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**Department of Defense
Fiscal Year (FY) 2026 Budget Estimates**

June 2025



Air Force

Justification Book Volume 1 of 4

Research, Development, Test & Evaluation, Air Force

Vol 1

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Air Force • Budget Estimates FY 2026 • RDT&E Program

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Fiscal Year (FY) 2026 President's Budget RDT&E Descriptive Summaries Budget Activities June 2025

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 FY26 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 2026 RDT&E program with the exception of classified program elements. The format and contents of this document are in accordance to the guidelines and requirements of the Congressional committees in so far as possible.
 - The "Other Program Funding Summary" portion of the R-2 includes, in addition to RDT&E funds, Procurement funds and quantities, Military Construction appropriation funds on specific development programs, Operations and Maintenance appropriation funds where they are essential to the development effort described, and where appropriate, Department of Energy (DOE) costs.

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

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Department of Defense
FY 2026 President's Budget
Exhibit R-1 FY 2026 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Jun 2025

<u>Appropriation</u>	FY 2024	FY 2025	FY 2025	FY 2025	FY 2026	FY 2026	FY 2026
	Actuals	Enacted	Supplemental	Total	Disc Request	Reconciliation Request	Total
Research, Development, Test and Evaluation, Air Force	47,693,850	46,811,425	69,278	46,880,703	52,017,288	10,226,620	62,243,908
Total Research, Development, Test, & Evaluation	47,693,850	46,811,425	69,278	46,880,703	52,017,288	10,226,620	62,243,908

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

Jun 2025

Appropriation: 3600F Research, Development, Test and Evaluation, Air Force

Line No	Program Element Number	Item	Act	Sec	FY 2024 Actuals	FY 2025 Enacted	FY 2025 Supplemental	FY 2025 Total	FY 2026 Disc Request	FY 2026 Reconciliation Request	FY 2026 Total
1	0601102F	Defense Research Sciences	01	U	347,393	361,930		361,930	302,716		302,716
2	0601103F	University Research Initiatives	01	U	172,154	146,372		146,372	94,121		94,121
	Basic Research				519,547	508,302		508,302	396,837		396,837
3	0602020F	Future AF Capabilities Applied Research	02	U	77,903	70,277		70,277	78,214		78,214
4	0602022F	University Affiliated Research Center (UARC) - Tactical Autonomy	02	U	6,180	8,225		8,225	6,294		6,294
5	0602102F	Materials	02	U	274,790	185,336		185,336	147,422		147,422
6	0602201F	Aerospace Vehicle Technologies	02	U	188,530	15,235		15,235			
7	0602202F	Human Effectiveness Applied Research	02	U	138,098	137,425		137,425	133,928		133,928
8	0602203F	Aerospace Systems Technologies	02	U	233,413	333,320		333,320	321,059		321,059
9	0602204F	Aerospace Sensors	02	U	236,340	193,029		193,029	199,120		199,120
10	0602212F	Defense Laboratories R&D Projects (10 U.S.C, Sec 2358)	02	U	111,692						
11	0602298F	Science and Technology Management - Major Headquarters Activities	02	U	10,303	9,662		9,662	10,813		10,813
12	0602336F	Nuclear Delivery Systems Tech Exploration	02	U					4,969		4,969
13	0602602F	Conventional Munitions	02	U	149,962	142,497		142,497	125,102		125,102
14	0602605F	Directed Energy Technology	02	U	111,169	98,012		98,012	92,331		92,331
15	0602788F	Dominant Information Sciences and Methods	02	U	337,052	207,333		207,333	187,036		187,036
	Applied Research				1,875,432	1,400,351		1,400,351	1,306,288		1,306,288
16	0603032F	Future AF Integrated Technology Demos	03	U	154,013	161,336		161,336	268,754		268,754

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17	0603112F	Advanced Materials for Weapon Systems	03	U	55,005	32,161		32,161	31,021		31,021
18	0603199F	Sustainment Science and Technology (S&T)	03	U	9,710	5,668		5,668	12,915		12,915
19	0603203F	Advanced Aerospace Sensors	03	U	51,051	37,935		37,935	69,652		69,652
20	0603211F	Aerospace Technology Dev/Demo	03	U	131,596	91,719		91,719	102,125		102,125
21	0603216F	Aerospace Propulsion and Power Technology	03	U	92,129						
22	0603270F	Electronic Combat Technology	03	U	30,543	36,445		36,445			
23	0603273F	Science & Technology for Nuclear Re-entry Systems	03	U	65,088	91,885		91,885	128,407		128,407
24	0603444F	Maui Space Surveillance System (MSSS)	03	U	2						
25	0603456F	Human Effectiveness Advanced Technology Development	03	U	39,929	14,608		14,608	19,790		19,790
26	0603601F	Conventional Weapons Technology	03	U	122,854	125,460		125,460	99,263		99,263
27	0603605F	Advanced Weapons Technology	03	U	96,178	25,050		25,050	4,434		4,434
28	0603680F	Manufacturing Technology Program	03	U	165,721	116,130		116,130	38,891		38,891
29	0603788F	Battlespace Knowledge Development and Demonstration	03	U	59,611	53,672		53,672	30,812		30,812
30	0604776F	Deployment & Distribution Enterprise R&D	03	U		19,441		19,441	28,316		28,316
31	0207412F	Control and Reporting Center (CRC)	03	U		2,012		2,012			
Advanced Technology Development					1,073,430	813,522		813,522	834,380		834,380
32	0603260F	Intelligence Advanced Development	04	U	6,977	3,820		3,820	3,901		3,901
33	0603742F	Combat Identification Technology	04	U	15,922	16,790		16,790	25,172		25,172

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34	0603790F	NATO Research and Development	04	U	2,208	2,298		2,298	4,595		4,595
35	0603851F	Intercontinental Ballistic Missile - Dem/Val	04	U	51,948	125,561		125,561	90,096		90,096
36	0604001F	NC3 Advanced Concepts	04	U	5,274	5,448		5,448	15,910		15,910
37	0604003F	Advanced Battle Management System (ABMS)	04	U	455,382	611,943		611,943	1,040,475		1,040,475
38	0604004F	Advanced Engine Development	04	U	269,971	100,000		100,000			
39	0604005F	NC3 Commercial Development & Prototyping	04	U	66,406	52,524		52,524	67,081		67,081
40	0604007F	E-7	04	U	849,565	607,413		607,413	199,676		199,676
41	0604009F	AFWERX	04	U	97,250	62,580		62,580	18,499		18,499
42	0604010F	Next Generation Adaptive Propulsion	04	U	573,832	507,337		507,337	330,270		330,270
43	0604015F	Long Range Strike - Bomber	04	U	2,877,844	2,654,073		2,654,073	2,347,225	2,391,920	4,739,145
44	0604025F	Rapid Defense Experimentation Reserve (RDER)	04	U	62,595	75,051		75,051			
45	0604032F	Directed Energy Prototyping	04	U	1,246	1,312		1,312			
46	0604033F	Hypersonics Prototyping	04	U	27,903						
47	0604183F	Hypersonics Prototyping - Hypersonic Attack Cruise Missile (HACM)	04	U	333,328	466,729		466,729	802,810		802,810
48	0604201F	PNT Resiliency, Mods, and Improvements	04	U	17,206						
49	0604257F	Advanced Technology and Sensors	04	U	22,616	15,865		15,865	40,779		40,779
50	0604283F	Battle Mgmt Com & Ctrl Sensor Development	04	U						150,000	150,000

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51	0604288F	Survivable Airborne Operations Center (SAOC)	04	U	717,641	1,617,187		1,617,187			
52	0604317F	Technology Transfer	04	U	35,952	10,485		10,485	3,558		3,558
53	0604327F	Hard and Deeply Buried Target Defeat System (HDBTDS) Program	04	U	14,866	139,408		139,408	144,143		144,143
54	0604336F	Nuclear Delivery Systems Prototyping	04	U		39,079		39,079	56,926		56,926
55	0604414F	Cyber Resiliency of Weapon Systems-ACS	04	U	35,712	45,555		45,555	46,148		46,148
56	0604609F	Requirements Analysis & Concept Maturation	04	U		12,622		12,622	22,754		22,754
57	0604668F	Joint Transportation Management System (JTMS)	04	U	26,036	74,103		74,103	129,626		129,626
58	0604776F	Deployment & Distribution Enterprise R&D	04	U	23,733	4,840		4,840	4,996		4,996
59	0604858F	Tech Transition Program	04	U	232,375	239,342		239,342	134,833	164,000	298,833
60	0604860F	Operational Energy and Installation Resilience	04	U	23,270	25,395		25,395	49,460		49,460
61	0605057F	Next Generation Air-refueling System	04	U	9,325	7,014		7,014	12,960		12,960
62	0605164F	Air Refueling Capability Modernization	04	U	15,201	13,661		13,661			
63	0606004F	Nuclear Enterprise Research & Development	04	U					1,097		1,097
64	0606005F	Digital Transformation Office	04	U	57,511	9,800		9,800	15,997		15,997
65	0207110F	F-47	04	U	2,346,905	2,424,208		2,424,208			
66	0207147F	Collaborative Combat Aircraft	04	U		711,747		711,747	111,365	678,000	789,365

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67	0207179F	Autonomous Collaborative Platforms	04	U	110,945	50,666		50,666	62,019		62,019
68	0207420F	Combat Identification	04	U	1,902	1,914		1,914	1,713		1,713
69	0207423F	Advanced Communications Systems	04	U						5,500	5,500
70	0207448F	C2ISR Tactical Data Link	04	U		3,500		3,500			
71	0207455F	Three Dimensional Long-Range Radar (3DELRR)	04	U	13,875	8,100		8,100	17,344		17,344
72	0207522F	Airbase Air Defense Systems (ABADS)	04	U	67,182	17,273		17,273	15,785	15,000	30,785
73	0207606F	Joint Simulation Environment (JSE)	04	U		149,502		149,502	260,667		260,667
74	0208030F	War Reserve Materiel - Ammunition	04	U	7,897	5,226		5,226	9,865		9,865
75	0303010F	AF ISR Digital Infrastructure	04	U		18,733		18,733	24,817	2,200	27,017
76	0305236F	Common Data Link Executive Agent (CDL EA)	04	U	25,157	33,349		33,349	32,511		32,511
77	0305601F	Mission Partner Environments	04	U	17,078	18,438		18,438	14,956		14,956
78	0701200F	Enterprise Select Class II	04	U					1,000		1,000
79	0708051F	Rapid Sustainment Modernization (RSM)	04	U	78,431	50,044		50,044	32,666		32,666
80	0808736F	Special Victim Accountability and Investigation	04	U		3,006		3,006	1,997		1,997
81	0808737F	Integrated Primary Prevention	04	U	9,021	5,364		5,364	5,167		5,167
82	0901410F	Contracting Information Technology System	04	U	22,964	28,995		28,995	29,277		29,277
83	1206415F	U.S. Space Command Research and Development Support	04	U	8,782	24,446		24,446	36,913		36,913
Advanced Component Development & Prototypes					9,639,234	11,101,746		11,101,746	6,267,049	3,406,620	9,673,669

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84	0604200F	Future Advanced Weapon Analysis & Programs	05	U	9,589	7,205		7,205	36,125		36,125
85	0604201F	PNT Resiliency, Mods, and Improvements	05	U	171,555	214,900		214,900	125,663		125,663
86	0604222F	Nuclear Weapons Support	05	U	44,219	70,823		70,823	79,312		79,312
87	0604270F	Electronic Warfare Development	05	U	23,673	13,754		13,754	17,013		17,013
88	0604281F	Tactical Data Networks Enterprise	05	U	82,369	78,480		78,480	77,170		77,170
89	0604287F	Physical Security Equipment	05	U	9,836	10,569		10,569	10,589		10,589
90	0604288F	Survivable Airborne Operations Center (SAOC)	05	U					1,826,328	6,800	1,833,128
91	0604602F	Armament/Ordnance Development	05	U	5,036	5,417		5,417	7,253		7,253
92	0604604F	Submunitions	05	U	3,345	3,427		3,427	3,502		3,502
93	0604617F	Agile Combat Support	05	U	50,747	23,635		23,635	23,474		23,474
94	0604706F	Life Support Systems	05	U	37,578	24,502		24,502	20,542		20,542
95	0604735F	Combat Training Ranges	05	U	56,609	160,783		160,783	139,499		139,499
96	0604932F	Long Range Standoff Weapon	05	U	856,942	593,926		593,926	606,955		606,955
97	0604933F	ICBM Fuze Modernization	05	U	40,447				3,252		3,252
98	0605030F	Joint Tactical Network Center (JTNC)	05	U	2,256						
99	0605031F	Joint Tactical Network (JTN)	05	U	452						
100	0605056F	Open Architecture Management	05	U	34,239	41,223		41,223	44,150		44,150
101	0605223F	Advanced Pilot Training	05	U	58,803	248,589		248,589	172,378		172,378
102	0605229F	HH-60W	05	U	39,815						

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103	0605238F	Ground Based Strategic Deterrent EMD	05	U	4,327,250	2,011,024		2,011,024	2,647,563	1,500,000	4,147,563
104	0605296F	Microelectronics Secure Enclave	05	U					104,990		104,990
105	0102417F	Over-the-Horizon Backscatter Radar	05	U	471,042	377,394		377,394			
106	0207039F	Cognitive Electromagnetic Warfare	05	U					44,267		44,267
107	0207110F	F-47	05	U					2,579,362	900,000	3,479,362
108	0207171F	F-15 EPAWSS	05	U	12,975						
109	0207279F	Isolated Personnel Survivability and Recovery	05	U	54,271	10,020		10,020	99,248		99,248
110	0207328F	Stand In Attack Weapon	05	U	220,978	346,341		346,341	255,336		255,336
111	0207407F	Electromagnetic Battle Management (EMBM)	05	U					20,439		20,439
112	0207701F	Full Combat Mission Training	05	U	7,597	7,754		7,754	12,898		12,898
113	0208036F	Medical C-CBRNE Programs	05	U	2,006						
114	0303008F	SATURN	05	U					4,985		4,985
115	0303267F	Auctioned Spectrum Relocation Fund	05	U	21,667						
116	0303867F	AMBIT - Post-Auctioned SRF	05	U	19,057						
117	0305155F	Theater Nuclear Weapon Storage & Security System	05	U		2,000		2,000	19,875		19,875
118	0305205F	Endurance Unmanned Aerial Vehicles	05	U	30,000						
119	0305282F	Joint Fires Network (JFN)	05	U						132,420	132,420
120	0401221F	KC-46A Tanker Squadrons	05	U	78,704	77,804		77,804	145,434		145,434
121	0401319F	VC-25B	05	U	94,750	433,943		433,943	602,318		602,318
122	0701212F	Automated Test Systems	05	U	10,007	21,634		21,634	30,341		30,341

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123	0804772F	Training Developments	05	U	1,248	4,960		4,960	5,067		5,067
124	1203176F	Combat Survivor Evader Locator	05	U		1,135		1,135			
		System Development & Demonstration			6,879,062	4,791,242		4,791,242	9,765,328	2,539,220	12,304,548
125	0604256F	Threat Simulator Development	06	U	16,418	17,291		17,291	41,125		41,125
126	0604759F	Major T&E Investment	06	U	30,758	74,228		74,228	156,915		156,915
127	0605101F	RAND Project Air Force	06	U	30,998	39,720		39,720	32,405		32,405
128	0605502F	Small Business Innovation Research	06	U	947,652						
129	0605712F	Initial Operational Test & Evaluation	06	U	13,720	14,247		14,247	13,872		13,872
130	0605807F	Test and Evaluation Support	06	U	960,429	936,913		936,913	1,098,871		1,098,871
131	0605827F	Acq Workforce- Global Vig & Combat Sys	06	U	317,901	327,724		327,724			
132	0605828F	Acq Workforce- Global Reach	06	U	486,427	503,040		503,040			
133	0605829F	Acq Workforce- Cyber, Network, & Bus Sys	06	U	502,787	466,068		466,068	435,918		435,918
134	0605831F	Acq Workforce- Capability Integration	06	U	273,530	291,444		291,444	1,153,165		1,153,165
135	0605832F	Acq Workforce- Advanced Prgm Technology	06	U	72,767	68,182		68,182			
136	0605833F	Acq Workforce- Nuclear Systems	06	U	305,322	343,180		343,180	368,881		368,881
137	0605898F	Management HQ - R&D	06	U	6,705	6,291		6,291	5,960		5,960
138	0605976F	Facilities Restoration and Modernization - Test and Evaluation Support	06	U	116,389	94,828		94,828	217,761		217,761

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139	0605978F	Facilities Sustainment - Test and Evaluation Support	06	U	56,218	63,579		63,579	91,969		91,969
140	0606017F	Requirements Analysis and Maturation	06	U	114,631	31,450		31,450	28,157		28,157
141	0606398F	Management HQ - T&E	06	U	7,748	7,647		7,647	7,417		7,417
142	0208201F	Offensive small Unmanned Aircraft Systems (sUAS)	06	U					4,985		4,985
143	0303255F	Command, Control, Communication, and Computers (C4) - STRATCOM	06	U	45,725	39,607		39,607	15,662		15,662
144	0308602F	ENTEPRISE INFORMATION SERVICES (EIS)	06	U	96,912	104,133		104,133	101,779		101,779
145	0702806F	Acquisition and Management Support	06	U	24,436	25,216		25,216	22,670		22,670
146	0804776F	Advanced Distributed Learning	06	U		828		828	1,698		1,698
147	0909999F	Financing for Cancelled Account Adjustments	06	U	2,696						
148	1001004F	International Activities	06	U	3,917	4,254		4,254	4,430		4,430
	Management Support				4,434,086	3,459,870		3,459,870	3,803,640		3,803,640
149	0604233F	Specialized Undergraduate Flight Training	07	U	26,265	30,043		30,043	66,200		66,200
150	0604283F	Battle Mgmt Com & Ctrl Sensor Development	07	U	27,388	69,040		69,040	17,353		17,353
151	0604445F	Wide Area Surveillance	07	U	9,269	21,443		21,443			
152	0604617F	Agile Combat Support	07	U	5,446						
153	0604840F	F-35 C2D2	07	U	1,236,710	1,134,207		1,134,207	1,182,094		1,182,094
154	0605018F	AF Integrated Personnel and Pay System (AF-IPPS)	07	U	63,451	49,739		49,739	64,050		64,050

