000	0.000	0.000	Continuing	Continuing

Note

This program, BA 5, PE 0804772F, project 652401, Air Mobility Fundamentals, is a new start.

A. Mission Description and Budget Item Justification

No mission description provided.

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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	4.471	4.482	0.000	0.000	0.000
Current President's Budget	4.471	2.482	15.138	0.000	15.138
Total Adjustments	0.000	-2.000	15.138	0.000	15.138
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-2.000			
• 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	15.138	0.000	15.138

Change Summary Explanation

Congressional Directed reduction for underexecution.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0804772F / *Training Developments*	Project (Number/Name) 652400 / *Training Developments*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
652400: *Training Developments*	-	4.471	2.482	7.831	0.000	7.831	7.942	8.037	8.142	8.259	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Pilot Training Next (PTN) offers a more effective approach to pilot training. New training technologies will be studied and validated. Results will be used by Air Education and Training Command to develop processes and procedures to increase pilot production, improve and streamline existing training programs, and to incorporate into other programs.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver PTN weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F.

Alignment to the NDS: PTN is part of a complete redesign of pilot training using cutting edge technology to provide a faster, more cost effective and more comprehensive training model to get the warfighter to the cockpit in half the time of the existing model.

Funding contained in this documentation directly aids Air Education and Training Command's flying training enterprise to continue its overall Future Years Defense Program pilot production increase starting in FY 2020, thus reducing the USAF Pilot Shortage.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Pilot Training Next (PTN) Development	4.471	2.482	7.831
Description: Pilot Training Next currently utilizes eight (8) T-6B aircraft equipped with heads-up and advanced situational awareness displays. Mission computers were temporarily modified to enable Air-to-Air and Air-to-Ground simulated weapons delivery. Numerous Virtual Reality (VR) Immersive Training Devices (ITDs) are also being utilized in the training curriculum. The aircraft and VR ITDs enable proper assessment of advanced pilot training concepts, techniques, procedures, and capabilities, while also providing a flexible architecture that incorporates Live, Virtual, and Constructive (LVC)elements into undergraduate pilot training. Efforts will be focused on validating new LVC and VR ITD concepts to develop processes and procedures to increase pilot production, improve and streamline existing undergraduate pilot training programs.			
FY 2022 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0804772F / *Training Developments*	**Project (Number/Name)** 652400 / *Training Developments*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Continue development of T-6A avionics modifications as it relates to real-time data capture and advanced competency instruction within PTN. Continue experimentation with the T-6B aircraft configured in the Textron BP2+ software package. Further refine VR ITD capabilities. ***FY 2023 Plans:*** Continue development of PTN. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.			
Accomplishments/Planned Programs Subtotals	4.471	2.482	7.831

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Program Office(s) will select their own acquisition strategies based on Air Education and Training Command's innovation unit (Detachment 24) requirements. The initial systems PTN is primarily focused on are small-scale avionics modifications to the T-6A aircraft and incorporating Virtual Reality Immersive Training Devices into the undergraduate pilot training curriculum.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0804772F / *Training Developments*	Project (Number/Name) 652400 / *Training Developments*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Pilot Training Next Contracts	Various	AFLCMC : TBD	-	3.121	Jun 2021	1.111	Jun 2022	6.460	Apr 2023	-		6.460	Continuing	Continuing	-
		Subtotal	-	3.121		1.111		6.460		-		6.460	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Pilot Training Next Test Activities	TBD	TBD : TBD	-	0.150		0.152		0.152		-		0.152	Continuing	Continuing	-
		Subtotal	-	0.150		0.152		0.152		-		0.152	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Administrative Support	TBD	Not specified. : TBD	-	0.450	Jan 2021	0.457	Jan 2022	0.457	Oct 2022	-		0.457	Continuing	Continuing	-
Administrative and Advisory Services Support	TBD	Not specified. : TBD	-	0.650	Mar 2021	0.660	Mar 2022	0.660	Oct 2022	-		0.660	Continuing	Continuing	-
Government Travel	Various	Not specified. : TBD	-	0.100	Jan 2021	0.102	Jan 2022	0.102	Oct 2022	-		0.102	Continuing	Continuing	-
		Subtotal	-	1.200		1.219		1.219		-		1.219	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	4.471		2.482		7.831		-		7.831	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0804772F / *Training Developments*	**Project (Number/Name)** 652400 / *Training Developments*