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Line No	Program Element Number	Item	Act	Sec	FY 2024 Actuals	FY 2025 Enacted	FY 2025 Supplemental	FY 2025 Total	FY 2026 Disc Request	FY 2026 Reconciliation Request	FY 2026 Total
155	0605024F	Anti-Tamper Technology Executive Agency	07	U	49,311	65,792		65,792	62,965		62,965
156	0605117F	Foreign Materiel Acquisition and Exploitation	07	U	166,851	94,188		94,188			
157	0605229F	HH-60W	07	U		39,629		39,629	43,579	15,129	58,708
158	0605278F	HC/MC-130 Recap RDT&E	07	U	13,195	16,085		16,085	50,845		50,845
159	0606018F	NC3 Integration	07	U	22,222	21,864		21,864	40,066		40,066
160	0101113F	B-52 Squadrons	07	U	880,341	1,051,116		1,051,116	931,164		931,164
161	0101122F	Air-Launched Cruise Missile (ALCM)	07	U	279	542		542	555		555
162	0101126F	B-1B Squadrons	07	U	12,291	17,939		17,939	116,589		116,589
163	0101127F	B-2 Squadrons	07	U	83,010	37,862		37,862	12,519		12,519
164	0101213F	Minuteman Squadrons	07	U	41,732	59,320		59,320	106,032		106,032
165	0101316F	Worldwide Joint Strategic Communications	07	U	23,522	13,690		13,690	24,081		24,081
166	0101318F	Service Support to STRATCOM - Global Strike	07	U	7,562	7,330		7,330	6,928		6,928
167	0101328F	ICBM Reentry Vehicles	07	U	452,306	392,423		392,423	259,605	100,000	359,605
169	0102110F	MH-139A	07	U	25,464	15,000		15,000	5,982		5,982
170	0102326F	Region/Sector Operation Control Center Modernization Program	07	U	831	852		852	726		726
171	0102417F	Over-the-Horizon Backscatter Radar	07	U					132,097	70,600	202,697
172	0202834F	Vehicles and Support Equipment - General	07	U	9,474	6,097		6,097	744		744
173	0205219F	MQ-9 UAV	07	U	82,393	7,074		7,074	26,689		26,689

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174	0205671F	Joint Counter RCIED Electronic Warfare	07	U	2,303	3,372		3,372	3,424		3,424
175	0207040F	Multi-Platform Electronic Warfare Equipment	07	U	14,312						
176	0207133F	F-16 Squadrons	07	U	119,589	104,252		104,252	216,638		216,638
177	0207134F	F-15E Squadrons	07	U	40,348	158,603		158,603	233,018		233,018
178	0207136F	Manned Destructive Suppression	07	U	12,871	13,855		13,855	17,680		17,680
179	0207138F	F-22A Squadrons	07	U	640,109	758,754		758,754	852,332		852,332
180	0207142F	F-35 Squadrons	07	U	88,991	47,132		47,132	48,446		48,446
181	0207146F	F-15EX	07	U	101,996	56,228		56,228	78,345	2,100	80,445
182	0207161F	Tactical AIM Missiles	07	U	40,473	34,932		34,932	86,549		86,549
183	0207163F	Advanced Medium Range Air-to-Air Missile (AMRAAM)	07	U	51,976	53,593		53,593	51,242		51,242
184	0207172F	Joint Advanced Tactical Missile (JATM)	07	U					425,029		425,029
185	0207227F	Combat Rescue - Pararescue	07	U	659	743		743			
186	0207238F	E-11A	07	U	23,044	30,967		30,967	15,244		15,244
187	0207242F	Special Program Applications	07	U						35,000	35,000
188	0207247F	AF TENCAP	07	U	30,649	50,263		50,263	52,492		52,492
189	0207249F	Precision Attack Systems Procurement	07	U	11,459	9,423		9,423	13,613		13,613
190	0207253F	Compass Call	07	U	62,555	132,475		132,475		63,137	63,137
191	0207268F	Aircraft Engine Component Improvement Program	07	U	58,262	60,498		60,498	52,734		52,734

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192	0207325F	Joint Air-to-Surface Standoff Missile (JASSM)	07	U	129,314	181,692		181,692	232,252		232,252
193	0207327F	Small Diameter Bomb (SDB)	07	U	42,860	29,910		29,910	24,810		24,810
194	0207410F	Air & Space Operations Center (AOC)	07	U	69,798	65,102		65,102	113,086		113,086
195	0207412F	Control and Reporting Center (CRC)	07	U	17,074	16,856		16,856	17,569		17,569
196	0207418F	AFSPECCWAR - TACP	07	U	1,622	1,433		1,433			
198	0207431F	Combat Air Intelligence System Activities	07	U	75,883	25,049		25,049	33,601		33,601
199	0207438F	Theater Battle Management (TBM) C4I	07	U	6,231	4,401		4,401	6,787		6,787
200	0207439F	Electromagnetic Warfare Int Reprog (EWIR)	07	U	10,007	13,577		13,577	60,072		60,072
201	0207444F	Tactical Air Control Party-Mod	07	U	24,093	12,171		12,171			
202	0207452F	DCAPES	07	U	6,686	8,431		8,431	8,507		8,507
203	0207457F	Air Force Special Warfare (SPECWAR)	07	U					27,526		27,526
204	0207521F	Air Force Calibration Programs	07	U	2,172	2,223		2,223	2,273		2,273
205	0207573F	National Technical Nuclear Forensics	07	U	1,974	2,060		2,060			
206	0207590F	Seek Eagle	07	U	33,417	34,985		34,985	33,707		33,707
207	0207605F	Wargaming and Simulation Centers	07	U	11,894						
208	0207611F	Readiness Decision Support Enterprise	07	U					8,880		8,880
209	0207697F	Distributed Training and Exercises	07	U	3,678	3,964		3,964	4,399		4,399
210	0207701F	Full Combat Mission Training	07	U		3,948		3,948	8,096		8,096

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211	0208006F	Mission Planning Systems	07	U	83,500	80,709		80,709	138,745		138,745
212	0208007F	Tactical Deception	07	U	35,250	539		539	13,711		13,711
213	0208087F	Distributed Cyber Warfare Operations	07	U	40,457	29,996		29,996	31,197		31,197
214	0208088F	AF Defensive Cyberspace Operations	07	U	62,058	89,618		89,618	95,034		95,034
218	0208288F	Intel Data Applications	07	U	5,217	988		988	1,012	6,700	7,712
219	0301025F	GeoBase	07	U	1,458				999		999
220	0301113F	Cyber Security Intelligence Support	07	U	8,476	18,141		18,141	14,749		14,749
226	0301377F	Countering Advanced Conventional Weapons (CACW)	07	U		834		834	1,117		1,117
228	0301401F	AF Multi-Domain Non-Traditional ISR Battlespace Awareness	07	U	2,890	3,006		3,006	2,987		2,987
229	0302015F	E-4B National Airborne Operations Center (NAOC)	07	U	42,074	57,441		57,441	54,457		54,457
230	0302315F	Non-Kinetic Countermeasure Support	07	U		7,590		7,590	7,006		7,006
231	0303004F	EIT CONNECT	07	U	7,923	16,120		16,120			
232	0303089F	Cyberspace and DoDIN Operations	07	U	4,738	9,776		9,776	10,080		10,080
233	0303131F	Minimum Essential Emergency Communications Network (MEECN)	07	U	31,099	25,500		25,500	99,599		99,599
234	0303133F	High Frequency Radio Systems	07	U	26,370	8,667		8,667	19,955		19,955
235	0303140F	Information Systems Security Program	07	U	89,233	94,424		94,424	98,414		98,414
236	0303248F	All Domain Common Platform	07	U	69,565	82,927		82,927	76,642		76,642
237	0303260F	Joint Military Deception Initiative	07	U	4,510	7,324		7,324	356		356

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238	0304100F	Strategic Mission Planning & Execution System (SMPES)	07	U	62,807	69,441		69,441	75,164		75,164
239	0304109F	THRESHER	07	U					105		105
242	0304260F	Airborne SIGINT Enterprise	07	U	113,429	85,284		85,284	90,650		90,650
243	0304310F	Commercial Economic Analysis	07	U	4,245	4,719		4,719	4,127		4,127
246	0305015F	C2 Air Operations Suite - C2 Info Services	07	U	13,273	13,524		13,524			
247	0305020F	CCMD Intelligence Information Technology	07	U	1,660	1,836		1,836	1,547		1,547
248	0305022F	ISR Modernization & Automation Dvmt (IMAD)	07	U	15,180	19,409		19,409	22,237		22,237
249	0305099F	Global Air Traffic Management (GATM)	07	U	4,928	5,151		5,151	4,257		4,257
250	0305103F	Cyber Security Initiative	07	U		304		304	310		310
251	0305111F	Weather Service	07	U	52,701	40,782		40,782	30,509		30,509
252	0305114F	Air Traffic Control, Approach, and Landing System (ATCALs)	07	U	25,910	15,143		15,143	17,259		17,259
253	0305116F	Aerial Targets	07	U	6,671	6,085		6,085	5,081		5,081
256	0305128F	Security and Investigative Activities	07	U	339	481		481	8,964		8,964
257	0305146F	Defense Joint Counterintelligence Activities	07	U	6,930	6,387		6,387	6,524		6,524
258	0305158F	Tactical Terminal	07	U		501		501	1,099		1,099
259	0305179F	Integrated Broadcast Service (IBS)	07	U	18,540	16,006		16,006	19,085		19,085
260	0305202F	Dragon U-2	07	U	16,842						
261	0305206F	Airborne Reconnaissance Systems	07	U	56,158	84,363		84,363	25,432		25,432

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262	0305207F	Manned Reconnaissance Systems	07	U	14,330	16,323		16,323	16,643		16,643
263	0305208F	Distributed Common Ground/Surface Systems	07	U	92,354	86,476		86,476	79,033		79,033
264	0305220F	RQ-4 UAV	07	U	1,242	6,171		6,171			
265	0305221F	Network-Centric Collaborative Targeting	07	U	20,696	8,952		8,952	12,019		12,019
266	0305238F	NATO AGS	07	U	2	865		865	816		816
267	0305240F	ISR Transport and Processing	07	U	33,589	30,932		30,932	32,578		32,578
268	0305249F	AF JWICS Enterprise	07	U		9,445		9,445	21,097		21,097
269	0305600F	International Intelligence Technology and Architectures	07	U	15,322	17,784		17,784	18,946		18,946
270	0305836F	C2IMERA	07	U					13,867		13,867
271	0305881F	Rapid Cyber Acquisition	07	U	8,482						
272	0305903F	COCOM Mobile Command and Control Centers (MCCCs)	07	U					3,988		3,988
273	0305984F	Personnel Recovery Command & Ctrl (PRC2)	07	U	3,162	2,831		2,831	2,891		2,891
274	0307577F	Intelligence Mission Data (IMD)	07	U	7,090	3,658		3,658	3,000		3,000
275	0401115F	C-130 Airlift Squadron	07	U	21,959						
276	0401119F	C-5 Airlift Squadrons (IF)	07	U	25,938	32,903		32,903	33,713		33,713
277	0401130F	C-17 Aircraft (IF)	07	U	2,702	11,986		11,986	76,514	4,410	80,924
278	0401132F	C-130J Program	07	U	21,469	63,533		63,533	31,354		31,354
279	0401134F	Large Aircraft IR Countermeasures (LAIRCM)	07	U	3,909	7,768		7,768	52,928		52,928
280	0401218F	KC-135s	07	U	71,854	9,899		9,899		43,000	43,000

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281	0401318F	CV-22	07	U	16,581	26,249		26,249	653	30,857	31,510
282	0408011F	Special Tactics / Combat Control	07	U	7,711	9,421		9,421			
283	0708610F	Logistics Information Technology (LOGIT)	07	U	20,682	11,895		11,895	18,581		18,581
284	0801380F	AF LVC Operational Training (LVC-OT)	07	U	21,423	27,535		27,535	33,898		33,898
285	0804743F	Other Flight Training	07	U	2,182	1,159		1,159	2,371		2,371
286	0901202F	Joint Personnel Recovery Agency	07	U	2,158	2,320		2,320	2,080		2,080
287	0901218F	Civilian Compensation Program	07	U	3,703	4,267		4,267	4,355		4,355
288	0901220F	Personnel Administration	07	U	3,559	3,163		3,163	2,766		2,766
289	0901226F	Air Force Studies and Analysis Agency	07	U	875	9,941		9,941	14,761		14,761
290	0901538F	Financial Management Information Systems Development	07	U	4,093	5,634		5,634	3,982		3,982
291	0901554F	Defense Enterprise Acntng and Mgt Sys (DEAMS)	07	U	48,412	57,689		57,689	38,942		38,942
292	1201921F	Service Support to STRATCOM - Space Activities	07	U					335		335
293	1202140F	Service Support to SPACECOM Activities	07	U	9,752						
999	999999999	Classified Programs	07	U	16,897,785	18,292,410	69,278	18,361,688	22,264,031	3,909,847	26,173,878
		Operational Systems Development			23,273,059	24,736,392	69,278	24,805,670	29,643,766	4,280,780	33,924,546
Total Research, Development, Test and Evaluation, Air Force					47,693,850	46,811,425	69,278	46,880,703	52,017,288	10,226,620	62,243,908

1. FY 2024 includes \$6,958K in OOC Actuals. FY 2025 includes \$2,819K in OOC Enactment. FY 2026 includes \$2,012K for the OOC Budget Estimate.

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Information Systems Security Program	0303140F	235	07.....	Volume 4 - 359
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Tactical Data Networks Enterprise	0604281F	88	05.....	Volume 2 - 645
Tactical Deception	0208007F	212	07.....	Volume 4 - 205
Tactical Terminal	0305158F	258	07.....	Volume 4 - 539
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Technology Transfer	0604317F	52	04.....	Volume 2 - 231
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Department of Defense
FY 2026 President's Budget
Exhibit R-1 FY 2026 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Jun 2025

	FY 2024 Actuals	FY 2025 Enacted	FY 2025 Supplemental	FY 2025 Total	FY 2026 Disc Request ¹	FY 2026 Reconciliation Request	FY 2026 Total
<u>Summary Recap of Budget Activities</u>							
Basic Research	519,547	508,302		508,302	396,837		396,837
Applied Research	1,875,432	1,400,351		1,400,351	1,306,288		1,306,288
Advanced Technology Development	1,073,430	813,522		813,522	834,380		834,380
Advanced Component Development & Prototypes	9,639,234	11,101,746		11,101,746	6,267,049	3,406,620	9,673,669
System Development & Demonstration	6,879,062	4,791,242		4,791,242	9,765,328	2,539,220	12,304,548
Management Support	4,434,086	3,459,870		3,459,870	3,803,640		3,803,640
Operational Systems Development	23,273,059	24,736,392	69,278	24,805,670	29,643,766	4,280,780	33,924,546
Total Research, Development, Test, & Evaluation	47,693,850	46,811,425	69,278	46,880,703	52,017,288	10,226,620	62,243,908
<u>Summary Recap of FYDP Programs</u>							
Strategic Forces	1,998,380	1,973,468		1,973,468	1,596,278	170,600	1,766,878
General Purpose Forces	4,901,181	5,874,176		5,874,176	6,530,776	1,705,437	8,236,213
Intelligence and Communications	1,139,814	1,100,863		1,100,863	1,118,174	134,620	1,252,794
Mobility Forces	345,577	673,506		673,506	942,914	78,267	1,021,181
Research and Development	22,132,772	18,603,517		18,603,517	19,271,818	4,227,849	23,499,667
Central Supply and Maintenance	133,556	108,789		108,789	105,258		105,258
Training Medical and Other	33,874	42,852		42,852	50,198		50,198
Administration and Associated Activities	88,460	112,009		112,009	96,163		96,163
Support of Other Nations	3,917	4,254		4,254	4,430		4,430
Space	18,534	25,581		25,581	37,248		37,248
Classified Programs	16,897,785	18,292,410	69,278	18,361,688	22,264,031	3,909,847	26,173,878
Total Research, Development, Test, & Evaluation	47,693,850	46,811,425	69,278	46,880,703	52,017,288	10,226,620	62,243,908

1. FY 2024 includes \$6,958K in OOC Actuals. FY 2025 includes \$2,819K in OOC Enactment. FY 2026 includes \$2,012K for the OOC Budget Estimate.

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Department of the Air Force
TOTAL CIVILIAN PERSONNEL COSTS
OP-8B: OP-8 (PB)
FY 2026 President's Budget Submission
(FY 2024)

	(\$ in Thousands)											Rates				
	a Begin Strength	b End Strength	c FTEs	d Basic Comp	e Overtime Pay	f Holiday Pay	g Other O.C.11	e + f + g h Total Variables	d + h i Comp O.C.11	j Benefits O.C.12/13	i + j k Comp & Benefits	d/c l Basic Comp	i/c m Total Comp	k/c n Comp & Benefits	h/d o % BC Variables	j/d p % BC Benefits
Direct Funded Personnel (includes OC 13)	20,333	19,927	19,969	2,489,673	0	0	0	0	2,489,673	1,100,619	3,590,292	\$124,677	\$124,677	\$179,793	0.0%	44.2%
D1. US Direct Hire (USDH)	20,329	19,925	19,967	2,489,341	-	-	-	-	2,489,341	1,100,619	3,589,960	\$124,673	\$124,673	\$179,795	0.0%	44.2%
D1a. Senior Executive Schedule	23	75	75	11,567	-	-	-	-	11,567	4,164	15,731	\$154,227	\$154,227	\$209,747	0.0%	36.0%
D1b. General Schedule	19,425	16,594	16,636	2,251,683	-	-	-	-	2,251,683	1,015,062	3,266,745	\$135,350	\$135,350	\$196,366	0.0%	45.1%
D1c. Special Schedule	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D1d. Wage System	881	3,256	3,256	226,091	-	-	-	-	226,091	81,393	307,484	\$69,438	\$69,438	\$94,436	0.0%	36.0%
D1e. Highly Qualified Experts	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D1f. Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D2. Direct Hire Program Foreign Nationals (DHFN)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D3. Total Direct Hire	20,329	19,925	19,967	2,489,341	-	-	-	-	2,489,341	1,100,619	3,589,960	\$124,673	\$124,673	\$179,795	0.0%	44.2%
D4. Indirect Hire Foreign Nationals (IHFN)	4	2	2	332	-	-	-	-	332	332	332	\$166,000	\$166,000	\$166,000	0.0%	0.0%
Subtotal - Direct Funded (excludes OC 13)	20,333	19,927	19,969	2,489,673	-	-	-	-	2,489,673	1,100,619	3,590,292	\$124,677	\$124,677	\$179,793	0.0%	44.2%
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)	2,788	4,007	4,007	544,987	0	0	0	0	544,987	0	544,987	\$136,009	\$136,009	\$136,009	0.0%	0.0%
R1. US Direct Hire (USDH)	2,788	4,007	4,007	544,987	-	-	-	-	544,987	-	544,987	\$136,009	\$136,009	\$136,009	0.0%	0.0%
R1a. Senior Executive Schedule	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R1b. General Schedule	2,788	4,007	4,007	544,987	-	-	-	-	544,987	-	544,987	\$136,009	\$136,009	\$136,009	0.0%	0.0%
R1c. Special Schedule	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R1d. Wage System	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R1e. Highly Qualified Experts	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R1f. Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R2. Direct Hire Program Foreign Nationals (DHFN)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R3. Total Direct Hire	2,788	4,007	4,007	544,987	-	-	-	-	544,987	-	544,987	\$136,009	\$136,009	\$136,009	0.0%	0.0%
R4. Indirect Hire Foreign Nationals (IHFN)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal - Reimbursable Funded (excludes OC 13)	2,788	4,007	4,007	544,987	-	-	-	-	544,987	-	544,987	\$136,009	\$136,009	\$136,009	0.0%	0.0%
R5. Other Object Class 13 Benefits	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R5a. USDH - Benefits for Former Employees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R5b. DHFN - Benefits for Former Employees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R5c. Voluntary Separation Incentive Pay (VSIP)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R5d. Foreign National Separation Liability Accrual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Personnel (includes OC 13)	23,121	23,934	23,976	3,034,660	0	0	0	0	3,034,660	1,100,619	4,135,279	\$126,571	\$126,571	\$172,476	0.0%	36.3%
T1. US Direct Hire (USDH)	23,117	23,932	23,974	3,034,328	-	-	-	-	3,034,328	1,100,619	4,134,947	\$126,567	\$126,567	\$172,476	0.0%	36.3%
T1a. Senior Executive Schedule	23	75	75	11,567	0	0	0	0	11,567	4,164	15,731	\$154,227	\$154,227	\$209,747	0.0%	36.0%
T1b. General Schedule	22,213	20,601	20,643	2,796,670	0	0	0	0	2,796,670	1,015,062	3,811,732	\$135,478	\$135,478	\$184,650	0.0%	36.3%
T1c. Special Schedule	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-
T1d. Wage System	881	3,256	3,256	226,091	0	0	0	0	226,091	81,393	307,484	\$69,438	\$69,438	\$94,436	0.0%	36.0%
T1e. Highly Qualified Experts	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-
T1f. Other	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-
T2. Direct Hire Program Foreign Nationals (DHFN)	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-
T3. Total Direct Hire	23,117	23,932	23,974	3,034,328	-	-	-	-	3,034,328	1,100,619	4,134,947	\$126,567	\$126,567	\$172,476	0.0%	36.3%
T4. Indirect Hire Foreign Nationals (IHFN)	4	2	2	332	0	0	0	0	332	332	332	\$166,000	\$166,000	\$166,000	0.0%	0.0%
Subtotal - Total Funded (excludes OC 13)	23,121	23,934	23,976	3,034,660	-	-	-	-	3,034,660	1,100,619	4,135,279	\$126,571	\$126,571	\$172,476	0.0%	36.3%
T5. Other Object Class 13 Benefits	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T5a. USDH - Benefits for Former Employees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T5b. DHFN - Benefits for Former Employees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T5c. Voluntary Separation Incentive Pay (VSIP)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T5d. Foreign National Separation Liability Accrual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Department of the Air Force
TOTAL CIVILIAN PERSONNEL COSTS
OP-8B: OP-8 (PB)
FY 2026 President's Budget Submission
(FY 2025)

	(S in Thousands)											Rates				
	a Begin Strength	b End Strength	c FTEs	d Basic Comp	e Overtime Pay	f Holiday Pay	g Other O.C.11	e + f + g h Total Variables	d + h i Comp O.C.11	i Benefits O.C.12/13	i + j k Comp & Benefits	d/c l Basic Comp	i/c m Total Comp	k/c n Comp & Benefits	h/d o % BC Variables	j/d p % BC Benefits
Direct Funded Personnel (includes OC 13)	19,927	19,949	19,949	2,367,894	0	0	0	0	2,367,894	723,652	3,091,546	\$118,697	\$118,697	\$154,972	0.0%	30.6%
D1. US Direct Hire (USDH)	19,925	19,947	19,947	2,367,562	-	-	-	-	2,367,562	723,652	3,091,214	\$118,693	\$118,693	\$154,971	0.0%	30.6%
D1a. Senior Executive Schedule	75	75	75	13,500					13,500	4,860	18,360	\$180,000	\$180,000	\$244,800	0.0%	36.0%
D1b. General Schedule	16,594	16,616	16,616	2,106,606					2,106,606	629,708	2,736,314	\$126,782	\$126,782	\$164,679	0.0%	29.9%
D1c. Special Schedule	-	-	-	-					-	-	-	-	-	-	-	-
D1d. Wage System	3,256	3,256	3,256	247,456					247,456	89,084	336,540	\$76,000	\$76,000	\$103,360	0.0%	36.0%
D1e. Highly Qualified Experts	-	-	-	-					-	-	-	-	-	-	-	-
D1f. Other	-	-	-	-					-	-	-	-	-	-	-	-
D2. Direct Hire Program Foreign Nationals (DHFN)	-	-	-	-					-	-	-	-	-	-	-	-
D3. Total Direct Hire	19,925	19,947	19,947	2,367,562	-	-	-	-	2,367,562	723,652	3,091,214	\$118,693	\$118,693	\$154,971	0.0%	30.6%
D4. Indirect Hire Foreign Nationals (IHFN)	2	2	2	332					332	332	332	\$166,000	\$166,000	\$166,000	0.0%	0.0%
Subtotal - Direct Funded (excludes OC 13)	19,927	19,949	19,949	2,367,894	-	-	-	-	2,367,894	723,652	3,091,546	\$118,697	\$118,697	\$154,972	0.0%	30.6%
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)	4,007	4,591	4,591	565,802	0	0	0	0	565,802	0	565,802	\$123,242	\$123,242	\$123,242	0.0%	0.0%
R1. US Direct Hire (USDH)	4,007	4,591	4,591	565,802	-	-	-	-	565,802	-	565,802	\$123,242	\$123,242	\$123,242	0.0%	0.0%
R1a. Senior Executive Schedule	-	-	-	-					-	-	-	-	-	-	-	-
R1b. General Schedule	4,007	4,591	4,591	565,802					565,802		565,802	\$123,242	\$123,242	\$123,242	0.0%	0.0%
R1c. Special Schedule	-	-	-	-					-	-	-	-	-	-	-	-
R1d. Wage System	-	-	-	-					-	-	-	-	-	-	-	-
R1e. Highly Qualified Experts	-	-	-	-					-	-	-	-	-	-	-	-
R1f. Other	-	-	-	-					-	-	-	-	-	-	-	-
R2. Direct Hire Program Foreign Nationals (DHFN)	-	-	-	-					-	-	-	-	-	-	-	-
R3. Total Direct Hire	4,007	4,591	4,591	565,802	-	-	-	-	565,802	-	565,802	\$123,242	\$123,242	\$123,242	0.0%	0.0%
R4. Indirect Hire Foreign Nationals (IHFN)	-	-	-	-					-	-	-	-	-	-	-	-
Subtotal - Reimbursable Funded (excludes OC 13)	4,007	4,591	4,591	565,802	-	-	-	-	565,802	-	565,802	\$123,242	\$123,242	\$123,242	0.0%	0.0%
R5. Other Object Class 13 Benefits																
R5a. USDH - Benefits for Former Employees																
R5b. DHFN - Benefits for Former Employees																
R5c. Voluntary Separation Incentive Pay (VSIP)																
R5d. Foreign National Separation Liability Accrual																
Total Personnel (includes OC 13)	23,934	24,540	24,540	2,933,696	0	0	0	0	2,933,696	723,652	3,657,348	\$119,548	\$119,548	\$149,036	0.0%	24.7%
T1. US Direct Hire (USDH)	23,932	24,538	24,538	2,933,364	-	-	-	-	2,933,364	723,652	3,657,016	\$119,544	\$119,544	\$149,035	0.0%	24.7%
T1a. Senior Executive Schedule	75	75	75	13,500	0	0	0	0	13,500	4,860	18,360	\$180,000	\$180,000	\$244,800	0.0%	36.0%
T1b. General Schedule	20,601	21,207	21,207	2,672,408	0	0	0	0	2,672,408	629,708	3,302,116	\$126,015	\$126,015	\$153,709	0.0%	23.6%
T1c. Special Schedule	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-
T1d. Wage System	3,256	3,256	3,256	247,456	0	0	0	0	247,456	89,084	336,540	\$76,000	\$76,000	\$103,360	0.0%	36.0%
T1e. Highly Qualified Experts	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-
T1f. Other	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-
T2. Direct Hire Program Foreign Nationals (DHFN)	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-
T3. Total Direct Hire	23,932	24,538	24,538	2,933,364	-	-	-	-	2,933,364	723,652	3,657,016	\$119,544	\$119,544	\$149,035	0.0%	24.7%
T4. Indirect Hire Foreign Nationals (IHFN)	2	2	2	332	0	0	0	0	332	332	332	\$166,000	\$166,000	\$166,000	0.0%	0.0%
Subtotal - Total Funded (excludes OC 13)	23,934	24,540	24,540	2,933,696	-	-	-	-	2,933,696	723,652	3,657,348	\$119,548	\$119,548	\$149,036	0.0%	24.7%
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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Department of the Air Force TOTAL CIVILIAN PERSONNEL COSTS OP-8B: OP-8 (PB) FY 2026 President's Budget Submission (FY 2026)															
	(\$ in Thousands)											d/c	i/c	Rates	j/d
	a	b	c	d	e	f	g	e + f + g	d + h	i	i + j	d/c	i/c	k/c	j/d
	Begin	End	FTEs	Basic	Overtime	Holiday	Other	Total	Comp	Benefits	Comp	Basic	Total	Comp	% BC
	Strength	Strength		Comp	Pay	Pay	O.C.11	Variables	O.C.11	O.C.12/13	& Benefits	Comp	Comp	& Benefits	% BC
Direct Funded Personnel (includes OC 13)	19,949	17,503	17,503	2,272,636	0	0	0	0	2,272,636	775,242	3,047,878	\$129,843	\$129,843	\$174,135	0.0%
D1. US Direct Hire (USDH)	19,947	17,501	17,501	2,272,297	-	-	-	-	2,272,297	775,242	3,047,539	\$129,838	\$129,838	\$174,135	0.0%
D1a. Senior Executive Schedule	75	75	75	18,750	-	-	-	-	18,750	4,588	23,338	\$250,000	\$250,000	\$311,173	0.0%
D1b. General Schedule	16,616	14,437	14,437	1,973,531	-	-	-	-	1,973,531	678,894	2,652,425	\$136,700	\$136,700	\$183,724	0.0%
D1c. Special Schedule	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D1d. Wage System	3,256	2,989	2,989	280,016	-	-	-	-	280,016	91,760	371,776	\$93,682	\$93,682	\$124,381	0.0%
D1e. Highly Qualified Experts	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D1f. Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D2. Direct Hire Program Foreign Nationals (DHFN)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D3. Total Direct Hire	19,947	17,501	17,501	2,272,297	-	-	-	-	2,272,297	775,242	3,047,539	\$129,838	\$129,838	\$174,135	0.0%
D4. Indirect Hire Foreign Nationals (IHFN)	2	2	2	339	-	-	-	-	339	-	-	\$169,500	\$169,500	\$169,500	0.0%
Subtotal - Direct Funded (excludes OC 13)	19,949	17,503	17,503	2,272,636	-	-	-	-	2,272,636	775,242	3,047,878	\$129,843	\$129,843	\$174,135	0.0%
D5. Other Object Class 13 Benefits	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D5a. USDH - Benefits for Former Employees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D5b. DHFN - Benefits for Former Employees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D5c. Voluntary Separation Incentive Pay (VSIP)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D5d. Foreign National Separation Liability Accrual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reimbursable Funded Personnel (includes OC 13)	4,591	5,082	5,082	577,439	0	0	0	0	577,439	0	577,439	\$113,624	\$113,624	\$113,624	0.0%
R1. US Direct Hire (USDH)	4,591	5,082	5,082	577,439	-	-	-	-	577,439	-	577,439	\$113,624	\$113,624	\$113,624	0.0%
R1a. Senior Executive Schedule	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R1b. General Schedule	4,591	5,082	5,067	576,089	-	-	-	-	576,089	-	576,089	\$113,694	\$113,694	\$113,694	0.0%
R1c. Special Schedule	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R1d. Wage System	-	-	15	1,350	-	-	-	-	1,350	-	1,350	\$90,000	\$90,000	\$90,000	0.0%
R1e. Highly Qualified Experts	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R1f. Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R2. Direct Hire Program Foreign Nationals (DHFN)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R3. Total Direct Hire	4,591	5,082	5,082	577,439	-	-	-	-	577,439	-	577,439	\$113,624	\$113,624	\$113,624	0.0%
R4. Indirect Hire Foreign Nationals (IHFN)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal - Reimbursable Funded (excludes OC 13)	4,591	5,082	5,082	577,439	-	-	-	-	577,439	-	577,439	\$113,624	\$113,624	\$113,624	0.0%
R5. Other Object Class 13 Benefits	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R5a. USDH - Benefits for Former Employees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R5b. DHFN - Benefits for Former Employees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R5c. Voluntary Separation Incentive Pay (VSIP)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R5d. Foreign National Separation Liability Accrual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Personnel (includes OC 13)	24,540	22,585	22,585	2,850,075	0	0	0	0	2,850,075	775,242	3,625,317	\$126,193	\$126,193	\$160,519	0.0%
T1. US Direct Hire (USDH)	24,538	22,583	22,583	2,849,736	-	-	-	-	2,849,736	775,242	3,624,978	\$126,189	\$126,189	\$160,518	0.0%
T1a. Senior Executive Schedule	75	75	75	18,750	0	0	0	0	18,750	4,588	23,338	\$250,000	\$250,000	\$311,173	0.0%
T1b. General Schedule	21,207	19,519	19,504	2,549,620	0	0	0	0	2,549,620	678,894	3,228,514	\$130,723	\$130,723	\$165,531	0.0%
T1c. Special Schedule	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-
T1d. Wage System	3,256	2,989	3,004	281,366	0	0	0	0	281,366	91,760	373,126	\$93,664	\$93,664	\$124,210	0.0%
T1e. Highly Qualified Experts	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-
T1f. Other	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-
T2. Direct Hire Program Foreign Nationals (DHFN)	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-
T3. Total Direct Hire	24,538	22,583	22,583	2,849,736	-	-	-	-	2,849,736	775,242	3,624,978	\$126,189	\$126,189	\$160,518	0.0%
T4. Indirect Hire Foreign Nationals (IHFN)	2	2	2	339	0	0	0	0	339	0	339	\$169,500	\$169,500	\$169,500	0.0%
Subtotal - Total Funded (excludes OC 13)	24,540	22,585	22,585	2,850,075	-	-	-	-	2,850,075	775,242	3,625,317	\$126,193	\$126,193	\$160,519	0.0%
T5. Other Object Class 13 Benefits	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T5a. USDH - Benefits for Former Employees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T5b. DHFN - Benefits for Former Employees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T5c. Voluntary Separation Incentive Pay (VSIP)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T5d. Foreign National Separation Liability Accrual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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*All figures in this exhibit are for the FY 2026 discretionary appropriations
President's Budget request unless otherwise noted.*

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ACRONYMS

GENERAL ACRONYMS

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

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

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

BASE / ORGANIZATIONAL ACRONYMS

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

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

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CONTRACT METHOD / TYPE ACRONYMS

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

CONTRACTED BY ACRONYMS

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

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

IDENTIFICATION CODES

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force **Date:** June 2025

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force / BA 1: Basic Research</i>	R-1 Program Element (Number/Name) PE 0601102F / <i>Defense Research Sciences</i>

COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
Total Program Element	0.000	347.393	361.930	302.716	0.000	302.716	-	-	-	-	-	-
613001: <i>Physics and Electronics</i>	0.000	92.062	102.282	87.303	0.000	87.303	-	-	-	-	-	-
613002: <i>Aerospace, Chemical and Material Sciences</i>	0.000	105.184	107.377	92.045	0.000	92.045	-	-	-	-	-	-
613003: <i>Mathematics, Information and Life Sciences</i>	0.000	108.309	110.237	93.305	0.000	93.305	-	-	-	-	-	-
613004: <i>Education and Outreach</i>	0.000	34.165	34.282	25.171	0.000	25.171	-	-	-	-	-	-
613005: <i>STEM Pipeline Development</i>	0.000	7.673	7.752	4.892	0.000	4.892	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

Defense Research Sciences consists of basic research activities in academia and industry along with research performed in the Department of the Air Force, including the Air Force Research Laboratory, Air Force Institute of Technology, and the United States Air Force Academy. This program supports basic broad-based scientific and engineering research in areas critical to Department of the Air Force weapon, sensor, and support systems. All research areas are subject to long-range planning and technical review by both Department of the Air Force and tri-Service scientific planning groups. Efforts in this program have been coordinated through the Department of Defense Science and Technology Executive Committee process to harmonize efforts and eliminate duplication.

The Air Force Research Laboratory (AFRL) is focused on high-impact, multi-domain science & technology (S&T) solutions that drive innovation now while laying the groundwork for the Air and Space Force to win the future fight. AFRL effectively synchronizes the Department of the Air Force (DAF) S&T enterprise and workforce to align towards the most consequential DAF priorities and accelerate the delivery of game-changing S&T.

This program includes funding for the requisite DAF Science & Engineering (S&E) and mission enabling civilian workforce with the necessary technical competencies to develop, manage, and deliver science & technology capabilities. The use of program funds in this program element is in conjunction with the civilian pay expenses budgeted in the following program elements: 1206601SF, 0602020F, 0602102F, 0602202F, 0602203F, 0602204F, 0602298F, 0602336F, 0602602F, 0602605F, 0602788F, and 0603680F. In FY 2026, \$33.376 million is budgeted in this program for 145 direct Full-Time Equivalent (FTE) civilians. The Air Force Research Laboratory (AFRL) utilizes 10 USC 4091, "Authorities for certain positions at science and technology reinvention laboratories" to manage the workforce strength, structure, positions, and compensation without regard to any limitation on appointments, positions, or funding in a manner consistent with the budget.

This program element may include necessary expenses to support the operation and maintenance of facilities to manage, execute, and deliver science and technology capabilities.

Funds in this program element may be used to investigate specified science advancements in air, space and/or cyber domains.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force				Date: June 2025		
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force / BA 1: Basic Research		R-1 Program Element (Number/Name) PE 0601102F / Defense Research Sciences				
This program is in Budget Activity 1, Basic Research because this budget activity includes scientific study and experimentation directed toward increasing fundamental knowledge and understanding in those fields of the physical, engineering, environmental, and life sciences related to long-term national security needs.						
B. Program Change Summary (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Previous President's Budget		401.486	361.930	308.870	0.000	308.870
Current President's Budget		347.393	361.930	302.716	0.000	302.716
Total Adjustments		-54.093	0.000	-6.154	0.000	-6.154
• Congressional General Reductions		-2.000	0.000			
• Congressional Directed Reductions		-20.100	0.000			
• Congressional Rescissions		0.000	0.000			
• Congressional Adds		0.000	0.000			
• Congressional Directed Transfers		0.000	0.000			
• Reprogrammings		-6.965	0.000			
• SBIR/STTR Transfer		-9.772	0.000			
• Other Adjustments		-15.256	0.000	-6.154	0.000	-6.154
Change Summary Explanation						
In FY 2024, decrease of \$20.100 million was due to a Congressional directed transfer to RDT&E, Space Force, PE 0601102SF, Defense Research Sciences, for space unique S&T						
In FY 2024, decrease of \$15.255 million in Other Adjustments was due to realignment of funds to PE 0602212F, Defense Laboratories R&D Projects, to implement the Department of Defense (DoD) Funding Laboratory Enhancements Across Four Categories (FLEX-4) authority under 10 U.S.C Section 4123.						
In FY 2026, the budget decreased by \$4.206 million due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency. The FY 2026 request was reduced by \$0.819 million for Advisory and Assistance Services to promote efficiencies and advance the policies of the Administration in alignment with Executive Order 14222, "Implementing the President's Department of Government Efficiency Cost Efficiency Initiative." The FY 2026 request was reduced by \$3.647 million for civilian personnel to optimize the workforce in compliance with Executive Order 14210, "Implementing the President's Department of Government Efficiency Workforce Optimization Initiative."						