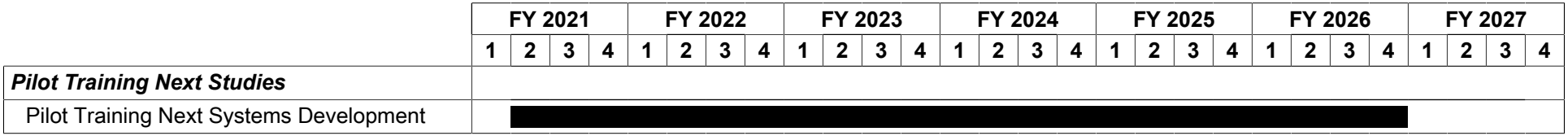

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0804772F / *Training Developments*	**Project (Number/Name)** 652400 / *Training Developments*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Pilot Training Next Studies				
Pilot Training Next Systems Development	2	2021	4	2026

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0804772F / *Training Developments*	Project (Number/Name) 652401 / *AETC Transformational Education and Training*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
652401: *AETC Transformational Education and Training*	-	0.000	0.000	7.307	0.000	7.307	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 5, PE 0804772F, project 652401, Air Mobility Fundamentals, is a new start.

A. Mission Description and Budget Item Justification

The Mobility Pilot Production Fundabmentals simulator provides stop-gap training for the Mobility Pilot production while the T-1 divests. Air Mobility Fundamentals is a prep course, allowing FTU manning to teach both this simulator and flying courses.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Air Mobility Fundamentals	-	-	7.307
Description: The Mobility Pilot Production Fundabmentals simulator provides stop-gap training for the Mobility Pilot production while the T-1 divests. Air Mobility Fundamentals is a prep course, allowing FTU manning to teach both this simulator and flying courses. ***FY 2023 Plans:*** Develop Air Mobility Fundamentals prep course. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The is new start.			
Accomplishments/Planned Programs Subtotals	-	-	7.307

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Program Office(s) will select their own acquisition strategies based on Air Education and Training Command's innovation unit (Detachment 24) requirements.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0804772F / *Training Developments*	**Project (Number/Name)** 652401 / *AETC Transformational Education and Training*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Mobility Fundamentals	TBD	AETC : TBD	-	-		-		7.307	Apr 2023	-		7.307	Continuing	Continuing	-
		Subtotal	-	-		-		7.307		-		7.307	Continuing	Continuing	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		-		7.307		-		7.307	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0804772F / *Training Developments*	**Project (Number/Name)** 652401 / *AETC Transformational Education and Training*

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
No project title.																												
No event title.									[redacted]																			

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0804772F / *Training Developments*	**Project (Number/Name)** 652401 / *AETC Transformational Education and Training*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
No project title.				
No event title.	1	2023	4	2023

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0901299F / *AF A1 Systems*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	7.453	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.453
650007: *The Inspector Generals Instructional and Informational Readiness System (TIGIIRS)*	-	7.453	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.453
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The DAF Inspector General Instructional and Informational Readiness System Next Generation (TIGIIRS NG) system will develop a single, standardized and integrated process for planning, executing, reporting & analyzing Wing Performance and Readiness. It enables the IG to efficiently accomplish 10USC8020 responsibility to "report upon the discipline, efficiency and economy of the Air Force" and those responsibilities directed by SecAF & CSAF in Readiness Review Task #26.

The legacy capability is built upon a MAJCOM-generated architecture that was transitioned to a program of record in FY10 as an interim gapping solution. This funding provides for the development foundation of the Next Gen System.

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 $0.000M was expended for civilian pay expenses in this program element, and in CY $0.000M 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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force					Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*		**R-1 Program Element (Number/Name)** PE 0901299F / *AF A1 Systems*			
B. Program Change Summary ($ in Millions)	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**
Previous President's Budget	7.453	0.000	0.000	0.000	0.000
Current President's Budget	7.453	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 2021	FY 2022	FY 2023
Title: Develop The Inspector Generals Instructional and Informational Readiness Next Generation (TIGIIRS NG) system	7.453	0.000	0.000
Description: Funds will be used to develop a foundation for the TIGIIRS NG system ***FY 2022 Plans:*** N/A ***FY 2023 Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	7.453	0.000	0.000