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 1					R-1 Program Element (Number/Name) PE 0601102F / Defense Research Sciences				Project (Number/Name) 613001 / Physics and Electronics			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
613001: Physics and Electronics	0.000	92.062	102.282	87.303	0.000	87.303	-	-	-	-	-	-
A. Mission Description and Budget Item Justification												
Basic research in the Physics and Electronics Project seeks to enable revolutionary advances and expand the fundamental knowledge supporting technologies critical to the future of the Department of the Air Force. Research prioritizes high-risk, high-reward, game-changing scientific breakthroughs essential for future leaps in warfighter system performance, functionality, reliability, and survivability while simultaneously reducing component and system power, size, mass, and life cycle costs. Major areas being investigated in this project are complex electronics and fundamental quantum processes; plasma physics and high energy density non-equilibrium processes; and lasers and optics, electromagnetics, communication, and signal processing. While the following specific efforts are the focus of the project, there is interest in exploring novel ideas that may bridge these major efforts as well as those in the other projects within this program.												
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Title: Complex Electronics and Fundamental Quantum Processes								42.948	49.454	42.212	0.000	42.212
Description: Scientific focus areas are atomic and molecular physics, quantum information science, photonics, condensed matter physics, gigahertz-terahertz electronics, semiconductor and electromagnetic materials, and optoelectronics.												
FY 2025 Plans:												
- Explore a wide range of complex materials and devices, including non-linear optical materials, photonics, optoelectronics, metamaterials, cathodes, dielectric and magnetic materials, memristive systems, new classes of high-temperature superconductors, quantum dots, quantum wells, and graphene.												
- Conduct research related to generating and controlling quantum states, such as superposition and entanglement, in photonic systems, quantum dots and defects in solids, and ultracold atoms and molecules.												
FY 2026 Base Plans:												
- Continue exploring a wide range of complex materials and devices, including non-linear optical materials, photonics, optoelectronics, metamaterials, cathodes, dielectric and magnetic materials, memristive systems, topological materials, strongly correlated materials, and two-dimensional materials including graphene.												
- Continue exploration related to generating and controlling quantum states, such as superposition and entanglement, in photonic systems, quantum dots and defects in solids, and ultracold atoms and molecules.												
FY 2026 OOC Plans:												
Not Applicable												
FY 2025 to FY 2026 Increase/Decrease Statement:												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force				Date: June 2025		
Appropriation/Budget Activity 3600 / 1		R-1 Program Element (Number/Name) PE 0601102F / Defense Research Sciences		Project (Number/Name) 613001 / Physics and Electronics		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
FY 2026 decreased compared to FY 2025 by \$7.242 million due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency. This will result in approximately 30 fewer grants awarded in this science area.						
Title: Plasma Physics and High Energy Density Non-Equilibrium Processes		14.908	15.748	13.441	0.000	13.441
Description: Scientific focus areas are high-energy lasers, plasma and electro-energetic physics.						
FY 2025 Plans: - Explore a wide range of activities characterized by processes sufficiently energetic to require understanding and managing plasma phenomenology and the non-linear response of materials to high electric and magnetic fields. - Explore plasma discharges, radio frequency propagation, radio frequency-plasma interaction, and high-power, beam-driven microwave devices.						
FY 2026 Base Plans: - Continue exploring a wide range of activities characterized by processes sufficiently energetic to require understanding and managing plasma phenomenology and the non-linear response of materials to high electric and magnetic fields. - Continue exploring high-energy lasers, plasma discharges, radio frequency propagation, radio frequency-plasma interaction, and high-power, beam-driven microwave devices.						
FY 2026 OOC Plans: Not Applicable						
FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$2.306 million due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency. This will result in approximately 9 fewer grants in this science area.						
Title: Lasers and Optics, Electromagnetics, Communication and Signal Processing		34.206	37.080	31.650	0.000	31.650
Description: Scientific focus areas are physical mathematics and applied analysis, novel computational methods, electromagnetics and wave propagation in complex media, ultra-fast dynamics, for revolutionary approaches to remote sensing and imaging physics, and surveillance and navigation.						
FY 2025 Plans:						

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force				Date: June 2025		
Appropriation/Budget Activity 3600 / 1		R-1 Program Element (Number/Name) PE 0601102F / <i>Defense Research Sciences</i>		Project (Number/Name) 613001 / <i>Physics and Electronics</i>		
B. Accomplishments/Planned Programs (\$ in Millions)						
		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- Explore all aspects of producing and receiving electromagnetic and electro-optical signals, as well as their propagation through complex media, including adaptive optics and optical imaging. - Investigate aspects of the phenomenology of lasers including high energy lasers, non-linear optics and ultra-short pulse laser science. - Conduct sophisticated mathematics and algorithm development for extracting information from complex and/or sparse signals. <i>FY 2026 Base Plans:</i> - Continue exploring all aspects of producing and receiving electromagnetic and electro-optical signals, as well as their propagation through complex media, including adaptive optics and optical imaging. - Continue to investigate aspects of the phenomenology of lasers including non-linear optics and ultra-short pulse laser science. - Continue sophisticated mathematics and algorithm development for extracting information from complex and/or sparse signals. <i>FY 2026 OOC Plans:</i> Not Applicable <i>FY 2025 to FY 2026 Increase/Decrease Statement:</i> FY 2026 decreased compared to FY 2025 by \$5.430 million due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency. This will result in approximately 22 fewer grants awarded in this science area.						
Accomplishments/Planned Programs Subtotals		92.062	102.282	87.303	0.000	87.303
C. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						
D. Acquisition Strategy						
Not Applicable						

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 1					R-1 Program Element (Number/Name) PE 0601102F / Defense Research Sciences				Project (Number/Name) 613002 / Aerospace, Chemical and Material Sciences			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
613002: Aerospace, Chemical and Material Sciences	0.000	105.184	107.377	92.045	0.000	92.045	-	-	-	-	-	-
A. Mission Description and Budget Item Justification												
Basic research in the Aerospace, Chemical, and Materials Sciences Project seeks to enable revolutionary advances and expand the fundamental knowledge supporting technologies critical to the future of the Department of the Air Force. Research stresses high-risk, high-reward, game-changing scientific breakthroughs essential for future leaps in warfighter system performance, functionality, reliability, and survivability while simultaneously reducing component and system power, size, mass, and life cycle costs. Research topics include: aero-structure interactions and control; energy, power, and propulsion; complex materials and structures; and cross-disciplinary research reflecting the highly integrated nature of future weapon systems. While the following specific efforts are the focus of the project there is interest in exploring novel ideas that may bridge these major efforts as well as those in other projects within this program.												
B. Accomplishments/Planned Programs (\$ in Millions)							FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	
Title: Aero-Structure Interactions and Control							32.458	36.236	31.062	0.000	31.062	
Description: Scientific focus areas are high temperature aerospace materials, non-equilibrium aerothermodynamics and chemistry, unsteady, compressible flow turbulence, multiscale fluid-material interactions, and flow control.												
FY 2025 Plans:												
- Investigate the characterization, modeling, and exploitation of interactions between the unsteady aerodynamic flow field and the dynamic air vehicle structure to enable enhanced performance in next-generation Department of the Air Force systems.												
- Explore the synergy gained from an interdisciplinary look at multiple technologies and the integration of core disciplines of fluid mechanics, high-performance structures, and thermodynamics.												
FY 2026 Base Plans:												
- Continue investigating the characterization, modeling, and exploitation of interactions between the unsteady aerodynamic flow field and the dynamic air vehicle structure to enable enhanced performance in next-generation Department of the Air Force systems.												
- Continue to explore the synergy gained from an interdisciplinary integration of fluid mechanics, high-performance structures, and thermodynamics research.												
FY 2026 OOC Plans:												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025			
Appropriation/Budget Activity 3600 / 1		R-1 Program Element (Number/Name) PE 0601102F / Defense Research Sciences		Project (Number/Name) 613002 / Aerospace, Chemical and Material Sciences		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Not Applicable						
FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$5.174 million due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency. This will result in approximately 21 fewer grants awarded in this science area.						
Title: Energy, Power, and Propulsion Description: Scientific focus areas are thermal control, theoretical chemistry, molecular dynamics, power and propulsion, and combustion and diagnostics. FY 2025 Plans: - Explore scientific advances by integrating core disciplines of combustion, plasma dynamics, chemistry, hydrodynamics, structural dynamics, and multi-fidelity simulations. - Investigate processes associated with the generation, storage, and utilization of energy, specifically for Department of the Air Force systems including developing novel energetic materials as well as understanding optimizing and controlling combustion processes. FY 2026 Base Plans: - Continue exploring scientific advances by integrating core disciplines of combustion, plasma dynamics, chemistry, hydrodynamics, structural dynamics, and multi-fidelity simulations. - Continue to investigate processes associated with the generation, storage, and utilization of energy, specifically for Department of the Air Force systems including developing novel energetic materials as well as understanding optimizing and controlling combustion processes. FY 2026 OOC Plans: Not Applicable FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$4.464 million due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency. This will result in approximately 18 fewer grants awarded in this science area.		31.907	31.263	26.799	0.000	26.799
Title: Complex Materials and Structures		40.819	39.878	34.184	0.000	34.184

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force				Date: June 2025		
Appropriation/Budget Activity 3600 / 1		R-1 Program Element (Number/Name) PE 0601102F / <i>Defense Research Sciences</i>		Project (Number/Name) 613002 / <i>Aerospace, Chemical and Material Sciences</i>		
B. Accomplishments/Planned Programs (\$ in Millions)						
		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Description: Scientific focus areas are design, manufacturing, and dynamics and control of multifunctional materials and microsystems, multi-scale mechanics, diagnostics and prognosis, and physio-chemistry of novel organic materials. FY 2025 Plans: - Investigate multifunctional materials and structures composed of different classes of materials, both organic and inorganic, that can adapt to environmental constraints or mission requirements. - Explore complex materials, microsystems, and structures that incorporate hierarchical design and functionality from the nanoscale through the mesoscale, ultimately leading to controlled, well-understood material or structural behavior capable of dynamic functionality and/or performance characteristics to enhance mission versatility. FY 2026 Base Plans: - Continue investigating multifunctional materials and structures composed of different classes of materials, both organic and inorganic, that can adapt to environmental constraints or mission requirements. - Continue to explore complex materials, microsystems, and structures that incorporate hierarchical design and functionality from the nanoscale through the mesoscale, ultimately leading to controlled, well-understood material or structural behavior capable of dynamic functionality and/or performance characteristics to enhance mission versatility. FY 2026 OOC Plans: Not Applicable FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$5.693 million due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency. This will result in approximately 23 fewer grants awarded in this science area.						
Accomplishments/Planned Programs Subtotals		105.184	107.377	92.045	0.000	92.045
C. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025
Appropriation/Budget Activity 3600 / 1	R-1 Program Element (Number/Name) PE 0601102F / Defense Research Sciences	Project (Number/Name) 613002 / Aerospace, Chemical and Material Sciences
D. Acquisition Strategy Not Applicable		

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 1					R-1 Program Element (Number/Name) PE 0601102F / Defense Research Sciences				Project (Number/Name) 613003 / Mathematics, Information and Life Sciences			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
613003: Mathematics, Information and Life Sciences	0.000	108.309	110.237	93.305	0.000	93.305	-	-	-	-	-	-
A. Mission Description and Budget Item Justification												
Basic research in the Mathematics, Information Sciences, and Life Sciences Project seeks to expand fundamental knowledge and enable revolutionary advances and supporting technologies critical to the future of the Department of the Air Force. Major areas being investigated in this project are data fusion, machine learning and artificial intelligence, information and complex networks, cyber-security, autonomous decision making, dynamical systems, optimization and control, and natural materials and systems. While the following are specific sub-areas within this project, there is a continuing interest to explore novel ideas to bridge disciplines within this program.												
B. Accomplishments/Planned Programs (\$ in Millions)							FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	
Title: Information and Complex Networks							27.065	24.047	20.354	0.000	20.354	
Description: Scientific focus areas are information operations and security, data and information fusion, advanced computing, artificial intelligence and complex networks.												
FY 2025 Plans:												
- Design and analyze techniques to enable reliable and secure exchange of information and predictable operation of networks and systems, including hardware and software interactions.												
- Investigate traditional aspects of information assurance with an emphasis on the underlying mathematics of secure-by-design architectures of networked communications and neural information processing.												
- Analyze, optimize, and design multi-scale networks with resilient features against noise and corruption from difficult environments and adversarial operations, using rigorous mathematical models of information exchange, physical operations, and human-machine interactions.												
- Develop new computing approaches and algorithms for network-of-network information processing at the speed of warfare and new mathematical approaches for predictive, multi-scale and multi-physics simulations of Department of the Air Force systems and systems-of-systems in realistic environments.												
FY 2026 Base Plans:												
- Continue designing and analyzing techniques to enable reliable and secure exchange of information and predictable operation of networks and systems, including hardware and software interactions.												
- Continue to investigate traditional aspects of information assurance with an emphasis on the underlying mathematics of secure-by-design architectures of networked communications and neural information processing.												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025			
Appropriation/Budget Activity 3600 / 1	R-1 Program Element (Number/Name) PE 0601102F / Defense Research Sciences	Project (Number/Name) 613003 / Mathematics, Information and Life Sciences				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- Continue to analyze, optimize, and design multi-scale networks with resilient features against noise and corruption from difficult environments and adversarial operations, using rigorous mathematical models of information exchange, physical operations, and human-machine interactions. - Continue to develop new computing approaches and algorithms for network-of-network information processing at the speed of warfare and new mathematical approaches for predictive, multi-scale and multi-physics simulations of Department of the Air Force systems and systems-of-systems in realistic environments. FY 2026 OOC Plans: Not Applicable FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$3.694 million due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency. This will result in approximately 15 fewer grants awarded in this science area.						
Title: Decision Making Description: Scientific focus areas are mathematical modeling of cognition and decision making, development and testing of advanced representations and processes for higher-level artificial intelligence, trust between humans and autonomous agents, mixed human-machine decision making, and computational social science for asymmetric threat detection and predictive largescale influence. FY 2025 Plans: - Investigate new mathematical laws, scientific principles, and robust algorithms that underlie intelligent, mixed human-machine decision-making to achieve accurate real-time integration of human expertise and knowledge into a machine-based battlespace network. - Develop new mathematical models for information capture; object, scene and relation identification; and multi-level reasoning and meta-learning. - Advance the critical knowledge base in modeling of individual and group cognitive processing and decision making, and construct advanced methodologies for predictive, verifiable simulations of large-scale socio-cultural and human-machine hybrid networks. FY 2026 Base Plans: - Continue investigating new mathematical laws, scientific principles, and robust algorithms that underlie intelligent, mixed human-machine decision-making to achieve accurate real-time integration of human expertise and knowledge into a machine-based battlespace network.		21.692	24.150	20.441	0.000	20.441

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025			
Appropriation/Budget Activity 3600 / 1		R-1 Program Element (Number/Name) PE 0601102F / Defense Research Sciences		Project (Number/Name) 613003 / Mathematics, Information and Life Sciences		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- Continue to develop new mathematical models for information capture; object, scene and relation identification; and multi-level reasoning and meta-learning. - Continue to advance the critical knowledge base in modeling of individual and group cognitive processing and decision making, and construct advanced methodologies for predictive, verifiable simulations of large-scale socio-cultural and human-machine hybrid networks. FY 2026 OOC Plans: Not Applicable FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$3.709 million due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency. This will result in approximately 15 fewer grants awarded in this science area.						
Title: Dynamical Systems, Optimization, and Control Description: Scientific focus areas are computer models of dynamical data and communication networks, data-fusion, dynamics and control theory for multi-scale and complex networks, and mathematics of distributed optimization in uncertain, variable, continuous and discrete networked systems. Includes the development of advanced computing architectures for solving optimization and data-fusion problems in real time and by embedded processors in autonomous or semi-autonomous platforms. FY 2025 Plans: - Develop new scientific concepts supported by rigorous analysis for advancing the science of autonomy and promoting the understanding necessary to analyze and design complex multi-scale systems as well as to provide guaranteed levels of performance. - Develop novel adaptive control strategies for coordinating heterogeneous, autonomous, or semiautonomous aerospace vehicles in uncertain, information rich, dynamically changing, adversarial, and networked environments. FY 2026 Base Plans: - Continue developing new scientific concepts supported by rigorous analysis for advancing the science of autonomy and promoting the understanding necessary to analyze and design complex multi-scale systems as well as to provide guaranteed levels of performance.		28.149	31.323	26.512	0.000	26.512

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025			
Appropriation/Budget Activity 3600 / 1		R-1 Program Element (Number/Name) PE 0601102F / Defense Research Sciences		Project (Number/Name) 613003 / Mathematics, Information and Life Sciences		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- Continue to develop novel adaptive control strategies for coordinating heterogeneous, autonomous, or semiautonomous aerospace vehicles in uncertain, information rich, dynamically changing, adversarial, and networked environments. FY 2026 OOC Plans: Not Applicable FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$4.811 million due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency. This will result in approximately 20 fewer grants awarded in this science area.						
Title: Natural Materials and Systems Description: Scientific focus areas are natural materials and nature inspired systems, human performance and biosystems, cognitive neuroscience and biophysics. FY 2025 Plans: - Investigate multidisciplinary approaches for studying, using, mimicking, synthesizing, and adapting to the ways natural systems are built, assembled and organized, and functioning to accomplish their objectives. - Develop a fundamental understanding of bio-chemical mechanisms and control procedures for the production and manufacture of natural materials and develop reverse-engineering approaches to optimize the bio-chemical functionality. - Develop approaches to adapt, blend, and mimic existing natural sensory systems and neural systems of varying complexity, to add existing capabilities to these organisms and design in-silico replicas with similar or advanced capabilities. FY 2026 Base Plans: - Continue investigating multidisciplinary approaches for studying, using, mimicking, synthesizing, and adapting to the ways natural systems are built, assembled and organized, and functioning to accomplish their objectives. - Continue to develop a fundamental understanding of bio-chemical mechanisms and control procedures for the production and manufacture of natural materials and develop reverse-engineering approaches to optimize the bio-chemical functionality.		31.403	30.717	25.998	0.000	25.998

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 1	R-1 Program Element (Number/Name) PE 0601102F / <i>Defense Research Sciences</i>	Project (Number/Name) 613003 / <i>Mathematics, Information and Life Sciences</i>			
B. Accomplishments/Planned Programs (\$ in Millions)					
	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- Continue to develop approaches to adapt, blend, and mimic existing natural sensory systems and neural systems of varying complexity, to add existing capabilities to these organisms and design in-silico replicas with similar or advanced capabilities. <i>FY 2026 OOC Plans:</i> Not Applicable <i>FY 2025 to FY 2026 Increase/Decrease Statement:</i> FY 2026 decreased compared to FY 2025 by \$4.719 million due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency. This will result in approximately 19 fewer grants awarded in this science area.					
Accomplishments/Planned Programs Subtotals	108.309	110.237	93.305	0.000	93.305
C. Other Program Funding Summary (\$ in Millions)					
N/A					
Remarks					
D. Acquisition Strategy					
Not Applicable					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 1					R-1 Program Element (Number/Name) PE 0601102F / Defense Research Sciences				Project (Number/Name) 613004 / Education and Outreach			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
613004: Education and Outreach	0.000	34.165	34.282	25.171	0.000	25.171	-	-	-	-	-	-
A. Mission Description and Budget Item Justification												
The major efforts in the Science and Technology (S&T) Education and Outreach Project are to facilitate interactions between the international and domestic research communities and Department of the Air Force researchers, and to develop scientists and engineers with an awareness of Department of the Air Force basic research priorities. These professional interactions and collaborations benefit the Department of the Air Force by increasing awareness of basic research priorities in the research community as a whole and attracting talented scientists and engineers to address Department of the Air Force needs. International interactions foster relationships with scientific partners and leverage international expertise in nascent scientific developments. This project also seeks to enhance interactions with Historically Black Colleges and Universities (HBCU), Hispanic-Serving Institutions, and other institutions, in accordance with 10 U.S.C. 4144, Research and Educational Programs and Activities: Historically Black Colleges and Universities and Minority-serving Institutions of Higher Education.												
B. Accomplishments/Planned Programs (\$ in Millions)							FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	
Title: Leveraging International S&T for DAF Advantage							14.594	17.055	15.388	0.000	15.388	
Description: Foster international basic research discovery by supporting direct interchanges with a broad range of key international researchers and communities. Identify and leverage international scientific advances when appropriate.												
FY 2025 Plans: - Fund disruptive basic research opportunities at international universities and organizations discovered by engaging with and leveraging the worldwide research community. - Explore foreign investments and influence premier scientific leaders on specific topics of interest to the Department of the Air Force. - Pursue access to and enable transition of fundamental scientific discoveries relevant to the Department of the Air Force that are not being addressed in U.S. universities. - Support international engagements by scientists and high-level DoD fundamental science delegations, providing primary interface to coordinate international science and technology participation among DoD organizations.												
FY 2026 Base Plans: - Continue funding disruptive basic research opportunities at international universities and organizations discovered by engaging with and leveraging the worldwide research community. - Continue to explore foreign investments and influence premier scientific leaders on specific topics of interest to the Department of the Air Force.												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025			
Appropriation/Budget Activity 3600 / 1		R-1 Program Element (Number/Name) PE 0601102F / Defense Research Sciences	Project (Number/Name) 613004 / Education and Outreach			
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- Continue to pursue access to and enable transition of fundamental scientific discoveries relevant to the Department of the Air Force that are not being addressed in U.S. universities. - Continue to support international engagements by scientists and high-level DoD fundamental science delegations, providing primary interface to coordinate international science and technology participation among DoD organizations. FY 2026 OOC Plans: Not Applicable FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$1.667 million due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency. This will result in approximately 17 fewer international grants awarded.						
Title: Building the Pipeline of DAF S&T Talent Description: Strengthen science, mathematics, and engineering research and infrastructure in the U.S., thereby strengthening current and future Department of the Air Force S&T capabilities. FY 2025 Plans: - Identify, recruit, and increase opportunities for new investigators to participate in critical Department of the Air Force research. - Support basic science, mathematics, and engineering research efforts with Historically Black Colleges and Universities (HBCU), Hispanic-Serving Institutions, and other institutions. - Focus investment and outreach to HBCUs to include funding in microelectronics, materials, energy, aerospace, and chemistry and other fields of importance to the Department of the Air Force. FY 2026 Base Plans: - Continue identifying, recruiting, and increasing opportunities for new investigators to participate in critical Department of the Air Force research. - Continue to support basic science, mathematics, and engineering research efforts to include funding in microelectronics, materials, energy, aerospace, quantum science, and other fields of importance to the Department of the Air Force with Historically Black Colleges and Universities (HBCU), Hispanic-Serving Institutions, and other institutions. FY 2026 OOC Plans:		19.571	17.227	9.783	0.000	9.783

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025			
Appropriation/Budget Activity 3600 / 1		R-1 Program Element (Number/Name) PE 0601102F / Defense Research Sciences		Project (Number/Name) 613004 / Education and Outreach		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Not Applicable						
FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$7.444 million due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency.						
Accomplishments/Planned Programs Subtotals		34.165	34.282	25.171	0.000	25.171
C. Other Program Funding Summary (\$ in Millions) N/A						
Remarks						
D. Acquisition Strategy Not Applicable						

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 1					R-1 Program Element (Number/Name) PE 0601102F / Defense Research Sciences				Project (Number/Name) 613005 / STEM Pipeline Development			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
613005: STEM Pipeline Development	0.000	7.673	7.752	4.892	0.000	4.892	-	-	-	-	-	-
A. Mission Description and Budget Item Justification												
The major efforts in the Science, Technology, Engineering, and Mathematics (STEM) Pipeline Development Project are initiatives to support STEM education and outreach activities for kindergarten through 12th grade (K-12) students, and to support activities that encourage elementary, middle, and high-school youth to develop an interest in, and pursue, higher education and employment in the science, mathematics, and engineering career fields. These initiatives benefit the Department of the Air Force by cultivating a progressive pipeline of highly-trained and knowledgeable STEM professionals aimed at filling Department of the Air Force STEM workforce needs. This project seeks to cultivate STEM opportunities across the Department of the Air Force by supporting education and outreach activities that promote foundational knowledge building and experiential learning to inspire young students to pursue STEM-related career fields of critical importance to the Department of the Air Force.												
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Title: DAF K-12 STEM Pipeline Development								5.660	5.687	2.786	0.000	2.786
Description: Foster Science, Technology, Engineering, and Mathematics (STEM) education and outreach activities for kindergarten through 12th grade (K-12) students and their educators to encourage an interest in STEM, provide exposure to STEM careers and opportunities, and to inspire the pursuit of higher education and employment in the Department of the Air Force science, mathematics, and engineering fields.												
FY 2025 Plans:												
- Develop, institutionalize, and coordinate K-12 STEM outreach activities throughout the Department of the Air Force.												
- Leverage ongoing partnerships with industry, schools, and other government agencies, in order to enhance the effectiveness of investments in outreach that promotes foundational knowledge building, experiential learning, and STEM workforce development.												
FY 2026 Base Plans:												
- Continue developing, institutionalizing, and coordinating K-12 STEM outreach activities throughout the Department of the Air Force.												
- Continue leveraging ongoing partnerships with industry, schools, and other government agencies to enhance the effectiveness of investments in outreach that promotes foundational knowledge building, experiential learning, and STEM workforce development.												
FY 2026 OOC Plans:												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force				Date: June 2025		
Appropriation/Budget Activity 3600 / 1		R-1 Program Element (Number/Name) PE 0601102F / Defense Research Sciences		Project (Number/Name) 613005 / STEM Pipeline Development		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Not Applicable						
FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$2.901 million due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency.						
Title: Leadership Experience Growing Apprenticeships Committed to Youth (LEGACY) Description: Attract, inspire and develop the next generation of our nation's scientific and technical workforce, thereby strengthening future Department of the Air Force S&T capabilities. This is accomplished through middle school to college craftsman camps and apprenticeships that develop and connect future Science, Technology, Engineering, and Mathematics (STEM) talent with DAF STEM workforce opportunities and careers. FY 2025 Plans: - Identify, cultivate, and increase STEM opportunities across the Department of the Air Force through a progressive pipeline aimed at filling future STEM workforce needs. - Support STEM activities that identify and retain talented elementary, middle school, high-school, and undergraduate students to develop a future talent bench with competencies in the emerging technology areas that will form the future STEM workforce. FY 2026 Base Plans: - Continue identifying, cultivating, and increasing STEM opportunities across the Department of the Air Force through a progressive pipeline aimed at filling future STEM workforce needs. - Continue supporting STEM activities that identify and retain talented elementary, middle school, high-school, and undergraduate students to develop a future talent bench with competencies in the emerging technology areas that will form the future STEM workforce. FY 2026 OOC Plans: Not Applicable FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$0.041 million due to adjustments to the Science and Technology portfolio.		2.013	2.065	2.106	0.000	2.106
Accomplishments/Planned Programs Subtotals		7.673	7.752	4.892	0.000	4.892

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025
Appropriation/Budget Activity 3600 / 1	R-1 Program Element (Number/Name) PE 0601102F / Defense Research Sciences	Project (Number/Name) 613005 / STEM Pipeline Development
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy Not Applicable		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force **Date:** June 2025

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 1: Basic Research</i>					R-1 Program Element (Number/Name) PE 0601103F / <i>University Research Initiatives</i>							
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
Total Program Element	0.000	172.154	146.372	94.121	0.000	94.121	-	-	-	-	-	-
615094: <i>University Research Initiatives</i>	0.000	172.154	146.372	94.121	0.000	94.121	-	-	-	-	-	-

Note

The National Defense Science and Engineering Graduate (NDSEG) Fellowship Program contract will be restructured to fund current year academic costs only instead of funding each class for multiple years upfront. Previously the contract funded the full fellowship of each class across multiple years. NDSEG class size will be reduced from 153 fellows in FY 2025 to 100 fellows in FY 2026, across the participating Services (Air Force, Army, and Navy).

A. Mission Description and Budget Item Justification

This program supports defense-related basic research in a wide range of scientific and engineering disciplines relevant to maintaining U.S. military technological superiority. Research topics include, but are not limited to, transformational and high-priority technologies such as nanotechnology, sensor networks, artificial intelligence and information fusion, smart materials and structures, quantum materials and processes for sensing, communication and computing, efficient energy and power conversion, and high-energy materials for propulsion and control. The program also enhances and promotes the education of U.S. scientists and engineers in disciplines critical to maintaining, advancing, and enabling future U.S. defense technologies. For example, the National Defense Science and Engineering Graduate (NDSEG) program awards fellowships to train U.S. citizens in science and engineering disciplines of military importance under a joint tri-Service and Office of the Under Secretary of Defense for Research and Engineering competitive scholarship program. Finally, this program assists universities in establishing superior instrumentation capabilities needed to improve the quality of defense-related research and education. A fundamental component of this program is the recognition that future technologies and technology exploitations require highly coordinated and concerted multi- and interdisciplinary efforts. Efforts in this program have been coordinated through the Department of Defense Science and Technology Executive Committee process to harmonize efforts and eliminate duplication.

This program is executed by the Air Force Research Laboratory (AFRL). AFRL is focused on high-impact, multi-domain science & technology (S&T) solutions that drive innovation now while laying the groundwork for the Air and Space Force to win the future fight. AFRL effectively synchronizes the Department of the Air Force (DAF) S&T enterprise and workforce to align towards the most consequential DAF priorities and accelerate the delivery of game-changing S&T.

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

Funds in this program element may be used to investigate specified science advancements in air, space and/or cyber domains.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force				Date: June 2025	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
3600: Research, Development, Test & Evaluation, Air Force I BA 1: Basic Research		PE 0601103F I University Research Initiatives			
B. Program Change Summary (\$ in Millions)	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Previous President's Budget	182.372	143.372	98.091	0.000	98.091
Current President's Budget	172.154	146.372	94.121	0.000	94.121
Total Adjustments	-10.218	3.000	-3.970	0.000	-3.970
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	17.500	3.000			
• Congressional Directed Transfers	-14.400	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-6.599	0.000			
• Other Adjustments	-6.719	0.000	-3.970	0.000	-3.970
Congressional Add Details (\$ in Millions, and Includes General Reductions)					
Project: 615094: <i>University Research Initiatives</i>					
Congressional Add: <i>Program increase: Intelligent 2D Sensors</i>					
Congressional Add: <i>Program increase: Behavioral Health Interventions</i>					
Congressional Add: <i>Program increase: Health and Science Multidomain Operations</i>					
Congressional Add: <i>Program increase: Gigahertz-Terahertz Research</i>					
Congressional Add Subtotals for Project: 615094					
Congressional Add Totals for all Projects					
Change Summary Explanation					
In FY 2024, decrease of \$14.400 million was due to a Congressional directed transfer to RDT&E, Space Force, PE 0601103SF, University Research Initiatives, for space unique S&T.					
In FY 2024, decrease of \$6.719 million in Other Adjustments was due to realignment of funds to PE 0602212F, Defense Laboratories R&D Projects, to implement the Department of Defense (DoD) Funding Laboratory Enhancements Across Four Categories (FLEX-4) authority under 10 U.S.C Section 4123.					
In FY 2026, the budget decreased by \$3.061 million due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency. The FY 2026 request was reduced by \$0.620 million for Advisory and Assistance Services to promote efficiencies and advance the policies of the Administration in alignment with Executive Order 14222, "Implementing the President's Department of Government Efficiency Cost Efficiency Initiative."					

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force				Date: June 2025		
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 1: Basic Research		R-1 Program Element (Number/Name) PE 0601103F I University Research Initiatives				
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Title: Multidisciplinary University Research Initiative Description: Promote fundamental, multi- and interdisciplinary science and engineering research projects involving multiple principal investigators. FY 2025 Plans: - Fund competitive research grants at U.S. universities that focus on significantly expanding the basic knowledge of Department of the Air Force-relevant science and technology areas. - Focus on complex research efforts not normally achievable in smaller funded, single investigator awards. - Support and recognize superior academic researchers in the early stages of their careers through the Presidential Early Career Award for Scientists and Engineers program. - Fund existing multi-year, multidisciplinary awards and receive proposals from universities to fund next round of multidisciplinary research grants. FY 2026 Base Plans: - Continue funding competitive research grants at U.S. universities that focus on significantly expanding the basic knowledge of Department of the Air Force-relevant science and technology areas. - Continue to focus on complex research efforts not normally achievable in smaller funded, single investigator awards. - Continue to support and recognize superior academic researchers in the early stages of their careers through the Presidential Early Career Award for Scientists and Engineers program. - Continue funding the existing multi-year, multidisciplinary awards and receive proposals from universities to fund next round of multidisciplinary research grants. FY 2026 OOC Plans: Not Applicable FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$12.444 million due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency. This will result in approximately eight fewer multidisciplinary university research grants awarded in this effort.		78.346	77.785	65.341	0.000	65.341
Title: Science and Engineering Education		57.251	51.362	14.575	0.000	14.575

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force				Date: June 2025		
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 1: Basic Research		R-1 Program Element (Number/Name) PE 0601103F I University Research Initiatives				
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Description: Support post-graduate, graduate, and undergraduate education in science and engineering disciplines at U.S. universities. FY 2025 Plans: - Award highly competitive National Defense Science and Engineering Graduate (NDSEG) fellowships. - Support competitive awards for graduate and undergraduate research experiences, including those established under the Awards to Stimulate and Support Undergraduate Research Experiences program. - Fund awards initiated under prior year DoD programs. FY 2026 Base Plans: - Continue to award highly competitive NDSEG fellowships. - Continue to support competitive awards for graduate and undergraduate research experiences, including those established under the Awards to Stimulate and Support Undergraduate Research Experiences program. - Continue funding for awards initiated under prior year DoD programs. FY 2026 OOC Plans: Not Applicable FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$36.787 million due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency. The NDSEG Fellowship Program contract will be restructured to fund current year academic costs only instead of funding each class for multiple years upfront. Previously the contract funded the full fellowship of each class across multiple years. NDSEG class size will be reduced from 153 fellows in FY 2025 to 100 fellows in FY 2026, across the participating Services (Air Force, Army, and Navy).						
Title: Research Instrumentation Description: Enable scientific and engineering research through advanced education infrastructure and instrumentation at U.S. universities. FY 2025 Plans:		19.508	14.225	14.205	0.000	14.205

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force			Date: June 2025			
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 1: Basic Research		R-1 Program Element (Number/Name) PE 0601103F I University Research Initiatives				
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- Award grants on a competitive basis under the Defense University Research Instrumentation Program to U.S. universities to acquire state-of-the-art, high technology instrumentation and infrastructure to enhance research and educational capabilities. FY 2026 Base Plans: - Continue awarding grants on a competitive basis under the Defense University Research Instrumentation Program to U.S. universities to acquire state-of-the-art, high technology instrumentation and infrastructure to enhance research and educational capabilities. FY 2026 OOC Plans: Not Applicable FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$0.020 million due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency.						
Accomplishments/Planned Programs Subtotals		155.105	143.372	94.121	0.000	94.121
		FY 2024	FY 2025			
Congressional Add: Program increase: Intelligent 2D Sensors FY 2024 Accomplishments: Conducted Congressionally-directed effort. FY 2025 Plans: Not Applicable		4.871	0.000			
Congressional Add: Program increase: Behavioral Health Interventions FY 2024 Accomplishments: Conducted Congressionally-directed effort. FY 2025 Plans: Not Applicable		7.307	0.000			
Congressional Add: Program increase: Health and Science Multidomain Operations FY 2024 Accomplishments: Conducted Congressionally-directed effort. FY 2025 Plans: Not Applicable		4.871	0.000			
Congressional Add: Program increase: Gigahertz-Terahertz Research		0.000	3.000			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 1: Basic Research		R-1 Program Element (Number/Name) PE 0601103F I University Research Initiatives	
		FY 2024	FY 2025
FY 2024 Accomplishments: Not Applicable			
FY 2025 Plans: Conduct Congressionally-directed effort.			
Congressional Adds Subtotals		17.049	3.000
D. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
E. Acquisition Strategy			
Not Applicable			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force **Date:** June 2025

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research</i>					R-1 Program Element (Number/Name) PE 0602020F <i>I Future AF Capabilities Applied Research</i>							
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
Total Program Element	0.000	77.903	70.277	78.214	0.000	78.214	-	-	-	-	-	-
620200: <i>Enterprise Transformational Appld Research</i>	0.000	77.903	70.277	78.214	0.000	78.214	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This program element develops multidisciplinary applied research efforts to accelerate the technology pipeline of transformational capabilities by reducing risk and maturing technologies so they can transition in support of larger advanced technology development capability investments. These activities are selected to enable solutions to the Department of the Air Force's (DAF's) highest priorities. The Explore effort creates investments to buy-down risk and accelerate enabling technologies to understand feasibility for future integration into 6.3 Future AF Integrated Technology Demo program. The Seedlings for Disruptive Capabilities Program (SDCP) facilitates Air Force Research Laboratory (AFRL) cross-disciplinary applied research to provide leap-ahead, high-risk high-payoff technology development. Modeling, simulation, and analysis activities will continue to explore transformational research into analytic technologies to validate capabilities and provide solid foundations for future efforts. These activities focus on predicting future outcomes and technology needs, as well as looking for more seedlings to feed the transformational capability pipeline. Efforts advance future workforce development projects and broaden partnerships to deepen and expand the scientific and technology enterprise. Applied research efforts span a broad spectrum of activities, and established processes allow agility and flexibility to meet higher demand signals while ensuring proper technical and financial execution metrics are met.

AFRL plans and manages these funds at the enterprise level to achieve high levels of collaboration executed across all the applicable Technology Directorates and applies the research toward disruptive capabilities. Building from the technology competencies and ecosystems of the Technology Directorates brings together the needed diverse expertise and components to develop the transformational capabilities.