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

The DAF Inspector General Instructional and Informational Readiness System Next Generation (TIGIIRS NG) system will provide a single, standardized and integrated process for planning, executing, reporting & analyzing Wing Performance and Readiness.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0901299F / *AF A1 Systems*

The legacy capability is built upon a MAJCOM-generated architecture that was transitioned to a program of record in FY10 as an interim gapping solution. The legacy system is not sustainable beyond FY24. This funding provides for the development of a foundation for TIGIIRS NG.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0901299F / *AF A1 Systems*	Project (Number/Name) 650007 / *The Inspector Generals Instructional and Informational Readiness System (TIGIIRS)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Capability Development	SS/CPFF	Various : Various	-	5.836	Mar 2022	-		-		-		-	Continuing	Continuing	-
Direct Mission Support	Various	Various : Various	-	0.894	Jan 2022	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	6.730		-		-		-		-	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Support Costs	Various	AFLCMC/HI : WPAFB, OH	-	0.723	Jan 2022	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	0.723		-		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	7.453		-		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0901299F / *AF A1 Systems*	**Project (Number/Name)** 650007 / *The Inspector Generals Instructional and Informational Readiness System (TIGIIRS)*

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
The IG Instructional & Informational Readiness System (TIGIIRS NG)																												
Capability Development																												

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0901299F / *AF A1 Systems*	**Project (Number/Name)** 650007 / *The Inspector Generals Instructional and Informational Readiness System (TIGIIRS)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
The IG Instructional & Informational Readiness System (TIGIIRS NG)				
Capability Development	2	2022	4	2022

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 1206442F / *Next Generation OPIR*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	0.000	0.000	0.148	0.000	0.148	0.160	0.162	0.164	0.172	Continuing	Continuing
657121: *Next-Gen OPIR Space, Block 0 Polar*	-	0.000	0.000	0.148	0.000	0.148	0.160	0.162	0.164	0.172	Continuing	Continuing

A. Mission Description and Budget Item Justification

In FY 2021, PE 1206442F, Next Generation OPIR efforts were transferred to Appropriation 3620, Research, Development, Test & Evaluation, Space Force, PE 1206442SF, Next Generation OPIR from Appropriation 3600, Budget Activity 05 due to the creation of a new Appropriation for Space Force.

The Next-Generation Overhead Persistent Infrared (Next-Gen OPIR) RDT&E FY 2021 budget justification exhibits describe the Next-Gen OPIR Space, Ground, and Space Modernization Initiative (SMI) programs.

1. Next-Gen OPIR Space Modernization Initiative (SMI) (Project 657009): SMI supports Next-Gen OPIR by assessing and demonstrating new technologies better enabling the detection of emerging global missile threats, material obsolescence, designing space and ground modifications focused on affordability and capability,and maximizing the effectiveness of existing system data products. SMI funds engineering activities to reduce both production and future system costs through manufacturing and producibility enhancements, and technology insertion. SMI will also mature potential technology upgrades at the component and system level for space and ground architecture enhancements. SMI includes studies and risk reduction activities to evolve the current Program of Record (PoR) constellation, reduce production timelines, and reduce recurring production costs. SMI activities are balanced and phased to enable an expanded trade space and improve the competitive environment. The three major thrust areas under SMI are Demonstrations, Technology Maturation and Data Exploitation. The Demonstrations mature and demonstrate technologies with ground and on-orbit prototypes. Demonstrations advance system performance and algorithms for tactical and strategic applications to enhance PoR capabilities. Finally, demonstrations reduce program risks for future OPIR systems, whether new systems or evolutions of the current PoR. Technology Maturation assesses and addresses needs to support resiliency of PoR assets and future architectures that must respond to an evolving threat environment. Data Exploitation enables access to OPIR data sources to expand technical intelligence and battlespace awareness processing and data dissemination tools to support warfighters and other data users.