In FY 2026, \$9.077 million is budgeted in this program for 27 direct Full-Time Equivalent (FTE) civilians. The Air Force Research Laboratory (AFRL) utilizes 10 USC 4091, "Authorities for certain positions at science and technology reinvention laboratories" to manage the workforce strength, structure, positions, and compensation. The use of program funds in this program element would be executed in the Technology Directorates in addition to the civilian pay expenses budgeted in program elements 0601102F, 0602102F, 0602202F, 0602203F, 0602204F, 0602602F, 0602605F, 0602788F, and 0602298F.

This program element may include necessary expenses to support the operation and maintenance of facilities to manage, execute, and deliver science and technology capabilities.

The FY 2026 request was reduced by \$0.163 million for Advisory and Assistance Services to promote efficiencies and advance the policies of the Administration in alignment with Executive Order 14222, "Implementing the President's Department of Government Efficiency Cost Efficiency Initiative."

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force				Date: June 2025		
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research		R-1 Program Element (Number/Name) PE 0602020F I Future AF Capabilities Applied Research				
The FY 2026 request was reduced by \$0.946 million for civilian personnel to optimize the workforce in compliance with Executive Order 14210, "Implementing the President's Department of Government Efficiency Workforce Optimization Initiative."						
This program is in Budget Activity 2, Applied Research because this budget activity includes studies, investigations, and non-system specific technology efforts directed toward general military needs with a view toward developing and evaluating the feasibility and practicality of proposed solutions and determining their parameters.						
B. Program Change Summary (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Previous President's Budget		90.713	85.477	90.742	0.000	90.742
Current President's Budget		77.903	70.277	78.214	0.000	78.214
Total Adjustments		-12.810	-15.200	-12.528	0.000	-12.528
• 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		-7.273	0.000			
• Reprogrammings		0.000	-15.200			
• SBIR/STTR Transfer		-2.200	0.000			
• Other Adjustments		-3.337	0.000	-12.528	0.000	-12.528
Change Summary Explanation						
FY 2024 Changes (-\$12.810 million):						
• Congressional: -\$7.3M was a Congressional directed transfer to Space PE 1206601SF for space-unique S&T.						
• SBIR/STTR Transfer: -\$2.200 million						
• Other Adjustments: -\$3.337 million for section-219						
FY 2025 Changes (-\$15.200 million):						
• Reprogramming: -\$15.200 million DAF reprogramming to support the Collaborative Combat Aircraft program						
FY 2026 Changes (-\$12.528 million):						
• Other Adjustments: \$4.385 million increase to updated average work-year cost in civilian pay. \$16.913 million decrease for programmatic adjustments to the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency.						
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2024	FY 2025	FY 2026
Title: Explore				38.619	36.376	39.088

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research</i>		R-1 Program Element (Number/Name) PE 0602020F <i>I Future AF Capabilities Applied Research</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
Description: Explore seeks to conduct early investments aligned against the highest DAF priority areas to assess feasibility and demonstrate proof of concepts to buy down risk and accelerate technology for integration with the Future AF Integrated technology Demo program. Explore's strategy-informed construct works to uncover areas within priorities requiring early investments to inform and accelerate game-changing and leap-ahead technologies to feed into the future Vanguard portfolio. Explore's three-step process identifies, invests in, and matures these technologies through 12 to 24-month feasibility studies and proof of concept activities. The technology areas are identified through concept decomposition horizon-scanning, or broad competitive calls to the nation's best and brightest innovators in Industry, Government, non-profits, and other non-traditional partners to identify novel solutions. These efforts provide opportunities for early assessment of operational viability to demonstrate feasibility of transformational warfighter capabilities for integration within the 6.3 Future AF Integrated Technology Demo program. To do this, a variety of approaches are used including modeling and simulation, military utility experimentation, exercise participation, technical analysis, technology/concept maturation, risk reduction activities, and subject matter expertise input. Explore informs future areas of research and aids in identifying emerging technologies which could enable larger advanced technology development capability investments. FY 2025 Plans: -Continue established investments in intelligence, surveillance, and reconnaissance in data support, software tools, and autonomy, and machine learning to counter adversary capabilities. - Continue established investments in energy solutions for power generation, energy storage, and energy transfer and transformative ways to provide power for resilient basing. - Continue established investments within future connected, survivable, and agile Autonomous Air-to-Air Refueling platforms to deliver fuel leveraging enterprise activities in autonomy and air vehicle design. - Continue investments in common support equipment that include new capabilities and technology to support flightline support equipment and generate new capabilities that will support agile combat employment operations. - Complete multiple energy solutions that explore loader technologies, rechargeable energy solutions, flexible power generation, wireless power distribution for agile combat employment, new engine technology, and transformative ways to provide power to an aircraft or forward operating location. - Complete investments in fog and edge computing to include computing solutions to process sensor data in real time, generate insights, and interact with the data in a distributed manner with the ability to send data to the cloud for additional processing. This further includes human computer interface technologies, energy efficient computing, architecture for data collection and processing, collaborative computing, data fusion, and networking. - Complete investments in electronic warfare to include autonomous modeling and simulation at the edge, resilient communications, and algorithm development. - Complete investments in high-speed affordable weapons.				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research</i>		R-1 Program Element (Number/Name) PE 0602020F <i>I Future AF Capabilities Applied Research</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Complete initial investments in counterintelligence, surveillance, and reconnaissance. - Initiate newly identified efforts which support immediate priorities of the Department of the Air Force (DAF) within areas of building combat effects capabilities, countering adversary capabilities, supporting contested logistics, and enabling effective command, control, and communications battle management (C3BM) that utilize increased assessments in feasibility and utility across a broad spectrum of solutions in identified topic areas. FY 2026 Plans: - Complete investments in intelligence, surveillance, and reconnaissance in data support, software tools, and autonomy, and machine learning to counter adversary capabilities. - Complete future connected, survivable, and agile Autonomous Air-to-Air Refueling platforms to deliver fuel leveraging enterprise activities in autonomy and air vehicle design. - Complete investments in common support equipment that include new capabilities and technology to support flightline support equipment and generate new capabilities that will support agile combat employment operations. - Continue energy investments in power generation, energy storage, energy transfer, and transformative ways to provide power for resilient basing. - Initiate newly identified efforts which support immediate priorities of the Department of the Air Force (DAF) Technology Executive Officer (TEO) including efforts for the Integrated Product Teams, increasing targeted risk reduction and technology acceleration within the transformational portfolio. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 funding increased compared to FY 2025 by \$2.712 million due to initiation of new Explore initiatives to assess feasibility and mission utility for targeted topic areas for Future AF Integrated Tech Demos including AI tools for data integration and assessment, intermediate force options, novel flight control techniques, and advanced structures.				
Title: Seedlings for Disruptive Capabilities (SDCP) Description: Integrates cross-enterprise multi-directorate transformational applied research efforts to accelerate the pipeline of technology-enabled capability candidates pursuing the Department of the Air Force priorities. Seedlings for Disruptive Capabilities solicit applied research to provide leap-ahead, high-risk high-payoff technology development. Significantly advances scientific progress of innovative concepts underpinning transformational operational capabilities to future forces, enhances organic AFRL research capabilities in an enterprise-level, cross-Directorate environment and fortifies external research partnerships to leverage key emerging technology developments in academia, industry, and government laboratories. The Air Force Research Laboratory plans and manages these research activities at the enterprise level with decentralized execution to achieve the intent of the strategy. FY 2025 Plans:		19.358	18.764	24.225

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research</i>		R-1 Program Element (Number/Name) PE 0602020F <i>I Future AF Capabilities Applied Research</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Complete research in infrastructure for trusted satellite autonomy for tactical rapid adversarial protection high assurance autonomy methodologies and human-autonomy interactions to react, plan, and decide on appropriate actions in space battle management. - Complete research in spectral/polarization-sensitive event-based cameras for intelligence, reconnaissance, and surveillance air moving target indicator with enhanced target identification and real-world predictive power. - Complete research in novel artificial intelligence-enabled methodologies to discover and characterize adversaries' defense systems to gain insight into organizational functionality. - Continue research in distributed coherent radars for UAV swarms developing magnitude improvements in detection range and target location accuracy. - Continue research in optimizing and affordably manufacturing long range weapons. - Initiate efforts which support immediate priorities of the Department of the Air Force by implementing cross-disciplinary applied research to provide leap-ahead, high-risk high-payoff technology development in areas such as RF communications for high altitude platforms. - Initiate programs in optical atomic clocks for advanced alternative Position, Navigation, and Timing (PNT), laser resilient optical mirrors for ground and space-based imagery systems, high-voltage gallium oxide radio-frequency static induction transistors for dramatic increase in radar power density, and passively augmented LIDAR for attritable sensing in contested environments. FY 2026 Plans: - Continue research in distributed coherent radars for Unmanned Aerial Vehicle (UAV) swarms developing magnitude improvements in detection range and target location accuracy. - Continue research in optimizing and affordably manufacturing long range weapons. - Continue efforts which support immediate priorities of the Department of the Air Force by implementing cross-disciplinary applied research to provide leap-ahead, high risk technology development in in wideband agile RF communications for high altitude modular platforms enabling a proliferated network of sensors to operate in contested environments - Continue programs in optical atomic clocks for advanced alternative PNT, laser resilient optical mirrors for ground and space-based imagery systems, high-voltage gallium oxide radio-frequency static induction transistors for dramatic increase in radar power density, and passively augmented LIDAR for attritable sensing in contested environments - Initiate a program to develop digitally programmable meta surfaces for persistent and resilient communications in contested environments. - Initiate efforts to enhance navigation in contested environments for networked collaborative autonomy and develop surveillance detection routing for inter/intra-salvo communication. - Initiate program for photonic and atomic navigation via optical metrology for asymmetrical advancement in Position, Navigation, and Timing (PNT) and synchronization to small platforms.				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research</i>		R-1 Program Element (Number/Name) PE 0602020F <i>I Future AF Capabilities Applied Research</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Initiate development of next-gen laser resilient mirrors with improved imaging resolution for space domain awareness and missile warning and launch detection. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY2025 by \$5.461 million due to initiation of enhancements in navigation (PNT) in contested environments; developing resilient programmable meta surfaces for communication in contested environments; and developing the next generation of laser resilient mirrors.				
Title: Data to Decisions and Collaborative Learning Description: Perform modeling, simulation, and analyses assessing the military utility of candidate transformational component applied research investments. Enhance the use of advanced systems for decision-making and a variety of innovations required to connect experts with operators in pursuit of achieving future force capabilities through applied research. Leverage best-in-class data analytics that connect warfighters with scientists and engineers, and innovating laboratory processes to accelerate technology maturation. Conduct a variety of strategic enterprise-level activities, including but not limited to regional campus hubs, scientists and engineers working with the leading national innovators; promoting technical proficiency in our military members, centers for excellence, and the Air Force Research Laboratory (AFRL) Front Door. AFRL collaborates with thousands of subject matter experts inside and outside government, academia, and industry enhancing and developing DoD relevant capabilities. Implements continuous lab process innovation via Air Force "TechConnect" tools connecting people with people and building a pipeline of ideas from external sources; leveraging AI-fueled tech connect platforms and supporting future force capabilities with real-time feedback loops through these tools, data analytics, and new connections to non-traditional partners. FY 2025 Plans: - Continue modeling, simulation, & analyses enabling validated positions and providing a solid foundation for predicting future outcomes. - Continue Air Force Research Laboratory's tech connect platforms connecting entrepreneurs, small business, industry, academia, & military with Air Force and Space Force science and technology ecosystem - Continue internships and undergraduate research opportunities to build the science and technology workforce pipeline. - Continue "Savage Future", connecting warfighters with the science and technology community, enabling understanding of both the problems and optimal solutions to accelerate results. - Continue the AFRL MidAtlantic and MidWest Regional Networks, building a collaborative network of small business, large business, academia, and ventures to risk reduce key dual purpose technology solutions addressing DAF priorities. FY 2026 Plans: - Continue modeling, simulation, & analyses enabling validated positions and providing a solid foundation for predicting future outcomes.		19.926	15.137	14.901

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research		R-1 Program Element (Number/Name) PE 0602020F I Future AF Capabilities Applied Research		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Continue Air Force Research Laboratory's tech connect platforms connecting entrepreneurs, small business, industry, academia, & military with Air Force and Space Force science and technology ecosystem - Continue internships and undergraduate research opportunities to build the science and technology workforce pipeline. - Continue "Savage Future", connecting warfighters with the science and technology community, enabling understanding of both the problems and optimal solutions to accelerate results. - Continue the AFRL MidAtlantic and MidWest Regional Networks, building a collaborative network of small business, large business, academia, and ventures to risk reduce key dual purpose technology solutions addressing DAF priorities. - Initiate multi-objective decision analyses enabling data-driven information for technological investments and maturation. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$0.236 million due to minor reprioritization of efforts within this PE.				
Accomplishments/Planned Programs Subtotals		77.903	70.277	78.214
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 2026 Air Force	Date: June 2025

Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
3600: Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research					PE 0602022F I University Affiliated Research Center (UARC) - Tactical Autonomy							
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
Total Program Element	0.000	6.180	8.225	6.294	0.000	6.294	-	-	-	-	-	-
622408: HBCU University Affiliated Research Center (UARC)	0.000	6.180	8.225	6.294	0.000	6.294	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

The Tactical Autonomy University Affiliated Research Center (UARC) supports a consortium performing innovative research to advance the state of the art as well as cultivate awareness of and expertise in the field of tactical autonomy. Research topics of interest include, but are not limited to, the following: Trust in Mission Autonomy, Collaboration between Platforms, and Human Machine Teaming.

Funds in this program element are planned to investigate, design, develop, digitize, and/or analyze specified technology advancements in air, space, ground, sea, and/or cyber domains. This research will address factors that have complicated the deployment and adoption of autonomous technologies such as trust in mission autonomy, collaboration between platforms, and human-machine teaming. Research will also seek to integrate autonomous technologies with advanced battle management systems.

This research initiative will support the Department of Defense Science, Technology, Engineering, and Mathematics (STEM) Strategic Plan and the Air and Space STEM Outreach Strategic Plan by establishing long-term core research expertise in tactical autonomy that will leverage scientific and engineering capabilities among the consortium of contributing universities. Tactical autonomy will be a critical technology in prolonged great power conflict because the development of autonomous systems is a realistic approach to counter an adversary approaching parity in conventional strength in theatre, and tactical autonomy will enable warfighting capability in an environment where command and control may be disrupted by cyber or electronic warfare effects. Research will produce creative solutions to optimize the capabilities of reliable data-driven autonomous platforms capable of operating in environments well suited to uncrewed systems, such as persistent defensive or force protection-related missions, or in high-risk environments such as heavy anti-access or Nuclear, Chemical, Biological (NBC) affected settings. One of the foremost advantages of the United States in technological competition is its advanced university-based scientific research institutions. This research initiative will strengthen the universities' scientific and engineering capabilities, advance the early career development of STEM students, leverage the research contributions of university faculty, and expand the pipeline of STEM graduates with national security experience for the government and the private-sector defense industrial base.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force				Date: June 2025		
Appropriation/Budget Activity		R-1 Program Element (Number/Name)				
3600: Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research		PE 0602022F I University Affiliated Research Center (UARC) - Tactical Autonomy				
B. Program Change Summary (\$ in Millions)	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	
Previous President's Budget	8.018	8.225	8.417	0.000	8.417	
Current President's Budget	6.180	8.225	6.294	0.000	6.294	
Total Adjustments	-1.838	0.000	-2.123	0.000	-2.123	
• 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	-1.548	0.000				
• SBIR/STTR Transfer	-0.290	0.000				
• Other Adjustments	0.000	0.000	-2.123	0.000	-2.123	
Change Summary Explanation						
In FY 2024, decrease of \$1.548 million was due to programmatic adjustments within the Science and Technology portfolio.						
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2024	FY 2025	FY 2026
Title: University Affiliated Research Center (UARC) For Tactical Autonomy				6.180	8.225	6.294
Description: Development of technologies and tools to enable autonomous systems to act with delegated and bounded authority of humans in support of tactical, short-term actions, associated with longer-term strategic visions. Examples of capability objectives are: Enhancing multi-domain situational awareness, faster data processing and analysis, enhancing force protection, supporting cyber defense, augmenting logistics operations, and automating maneuverability and mobility functions.						
FY 2025 Plans:						
Continuation of work by the UARC consortium to advance fieldable tactical autonomy for the Department of Defense by efforts including:						
-Development of a test, evaluation, verification and validation environment to calibrate sensor data and measure system performance						
-Software development and modeling to support trustworthy artificial intelligence capabilities						
-Research of multi-platform collaboration, human-machine teaming, self-adaptation issues, and multi-sensor fusion to operate in a swarming environment						

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research</i>	R-1 Program Element (Number/Name) PE 0602022F <i>I University Affiliated Research Center (UARC) - Tactical Autonomy</i>			
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
-Use of large language models to develop and test machine and deep learning algorithms for data analyses as part of an approach to incorporate explainable artificial intelligence into a multimodal data analytics system -Building increased autonomy research (AR) capacity to evaluate autonomous systems and sensor integration capabilities. Conduct applied research efforts to support development of the Loyal Wingman capability. Twenty-two research projects are currently planned for FY 2025. <i>FY 2026 Plans:</i> Continuation of the development of technologies and tools to enable autonomous systems to act with delegated and bounded authority of humans in support of tactical, short-term actions, associated with longer-term strategic needs to: -Develop and demonstrate trusted autonomous technologies operating with minimal supervision from human operators in complex and unpredictable environments. Plans are to apply research to the management of autonomous prototypes entering production and testing in the acquisition pathway. -Support the long-term strategic objective through the UARC consortium of expanding the air and space defense engineering pipeline to government and private industry. The program will raise the research capability levels of university consortium members. -Continue work by the UARC consortium members to build long-term research partnerships for tactical autonomy between university research members, the Department of Defense and the defense industry. <i>FY 2025 to FY 2026 Increase/Decrease Statement:</i> FY 2026 decreased compared to FY 2025 by \$1.931 million due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency.				
Accomplishments/Planned Programs Subtotals		6.180	8.225	6.294
D. Other Program Funding Summary (\$ in Millions) N/A				
Remarks The HBCU Tactical Autonomy UARC is co-funded by the Office of the Under Secretary of Defense (Research and Engineering) and other Department of Defense agencies for related tactical autonomy research tasks as needed.				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force</i> / BA 2: <i>Applied Research</i>	R-1 Program Element (Number/Name) PE 0602022F / <i>University Affiliated Research Center (UARC) - Tactical Autonomy</i>	
E. Acquisition Strategy Not applicable		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force	Date: June 2025

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research</i>	R-1 Program Element (Number/Name) PE 0602102F / <i>Materials</i>

COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
Total Program Element	0.000	274.790	185.336	147.422	0.000	147.422	-	-	-	-	-	-
624347: <i>Materials for Structures, Propulsion, and Subsystems</i>	0.000	130.112	84.816	59.700	0.000	59.700	-	-	-	-	-	-
624348: <i>Materials for Electronics, Optics, and Survivability</i>	0.000	92.730	52.561	41.402	0.000	41.402	-	-	-	-	-	-
624349: <i>Materials Technology for Sustainment</i>	0.000	51.948	47.959	46.320	0.000	46.320	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

The Air Force Research Laboratory (AFRL) is focused on high-impact, multi-domain science & technology (S&T) solutions that drive innovation now while laying the groundwork for the Air and Space Force to win the future fight. AFRL effectively synchronizes the Department of the Air Force (DAF) S&T enterprise and workforce to align towards the most consequential DAF priorities and accelerate the delivery of game-changing S&T.

This program develops advanced materials, processing, and inspection technologies to reduce life cycle costs and improve performance, sustainability, availability, affordability, supportability, reliability, and survivability of current and future Department of the Air Force systems and operations. The program has three projects that develop: structural, propulsion, and sub-systems materials and processes technologies; electronic, optical, and survivability materials and processes technologies; and sustainment materials, processes technologies, and advanced non-destructive inspection methodologies. Efforts in the program have been coordinated through the Department of Defense Science and Technology Executive Committee process to harmonize efforts and eliminate duplication.

Funds in this PE may be used to investigate specified technology advancements in air, space and/or cyber domains.

This program includes funding for the requisite DAF Science & Engineering (S&E) and mission enabling civilian workforce with the necessary technical competencies to develop, manage, and deliver science & technology capabilities. The use of program funds in this program element is in conjunction with the civilian pay expenses budgeted in the following program elements: 1206601SF, 1206616SF, 0601102F, 0602020, 0602202F, 0602203F, 0602204F, 0602298F, 0602336F, 0602602F, 0602605F, 0602788F, and 0603680F. In FY 2026, \$68.328 million is budgeted in this program for 333 direct Full-Time Equivalent (FTE) civilians. The Air Force Research Laboratory (AFRL) utilizes 10 USC 4091, "Authorities for certain positions at science and technology reinvention laboratories" to manage the workforce strength, structure, positions, and compensation.

This program element may include necessary expenses to support the operation and maintenance of facilities to manage, execute, and deliver science and technology capabilities.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force				Date: June 2025	
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research		R-1 Program Element (Number/Name) PE 0602102F I Materials			
This program is in Budget Activity 2, Applied Research because this budget activity includes studies, investigations, and non-system specific technology efforts directed toward general military needs with a view toward developing and evaluating the feasibility and practicality of proposed solutions and determining their parameters.					
B. Program Change Summary (\$ in Millions)	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Previous President's Budget	142.325	142.336	140.195	0.000	140.195
Current President's Budget	274.790	185.336	147.422	0.000	147.422
Total Adjustments	132.465	43.000	7.227	0.000	7.227
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	142.300	43.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-0.008	0.000			
• SBIR/STTR Transfer	-4.134	0.000			
• Other Adjustments	-5.693	0.000	7.227	0.000	7.227
Congressional Add Details (\$ in Millions, and Includes General Reductions)					
Project: 624347: Materials for Structures, Propulsion, and Subsystems					
Congressional Add: Program increase - accelerated material development for high mach capabilities			9.864	0.000	
Congressional Add: Program increase - scale titanium additive manufacturing for critical airframe structures			9.864	0.000	
Congressional Add: Program increase - advanced composites in hypersonics research			4.932	0.000	
Congressional Add: Program increase - continuous composite 3D printing for topologically optimized structures			2.959	0.000	
Congressional Add: Program increase - continuous fiber 3D printing for hypersonic applications			9.864	0.000	
Congressional Add: Program increase - high energy synchrotron x-ray research			8.878	9.000	
Congressional Add: Program increase - minority leaders research collaboration program			8.878	0.000	
Congressional Add: Program increase - scanning and additive manufacturing			1.479	1.000	
Congressional Add: Program increase - thermal protection for hypersonic vehicles			6.905	5.500	
Congressional Add: Program increase - brain health biomarker and sensor technology			4.932	0.000	
Congressional Add: Porgram increase - classified additive manufactuirng			8.458	0.000	
Congressional Add: Program increase - analytical simulation of composites for hypersonics			0.000	2.500	
Congressional Add: Program increase - additive manufacturing of alloys			0.000	2.000	

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research</i>		R-1 Program Element (Number/Name) PE 0602102F <i>I Materials</i>	
<u>Congressional Add Details (\$ in Millions, and Includes General Reductions)</u>		FY 2024	FY 2025
Congressional Add: <i>Program Increase - disruptive alloy metals development</i>		0.000	10.000
Congressional Add Subtotals for Project: 624347		77.013	30.000
Project: 624348: <i>Materials for Electronics, Optics, and Survivability</i>			
Congressional Add: <i>Program increase - far forward human performance, sustainment, and resilience</i>		9.864	0.000
Congressional Add: <i>Program increase - synthetic biology manufacturing of critical materials</i>		9.667	0.000
Congressional Add: <i>Program increase - nano-bio technologies</i>		7.398	0.000
Congressional Add: <i>Program increase - biomaterials for ground infrastructure reinforcement</i>		4.932	0.000
Congressional Add: <i>Program increase - composites for electromagnetic interference shielding</i>		3.945	0.000
Congressional Add: <i>Program increase - manufactured radio frequency photonic devices and systems for airborne platforms</i>		3.945	0.000
Congressional Add: <i>Program increase - infrared meta-material coatings</i>		2.466	0.000
Congressional Add: <i>Program increase - classified additive manufacturing</i>		11.000	0.000
Congressional Add: <i>Program increase - next generation small satellite</i>		0.000	10.000
Congressional Add: <i>Program increase - non-electric radio frequency devices and systems for distributed operations</i>		0.000	3.000
Congressional Add Subtotals for Project: 624348		53.217	13.000
Project: 624349: <i>Materials Technology for Sustainment</i>			
Congressional Add: <i>Program increase - multi-functional protective materials</i>		9.864	0.000
Congressional Add Subtotals for Project: 624349		9.864	0.000
Congressional Add Totals for all Projects		140.094	43.000
<u>Change Summary Explanation</u>			
The FY 2026 request was reduced by \$0.310 million for Advisory and Assistance Services to promote efficiencies and advance the policies of the Administration in alignment with Executive Order 14222, "Implementing the President's Department of Government Efficiency Cost Efficiency Initiative."			
The FY 2026 request was reduced by \$7.116 million for civilian personnel to optimize the workforce in compliance with Executive Order 14210, "Implementing the President's Department of Government Efficiency Workforce Optimization Initiative."			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	
3600: Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research	PE 0602102F I Materials	
The remainder of the overall FY 2026 increase of \$7.227 million is due to updated average work year cost for civilian pay and negative programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency In FY 2024, the decrease of \$5.693 million in Other Adjustments was due to realignment of funds to PE 0602212F, Defense Laboratories R&D Projects, to implement the Department of Defense (DoD) Funding Laboratory Enhancements Across Four Categories (FLEX-4) authority under 10 U.S.C. Section 4123.		

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602102F / Materials				Project (Number/Name) 624347 / Materials for Structures, Propulsion, and Subsystems			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
624347: Materials for Structures, Propulsion, and Subsystems	0.000	130.112	84.816	59.700	0.000	59.700	-	-	-	-	-	-
Note Increases in FY26 include adjustments for a civilian pay reprice.												
A. Mission Description and Budget Item Justification This project develops and transitions materials and processing technologies to enhance the affordability, maintainability, and performance of current and future Air Force weapon systems. A key focus is affordable, lightweight materials for aircraft, spacecraft, missiles, and propulsion systems. These materials include metals, polymers, ceramics, metallic and nonmetallic composites, and hybrid materials, designed to improve the structural and performance of existing systems and to address future system needs. Key features of the materials and structures being developed are that they have improved ablation and oxidation resistance, structural integrity, thermal management capabilities, and strength to weight ratios. These attributes enable expanded mission capability for missile and aircraft systems. New processes are developed to provide more affordable solutions while maintaining the performance of fielded and future operational systems. To maintain the performance of fielded systems, the project develops alternative or replacement materials that address obsolescence challenges. The project develops advanced processing methods to enable adaptive manufacturing of aerospace materials.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2024	FY 2025	FY 2026	
Title: Ceramics and Composites									26.556	27.002	29.560	
Description: Develop and transition carbon/carbon, carbon/silicon carbide, other ceramics, polymer, polymer and ceramic matrix composites, and hybrid materials technologies for performance and supportability improvement in propulsion systems and high temperature aerospace structures.												
FY 2025 Plans: - Continue validating, demonstrating, and maturing new advanced processing methods, coating technologies, and behavioral life prediction concepts for current and future higher capability polymer, preceramic polymers and ceramic matrix composites. - Continue in-depth analyses and assessment of severe environment durability of advanced composite systems via mechanical testing. - Continue validating, developing, and testing the new ceramic and polymer matrix composite materials and processes with higher temperature capability for next generation propulsion systems and aerospace structures. - Continue advancing and integrating the computational material science infrastructure for composite materials in tools to model, characterize, and accelerate the development and certification of advanced composite materials.												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602102F / <i>Materials</i>	Project (Number/Name) 624347 / <i>Materials for Structures, Propulsion, and Subsystems</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Continue verifying and validating damage progression models on increasingly complex polymer matrix composite structural applications. - Continue developing and validating newer testing and assessment methods on composite damage progression models for application in an engineering environment. - Continue developing and validating advanced materials to meet evolving requirements for structural hardening. - Continue development and refinement modeling tools to link processing to performance of organic/polymer matrix composites and expand damage mechanics models to increasingly complex composite materials. FY 2026 Plans: - Continue validating, demonstrating, and maturing advanced processing methods, including novel preceramic polymer and fiber infiltration techniques, for the fabrication of ultra-high temperature ceramic matrix composites (UHTCMCs). This effort also encompasses the development of robust life prediction models for current and future CMCs to ensure mission success in operational environments. Continue developing affordable polymer matrix composites (PMCs) leveraging additive manufacturing for rapid production of components targeted for future collaborative combat aircraft (CCA) applications. - Continue in-depth analyses and assessments of the durability of UHTCMCs and affordable PMCs in extreme environments to understand performance versus cost trade-offs. - Continue validating, developing, and testing the new ceramic and polymer matrix composite materials in relevant service environments for propulsion and aerospace structures. - Continue advancing and integrating a computational materials science modeling and analysis tool suite to accelerate the development, characterization, and ultimate certification of new advanced composite materials. - Continue verifying and validating damage progression models on increasingly geometrically complex, integrated polymer matrix composite structures to support transition of required materials in weapon systems. - Complete developing and validating newer testing and assessment methods on composite damage progression models for application in an engineering environment. - Continue developing and validating advanced specialty and multifunctional materials for platform protection and weight reduction, to meet evolving mission requirements. - Accelerate development and refinement modeling and computation tools to link processing to performance of organic/polymer matrix composites and expand damage mechanics models to increasingly complex composite materials to certify for use in current and future systems. FY 2025 to FY 2026 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602102F / Materials	Project (Number/Name) 624347 / Materials for Structures, Propulsion, and Subsystems		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
FY 2026 funding increased compared to FY 2025 by \$2.558 million due to updated average work year cost pricing for direct civilian FTEs and added emphasis on developing computational models to accelerate qualification and certification of composite materials for high temperature applications.				
Title: Metals Description: Develop lightweight and high temperature metallics, life prediction technologies, and metals processing technologies for increased affordability, durability, and reliability of Department of the Air Force systems. FY 2025 Plans: - Continue validating, demonstrating, and implementing advanced computation methods to support faster material development and characterization modeling. - Continue analyzing relationships between microstructure, processing, properties, and performance of affordable metallic and high performance gradient metallic materials. - Continue validating integrated material/manufacturing and component analysis for life management and development of affordable structural metals and low-cost processes. - Continue validating the value of integrated analytical tools in the optimization of design and certification of additively manufactured metallic components. - Continue developing fast-acting, material agnostic R&D simulation capabilities for addressing hypersonic structure and next generation propulsion capabilities via metallic additive manufacturing to provide an alternative production process where applicable, and to reduce reliance on traditional supply chains. - Continue developing and refining processing methods and affordable metals for low cost, attritable propulsion systems. - Continue research on application of advanced data science, artificial intelligence and machine learning on materials science problems. FY 2026 Plans: - Continue validating, demonstrating, and implementing advanced computational methods to accelerate the invention, development, and characterization (including physical properties modeling) of next-generation alloy systems for future weapon systems. - Continue analyzing relationships between microstructure, processing, properties, and performance of affordable metallic and high-performance metallic materials, focused on current generation high temperature alloys and state of the art extreme temperature alternatives for expanded capability. - Continue developing and validating integrated material/manufacturing and component analysis for life management and development of affordable structural metals and materials in extreme environments, focuses on pushing existing alloys to increasingly higher temperatures and extreme conditions.		18.319	18.313	20.048

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602102F / Materials	Project (Number/Name) 624347 / Materials for Structures, Propulsion, and Subsystems		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Continue validating the value of integrated analytical tools to optimize the design and certification of additively manufactured metallic components, thereby reducing system cost and testing requirements. - Continue developing fast-acting, material agnostic R&D simulation capabilities for addressing hypersonic structure and next generation propulsion capabilities via metallic additive manufacturing to provide an alternative production process where applicable, and to reduce reliance on traditional supply chains. - Continue developing and refining processing methods for affordable metals for low cost, attritable propulsion systems to support large volume throughput. - Continue research on application of advanced data science, artificial intelligence, and machine learning to more efficiently address materials science problems, initially focused on accelerating characterization of materials and enabling higher fidelity microstructure and performance modeling. - Initiate developing and transitioning materials and processes for high temperature applications in extreme environments for future weapon systems. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 funding increased by \$1.735 million from FY 2025 due to updated average work year cost pricing for direct civilian FTEs and to intensified efforts to demonstrate an alloy operating at increased temperatures.				
Title: Thermal Protection Materials Description: Develop and evaluate lightweight, active, adaptive, multifunctional, high temperature, and durable material systems for extreme environments and hypersonic applications. FY 2025 Plans: - Continue validating and maturing processing methods for fabricating materials required for expendable hypersonic applications. - Continue validating, developing, and refining unique experimental techniques to assess mechanical properties and time dependent behavior. - Continue validating and demonstrating material properties and performance to meet design needs for control surfaces, leading edges, aeroshells, and apertures. - Continue development of computational models to assess environmental degradation of materials in a hypersonic environment. FY 2026 Plans: - Complete validating and maturing processing methods for fabricating materials such as C/SiC and ultra-high temperature ceramic matrix composites required for expendable hypersonics. - Continue validating, developing, and refining unique experimental techniques to assess behavior in extreme environments such as thermal shock for use in future expendable and reusable hypersonic systems.		5.112	5.401	5.912

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602102F / Materials	Project (Number/Name) 624347 / Materials for Structures, Propulsion, and Subsystems		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Continue validating and demonstrating material properties using high temperature testing methods (e.g., torch testing, laser-heating, arc jet, etc.) and predict performance to meet future mission requirements for control surfaces, leading edges, aeroshells, and apertures in hypersonic environments. - Continue development of computational models to assess environmental degradation of materials in a hypersonic environment. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 funding increased by \$0.511 million from FY 2025 due to updated average work year cost pricing for direct civilian FTEs.				
Title: Pervasive and Affordable Metals Technologies Description: Develop, demonstrate and transition affordable metals invention, processing and prediction technology to enable cost effective future defense capabilities including novel high temperature powder processing materials/structures and additive metals technology concepts to enable future defense capabilities, air vehicle propulsion, and computational prediction models. FY 2025 Plans: - Continue demonstration of affordable metallic turbine engine disks made via powder processing technologies through high temperature, aggressive environment testing. - Continue development of low cost, complex shape metallic components made through additive manufacturing for advanced weapon system component prototypes. - Continue development of computational methodologies that incorporate the impact of surface residual stress on the ability to extend life and lower life cycle cost of air vehicle propulsion system components. FY 2026 Plans: - Complete demonstration of affordable metallic turbine engine disks made via powder processing technologies through high temperature, aggressive environment testing to enable acceptance/certification of engine components. - Continue development of low cost, complex shape metallic components made through additive manufacturing supporting qualification, certification, and sustainment for use in advanced weapon system component prototypes and legacy aircraft. - Continue development of computational methodologies that incorporate the impact of surface residual stress on the ability to extend life and lower life cycle cost of air vehicle propulsion system components. - Initiate development of advanced titanium, nickel and refractory alloys and processes targeted for platforms operating in extreme environments and requiring capability beyond legacy alloys. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 funding increased by \$0.080 million from FY 2025 due to updated average work year cost pricing for direct civilian FTEs.		3.112	4.100	4.180
Accomplishments/Planned Programs Subtotals		53.099	54.816	59.700

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602102F / <i>Materials</i>	Project (Number/Name) 624347 / <i>Materials for Structures, Propulsion, and Subsystems</i>
	FY 2024	FY 2025
Congressional Add: Program increase - accelerated material development for high mach capabilities	9.864	0.000
FY 2024 Accomplishments: Conducted Congressionally directed efforts.		
FY 2025 Plans: Not applicable		
Congressional Add: Program increase - scale titanium additive manufacturing for critical airframe structures	9.864	0.000
FY 2024 Accomplishments: Conducted Congressionally directed efforts.		
FY 2025 Plans: Not applicable		
Congressional Add: Program increase - advanced composites in hypersonics research	4.932	0.000
FY 2024 Accomplishments: Conducted Congressionally directed efforts.		
FY 2025 Plans: Not applicable		
Congressional Add: Program increase - continuous composite 3D printing for topologically optimized structures	2.959	0.000
FY 2024 Accomplishments: Conducted Congressionally directed efforts.		
FY 2025 Plans: Not applicable		
Congressional Add: Program increase - continuous fiber 3D printing for hypersonic applications	9.864	0.000
FY 2024 Accomplishments: Conducted Congressionally directed efforts.		
FY 2025 Plans: Not applicable		
Congressional Add: Program increase - high energy synchrotron x-ray research	8.878	9.000
FY 2024 Accomplishments: Conducted Congressionally directed efforts.		
FY 2025 Plans: Conduct Congressionally directed efforts.		
Congressional Add: Program increase - minority leaders research collaboration program	8.878	0.000
FY 2024 Accomplishments: Conducted Congressionally directed efforts.		
FY 2025 Plans: Not applicable		
Congressional Add: Program increase - scanning and additive manufacturing	1.479	1.000

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602102F / <i>Materials</i>	Project (Number/Name) 624347 / <i>Materials for Structures, Propulsion, and Subsystems</i>
	FY 2024	FY 2025
FY 2024 Accomplishments: Conducted Congressionally directed efforts.		
FY 2025 Plans: Conduct Congressionally directed efforts.		
Congressional Add: Program increase - thermal protection for hypersonic vehicles	6.905	5.500
FY 2024 Accomplishments: Conducted Congressionally directed efforts.		
FY 2025 Plans: Conduct Congressionally directed efforts.		
Congressional Add: Program increase - brain health biomarker and sensor technology	4.932	0.000
FY 2024 Accomplishments: Conducted Congressionally directed efforts.		
FY 2025 Plans: Not applicable		
Congressional Add: Porgram increase - classified additive manufactuirng	8.458	0.000
FY 2024 Accomplishments: Conduct Congressionally directed efforts. Work split between this project and Project 624348, Materials for Electronics, Optics, and Survivability.		
FY 2025 Plans: Not Applicable		
Congressional Add: Program increase - analytical simulation of composites for hypersonics	0.000	2.500
FY 2024 Accomplishments: Not applicable		
FY 2025 Plans: Conduct Congressionally directed efforts.		
Congressional Add: Program increase - additive manufacturing of alloys	0.000	2.000
FY 2024 Accomplishments: Not applicable		
FY 2025 Plans: Conduct Congressionally directed efforts.		
Congressional Add: Program Increase - disruptive alloy metals development	0.000	10.000
FY 2024 Accomplishments: Not applicable		
FY 2025 Plans: Conduct Congressionally directed efforts.		
Congressional Adds Subtotals	77.013	30.000
C. Other Program Funding Summary (\$ in Millions)		
N/A		

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602102F / <i>Materials</i>	Project (Number/Name) 624347 / <i>Materials for Structures, Propulsion, and Subsystems</i>
C. Other Program Funding Summary (\$ in Millions)		
<u>Remarks</u>		
D. Acquisition Strategy		
N/A.		