2. Next-Gen OPIR Ground (Project 657106): Next-Gen OPIR Ground, also known as Future Operationally Resilient Ground Evolution (FORGE), will consist of Command and Control (C2) migration to Air Force Space Command's (AFSPC) Enterprise Ground Services (EGS), modernization of Mission Data Processing (MDP) to implement an open framework, and required development and/or upgrades to Relay Ground Stations (RGS) to meet AFSPC guidance on the current and future space domain demands. FORGE and EGS efforts combined 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. EGS will introduce common ground services such as Telemetry, Tracking and Command (TT&C), mission management, and automation. To support initial Next-Gen OPIR Space satellite launches without driving risks into the FORGE development schedule, the program will establish a risk reduction ground Next-Gen OPIR Interim Operations (NIO) capability based on a limited SBIRS Block 20 solution that can be utilized if FORGE becomes delayed.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 1206442F / *Next Generation OPIR*

3. Next-Gen OPIR Space: Is a transition from the legacy SBIRS program. Next-Gen OPIR implements the direction of the Joint Requirements Oversight Council Memorandum (JROCM) 130-17, dated 21 December 2017, by developing the next generation of strategically survivable space-based missile warning OPIR platforms in both GEO and Polar orbits. This program will deliver improved core missile warning capabilities that are more survivable against emerging threats. The full Next-Gen OPIR constellation will consist of a minimum of GEO and Polar satellites in sufficient number to meet global warning coverage with no exploitable holes (5 GEO + 2 Polar) plus required backup and attrition and reconstitution reserve. The Air Force intends to acquire Next-Gen systems in block procurements. The Block 0 acquisition strategy consists of three GEO and two Polar satellites. The first GEO satellite is required no later than FY 2025 and the first Polar satellite is required in FY2027. All five Block 0 satellites need to be on orbit by FY2029. Follow-on blocks will be addressed in future acquisition strategies. Next-Gen OPIR Space, Block 0 Geosynchronous Earth Orbit (GEO)(NGG) (Project 657120): The Program Office intends to acquire the NGG capability in two contract actions. Phase 1 was awarded in August 2018 and encompasses requirements analysis, design/development, critical path flight hardware procurement, and risk reduction efforts leading to a System CDR. Phase 2 will be awarded in FY2021 for the manufacturing, assembly, system integration and test, launch and early on-orbit test through the delivery of NGG satellites 1-3 for operational acceptance of each space vehicle.

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 May 2020, encompasses design and development, critical path flight hardware procurement, and risk reduction efforts leading to a System Critical Design Review (CDR) in FY 2025. Phase 2 will be awarded in FY 2025 for the manufacturing, assembly, integration and test, and early on orbit test, through operational acceptance of NGP satellites 1 and 2.

Next-Gen OPIR Space, Block 1 (Project 657122): The Air Force plans to acquire subsequent blocks in a competitive environment. The Block 1 satellites will be based on the Enterprise OPIR Capability Development Document (CDD), validated by the Joint Requirements Oversight Council (JROC) in May 2019. The Next Gen OPIR Block 1 program acquisition will begin in FY 2023 in time to deliver its first satellite by FY 2030.

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

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 1206392F and 1206398F.

This program is in Budget Activity 5, System Development and Demonstration (SDD) because the majority of Projects under PE 1206442F have been declared Section 804 Rapid Prototype efforts conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full rate production.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force					Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 1206442F / *Next Generation OPIR*		
B. Program Change Summary ($ in Millions)	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	0.148	0.000	0.148
Total Adjustments	0.000	0.000	0.148	0.000	0.148
• 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	0.148	0.000	0.148

Change Summary Explanation

FY 2020: +$75M Congressional plus-up to support Next-Gen OPIR Space, Block 0 GEO to support 2025 launch timeline of first SV.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 1206442F / *Next Generation OPIR*	Project (Number/Name) 657121 / *Next-Gen OPIR Space, Block 0 Polar*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
657121: *Next-Gen OPIR Space, Block 0 Polar*	-	0.000	0.000	0.148	0.000	0.148	0.160	0.162	0.164	0.172	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In FY 2021, PE 1206442F, Next Generation OPIR efforts were transferred to Appropriation 3620, Research, Development, Test & Evaluation, Space Force, PE 1206442SF, Next Generation OPIR from Appropriation 3600, Budget Activity 05 due to the creation of a new Appropriation for Space Force.

Next-Generation Overhead Persistent Infrared (OPIR) Space, Block 0 Polar (NGP) (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 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 May 2020, encompasses design and development, critical path flight hardware procurement, and risk reduction efforts leading to a System Critical Design Review (CDR) in FY 2025. Phase 2 will be awarded in FY 2025 for the manufacturing, assembly, integration and test, and early on orbit test, through operational acceptance of NGP satellites 1 and 2.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Next-Gen OPIR Space, Block 0 Polar	0.000	0.000	0.148
Description: Development of the Next-Gen OPIR Polar 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 Next-Gen OPIR Polar satellites in a resilient architecture, providing real time persistent infrared coverage of the northern hemisphere.			
FY 2022 Plans: N/A			
FY 2023 Plans: Continue development of the Next-Gen OPIR Polar missile warning satellites.			
FY 2022 to FY 2023 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 1206442F / *Next Generation OPIR*	**Project (Number/Name)** 657121 / *Next-Gen OPIR Space, Block 0 Polar*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Continue develepment			
Accomplishments/Planned Programs Subtotals	0.000	0.000	0.148

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Space Force intends to acquire Next-Gen systems in block developments to deliver the required constellation. The first block, Block 0, consists of three Next-Gen Geosynchronous Earth Orbit (GEO) and two Next-Gen Polar satellites. The Next-Gen OPIR Space program has been declared a Section 804 Rapid Prototype effort under the 2016 National Defense Authorization Act (NDAA). The first GEO satellite is required by FY 2025, and the first Polar satellite is required in FY 2027. The program office awarded two sole source contracts (one to a GEO prime and one to a Polar prime) under the authority of two Justification & Authorization documents. The Next-Gen Polar 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, development, critical path flight hardware procurement, and risk reduction efforts leads to a System CDR in FY 2025 for Next-Gen Polar Satellite Vehicles (SV) 1 and 2. Phase 2 will be awarded in FY 2025, encompassing build, integration, test, launch, and transition to operations for Next-Gen Polar SVs 1 and 2. The Space Force plans to acquire subsequent blocks in a competitive environment. The Block 1 satellites will be based on the Missile Warning and Missile Defense OPIR Capability Development Document (CDD), validated by the Joint Requirements Oversight Council (JROC) in May 2019.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 1206442F / *Next Generation OPIR*	**Project (Number/Name)** 657121 / *Next-Gen OPIR Space, Block 0 Polar*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FFRDC	RO	Aerospace Corp. : El Segundo, CA	-	-		-		0.148		-		0.148	0.000	0.148	-
A&AS	Various	Various : Various	-	-		-		-		-		-	0.000	0.000	-
Other Support	Various	Various : Various	-	-		-		-		-		-	0.000	0.000	-
		Subtotal	-	-		-		0.148		-		0.148	0.000	0.148	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		-		0.148		-		0.148	0.000	0.148	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 1206442F / *Next Generation OPIR*	**Project (Number/Name)** 657121 / *Next-Gen OPIR Space, Block 0 Polar*

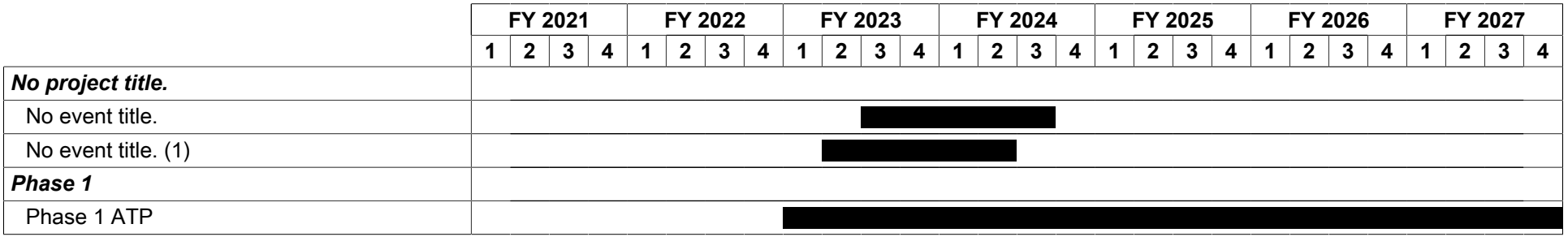

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 1206442F / *Next Generation OPIR*	**Project (Number/Name)** 657121 / *Next-Gen OPIR Space, Block 0 Polar*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
No project title.				
No event title.	3	2023	3	2024
No event title. (1)	2	2023	2	2024
Phase 1				
Phase 1 ATP	1	2023	4	2027

Note

Next-Gen OPIR Polar efforts continue past 2020