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602102F / Materials				Project (Number/Name) 624348 / Materials for Electronics, Optics, and Survivability			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
624348: Materials for Electronics, Optics, and Survivability	0.000	92.730	52.561	41.402	0.000	41.402	-	-	-	-	-	-
Note Within Project 624348, Materials for Electronics, Optics, and Survivability, the following changes occurred: In FY 2026, the Infrared Detector and Electromagnetic Device Materials effort was renamed the Electronic Materials effort to encompass research outside the infrared spectrum and incorporate more diverse material types. In FY 2026, the Directed Energy Hardened Materials effort was renamed the Materials for Electromagnetic Protection effort to better reflect the scope of the research. In FY 2026, the Nanostructured and Biological Materials effort was renamed the Biological Materials effort to sharpen the research focus on biomanufacturing and biotechnology. A. Mission Description and Budget Item Justification This project develops materials technologies for the Department of the Air Force's Intelligence, Surveillance, and Reconnaissance (ISR), situational awareness, and specialty coatings for aerospace platforms and munitions. This includes sensors for microwave, short, mid, and long-wave infrared (SWIR, MWIR, LWIR) detection and countermeasures devices used for targeting, electronic warfare, and active aircraft protection. Electronic and optical materials are being developed to enable surveillance and situational awareness with faster operating speeds, greater tunability, higher power output, improved thermal management (including higher operating temperatures), greater sensitivity, and extended dynamic range. This project develops materials for protection of aircrews, sensors, and aerospace structures from directed energy threats without impairing mission effectiveness. Nanostructured and biological materials are being developed for aerospace structures, munitions, aerospace vehicle subsystems, and personnel. B. Accomplishments/Planned Programs (\$ in Millions)												
Title: Electronic Materials Description: In FY 2026, this effort was renamed from "Infrared Detector and Electromagnetic Device Materials" to "Electronic Materials" to encompass research outside the infrared spectrum and incorporate more diverse material types. This effort develops and transitions electronic materials and processes for performance, affordability, and operational capability of surveillance, tracking, targeting, and situational awareness systems for the Department of the Air Force. FY 2025 Plans:									FY 2024	FY 2025	FY 2026	
									12.249	12.264	12.835	

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602102F / <i>Materials</i>		Project (Number/Name) 624348 / <i>Materials for Electronics, Optics, and Survivability</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
- Continue specific development and demonstration of short wave infrared detector and hyper-spectral long wave infrared materials. - Continue development and prototype demonstration of multi-spectral integrated chip-scale lasers supporting new classes of active sensing, infra-red countermeasure, and optical communication applications. - Continue advanced development, demonstration and validation of materials and processes for control and detection of electromagnetic radiation for Intelligence, Surveillance and Reconnaissance (ISR) technologies. - Continue the development, testing, and assessment of materials for use in high resolution imaging by electromagnetic radiation. - Continue advanced demonstration of nanoscale materials, metamaterials, and models for use in producing detectors. - Continue utilizing all aspects of computational materials science to improve performance prediction and reliability models, as well as analyzing quantum materials for aerospace applications. - Continue verifying and validating materials and processes for integration of radio frequency and optical signals as well as concepts for novel optical devices and components. - Continue development of photonics for aerospace applications, and demonstrate nanostructured materials for components to enable agile radio frequency capability. - Continue development of techniques using quantum materials and processes. - Continue development of software defined imaging receivers. FY 2026 Plans: - Complete specific development and demonstration of short wave infrared detector and hyper-spectral long wave infrared materials. - Complete development and prototype demonstration of multi-spectral integrated chip-scale lasers supporting new classes of active sensing, infra-red countermeasure, and optical communication applications. - Complete advanced development, demonstration and validation of carbon nanomaterials, such as carbon nanotubes and processes for control and detection of electromagnetic radiation for Intelligence, Surveillance and Reconnaissance (ISR) technologies. - Continue the development, testing, and assessment of low-dimensional carbon nanomaterials, such as carbon nanotubes and superlattice structures for use in high resolution imaging by electromagnetic radiation. - Continue advanced demonstration of multifunctional metamaterials based on low-dimensional semiconducting materials combined with superlattice configurations from models for use in military imaging systems. - Continue utilizing all aspects of computational materials science to improve performance prediction and reliability models, as well as analyzing quantum materials, such as topological insulators, superconductors, multiferroics, and quantum dots for aerospace applications. - Continue verifying and validating thin film Lithium Niobate and Barium Titanate and associated processes for integration of radio frequency and optical signals as well as concepts for novel optical devices and components.					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602102F / Materials	Project (Number/Name) 624348 / Materials for Electronics, Optics, and Survivability		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Continue development of photonics for aerospace applications and demonstrate nanostructured materials for components to enable agile radio frequency capability. - Continue development of techniques using quantum materials, including topological insulators, superconductors, multiferroics, quantum emitters, and processes for magnetic navigation. - Continue development of software defined imaging receivers to include radio frequency photonic receiver materials for SIGINT, electronic warfare, and self-protect missions. - Initiate development of thin film ferromagnetics and multiferroic heterostructures for element-level frequency filtering in RF and communication systems. - Initiate investigating high temperature electronic materials for improved flight control and testing of hypersonic platforms. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 funding increased by \$0.571 million from FY 2025 due to updated average work year cost pricing for direct civilian FTEs.				
Title: Materials for Electromagnetic Protection Description: In FY 2026, this effort was renamed from "Directed Energy Hardened Materials" to "Materials for Electromagnetic Protection" to better reflect the scope of the research. This effort develops and demonstrates technologies to enhance the safety, survivability, and mission effectiveness of personnel, sensors, viewing systems, and related Department of the Air Force assets FY 2025 Plans: - Continue analyzing, validating, and demonstrating the comprehensive generated data of materials and technologies to protect against directed energy threats. - Continue developing and demonstrating the response of advanced optical materials, including hybrid materials, for protection against high-energy lasers. - Continue developing novel approaches for integration of multimodal hardening into structures and devices. - Continue assessing data, validating repeatability, and utilizing computational materials science to enhance multi-scale modeling for design of robust, reliable integrated protection. - Complete development of proven selected advanced materials technologies to protect against nuclear flash blindness. FY 2026 Plans: - Continue analyzing, validating, and demonstrating the viability of inorganic/organic optical coatings, liquid crystal photonics, solid state photonics, and inorganic/organic optical metasurfaces technologies to protect against extreme electromagnetic environments.		11.855	11.868	12.421

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602102F / Materials	Project (Number/Name) 624348 / Materials for Electronics, Optics, and Survivability		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Continue developing and demonstrating the response of advanced optical materials, including hybrid materials, for protection against high-energy lasers. - Continue leveraging machine learning approaches and modeling and simulation for integration of multidomain protection into structures and devices. - Continue assessing data, validating repeatability, and utilizing computational materials science to enhance multi-scale modeling for design of robust, reliable, integrated protection. - Initiate development of wavelength agile technologies in novel form factors to protect against nuclear flash blindness. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 funding increased by \$0.553 million from FY 2025 due to updated average work year cost pricing for direct civilian FTEs.				
Title: Laser Source Materials Description: Develop materials to enable higher performance high power laser sources (quasi-Continuous Wave to Continuous Wave) with emphasis on laser output in the mid-infrared spectral region (2-5 microns). FY 2025 Plans: - Continue demonstrating and validating materials and process technologies to control and generate directed electromagnetic energy for survivability and other applications. - Continue to demonstrate and model materials processes for controlling laser beam direction and focus with optical components and materials for frequency conversion, high power optical isolators, and mid-wave infrared laser sources for directed energy sources. FY 2026 Plans: - Continue demonstrating and validating semiconductor materials and processing control technologies to generate higher power directed energy lasers for aircraft survivability and other applications. - Continue to demonstrate and model materials processes for controlling laser beam direction and focus with optical components and materials for frequency conversion, high power optical isolators, and mid-wave infrared laser sources for directed energy sources. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 funding increased by \$0.074 million from FY 2025 due to updated average work year cost pricing for direct civilian FTEs		1.580	1.582	1.656
Title: Biological Materials Description: In FY 2026, this effort was renamed from "Nanostructured and Biological Materials" to "Biological Materials" to sharpen the research focus on biomanufacturing and biotechnology.		13.829	13.847	14.490

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602102F / <i>Materials</i>	Project (Number/Name) 624348 / <i>Materials for Electronics, Optics, and Survivability</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
This effort develops enabling and foundational biotechnologies for critical materials, advanced fuels, propellants and energetics, advanced coatings, and resilient basing, for the Department of the Air Force applications.				
FY 2025 Plans: - Complete exploring biotechnology to assess the impact of microbes and fungi on Department of the Air Force systems. - Complete studying more robust and reliable materials and processes to optimize components for compact, flexible, stretchable multi-functional devices, and validate materials and processes for functional additive manufacturing of electronic components. - Continue validating and verifying engineering, scientific, and processing methods for nano and biological materials to address unique requirements for the Department of the Air Force human-machine integration and electronic components. - Continue demonstrating methods to assess reliability and field resiliency of nano and biological materials and processes. - Continue supporting the Flexible Hybrid Electronics Institutes for Manufacturing Innovation and the NanoBio Manufacturing Consortium for collaborative teaming. - Continue development of agile materials for basing, infrastructure and expeditionary operations.				
FY 2026 Plans: - Continue validating and verifying scientific, engineering, and processing methods for domestic bio-production of critical materials including characterization, qualification, demonstration, production scale up, and biomanufacturing to address unique requirements for the Department of the Air Force. - Continue demonstrating methods to assess reliability and field resiliency of biological materials including natural and synthetic rubber, protective coatings, and adhesives against current Department of the Air Force technical and operational gaps. - Continue collaboration with the NanoBio Manufacturing Consortium (NBMC) and NextFlex (formerly known as Flexible Hybrid Electronics Manufacturing Innovation Institute), focusing on joint projects to accelerate development of domestic biomanufacturing technologies for critical Department of the Air Force needs. - Continue development and scale-up of biocementation materials for agile basing, infrastructure and expeditionary operations, including runway stabilization. - Initiate development of experimental methods to optimize biomanufacturing of critical material precursors essential for Department of Air Force applications. - Initiate development of bio-derived molecules for advanced fuels, propellants and energetics for Department of the Air Force high-speed critical aerospace systems.				
FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 funding increased by \$0.643 million from FY 2025 due to updated average work year cost pricing for direct civilian FTEs				
Accomplishments/Planned Programs Subtotals		39.513	39.561	41.402

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602102F / <i>Materials</i>	Project (Number/Name) 624348 / <i>Materials for Electronics, Optics, and Survivability</i>
	FY 2024	FY 2025
Congressional Add: Program increase - far forward human performance, sustainment, and resilience	9.864	0.000
FY 2024 Accomplishments: Conducted Congressionally directed efforts.		
FY 2025 Plans: Not applicable		
Congressional Add: Program increase - synthetic biology manufacturing of critical materials	9.667	0.000
FY 2024 Accomplishments: Conducted Congressionally directed efforts.		
FY 2025 Plans: Not applicable		
Congressional Add: Program increase - nano-bio technologies	7.398	0.000
FY 2024 Accomplishments: Conducted Congressionally directed efforts.		
FY 2025 Plans: Not applicable		
Congressional Add: Program increase - biomaterials for ground infrastructure reinforcement	4.932	0.000
FY 2024 Accomplishments: Conducted Congressionally directed efforts.		
FY 2025 Plans: Not applicable		
Congressional Add: Program increase - composites for electromagnetic interference shielding	3.945	0.000
FY 2024 Accomplishments: Conducted Congressionally directed efforts.		
FY 2025 Plans: Not applicable		
Congressional Add: Program increase - manufactured radio frequency photonic devices and systems for airborne platforms	3.945	0.000
FY 2024 Accomplishments: Conducted Congressionally directed efforts.		
FY 2025 Plans: Not applicable		
Congressional Add: Program increase - infrared meta-material coatings	2.466	0.000
FY 2024 Accomplishments: Conducted Congressionally directed efforts.		
FY 2025 Plans: Not applicable		
Congressional Add: Program increase - classified additive manufacturing	11.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602102F / <i>Materials</i>	Project (Number/Name) 624348 / <i>Materials for Electronics, Optics, and Survivability</i>

	FY 2024	FY 2025
FY 2024 Accomplishments: Conduct Congressionally directed efforts. Work split between this project and Project 624347, Materials for Structures, Propulsion, and Subsystems. FY 2025 Plans: Not applicable.		
Congressional Add: Program increase - next generation small satellite FY 2024 Accomplishments: Not applicable FY 2025 Plans: Conduct Congressionally directed efforts.	0.000	10.000
Congressional Add: Program increase - non-electric radio frequency devices and systems for distributed operations FY 2024 Accomplishments: Not applicable. FY 2025 Plans: Conduct Congressionally directed efforts.	0.000	3.000
Congressional Adds Subtotals	53.217	13.000

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

Remarks

D. Acquisition Strategy
 N/A.

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602102F / Materials				Project (Number/Name) 624349 / Materials Technology for Sustainment			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
624349: Materials Technology for Sustainment	0.000	51.948	47.959	46.320	0.000	46.320	-	-	-	-	-	-
Note Within Project 624349, Materials Technology for Sustainment, the following changes occurred: In FY 2026, the Production and Repair Technologies effort was renamed the Materials/Processes for Affordable Survivability effort to highlight its emphasis on durable and survivable materials. In FY 2026, the Failure Analysis Technologies effort was renamed the Failure Analysis and Mishap Prevention Technologies effort to encompass both preemptive mishap prevention and post-failure analysis of materials, components, and systems.												
A. Mission Description and Budget Item Justification This project develops materials and processing technologies to support operational Department of the Air Force mission areas by providing the ability to inspect the quality of delivered systems, transition more reliable and maintainable materials, establish a capability to detect and characterize performance threatening defects, characterize materials processes and properties necessary for materials transition, and provide quick reaction support and failure analysis to the operational commands and repair centers. Repair techniques and nondestructive inspection/evaluation (NDI/E) methods are developed that are needed for metallic and non-metallic structures, coatings, corrosion control processes, and to support integration of composite structures for aerospace systems. Various NDI/E methods are essential to ensure optimum quality in the design and production of aircraft, propulsion, and missile systems. These NDI/E methods are also essential to monitor and detect the onset of any service-initiated damage and/or deterioration due to aging of operational systems.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2024	FY 2025	FY 2026	
Title: Material State Awareness									14.729	16.786	16.212	
Description: Develop Materials State Awareness technologies to identify and characterize materials and/or damage at all size scales, improving the readiness and availability of fielded structures, propulsion systems, and specialty materials, and enabling accelerated qualification of advanced materials for Department of the Air Force systems.												
FY 2025 Plans: - Continue validating and demonstrating non-destructive evaluation modeling capabilities and use these competencies to drive improvements in capability to detect, characterize and quantify damage in realistic aerospace structures and engine components. - Continue analyzing approaches to address the variability inherent in aerospace systems and materials to quantify the impact of that variability on nondestructive inspection capability and reliability.												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602102F / <i>Materials</i>		Project (Number/Name) 624349 / <i>Materials Technology for Sustainment</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
- Continue validating advanced sensing technologies to detect and characterize changes in material properties, damage evolution, and other factors that detrimentally affect aerospace systems. - Continue improving methods to acquire and analyze data to facilitate improved characterization, registration, and tracking of degradation and damage of specialty materials that enables/ensures more affordable coatings assessment. - Continue validating tools to improve characterization and failure modes of specialty multilayer coatings. - Continue developing automation and robotic technologies for visual inspections that will realize human-assisted inspection capabilities and begin to provide capabilities for automated multi-spectral characterization. - Continue development of miniaturized nondestructive evaluation/inspection capabilities. FY 2026 Plans: - Continue advancing non-destructive evaluation (NDE) modeling/simulation capabilities and leverage these advancements to enhance the detection, characterization, and quantification of damage in realistic aerospace structures and engine components. These improved damage assessments will increase component availability and ensure structural integrity, ultimately reducing maintenance actions. - Continue quantifying the impact of material variability on nondestructive inspection capability and reliability in weapon system components and aerospace structures. - Continue validating sensing technologies, such as ultrasound, eddy current, and x-ray computed tomography for detecting and characterizing material property changes and damage evolution in aerospace systems. This will improve predictive maintenance, increase availability, and reduce unnecessary maintenance while ensuring structural integrity. - Continue improving sensing technologies and digitization methods to enable faster, more reliable characterization, registration, and tracking of degradation and damage in specialty materials, leading to more affordable coatings assessments. - Continue validating tools to improve characterization and failure modes of specialty multilayer coatings on aircraft. - Continue developing automation and robotic technologies for visual nondestructive assessments that will realize human assisted inspection capabilities; begin to provide capabilities for automated multi-spectral characterization to increase mission availability while ensuring integrity and to reduce manhours required for inspection. - Continue developing technologies, including conventional robotics, miniaturized/highly-flexible soft robotics and sensors, and augmented data analysis, to reduce inspection time and burden on maintainers. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 funding decreased by \$0.574 million from FY 2025 due to reduced emphasis in variability inherent in aerospace systems and programmatic adjustments within the Science and Technology portfolio that reflects a strategic realignment.					
Title: Materials/Processes for Affordable Survivability			10.943	12.469	12.044
Description: In FY 2026, this effort was renamed from "Production and Repair Technologies" to "Materials/Processes for Affordable Survivability" to more accurately capture its emphasis on durable and survivable materials.					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602102F / <i>Materials</i>	Project (Number/Name) 624349 / <i>Materials Technology for Sustainment</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
This effort develops and matures emerging capabilities, information, and materials/processes to deliver cost-effective technologies to enhance mission capability, ensure material integrity and mission readiness throughout the life cycle of advanced aircraft and weapons systems for the Department of the Air Force. FY 2025 Plans: - Continue developing (to include via mishap evaluation) and communicating to the field, best practices to ensure repeatability of advanced materials and processes technology to repair and extend the life of Department of the Air Force systems. Further refine through demonstration the understanding of metal adhesion for increased durability in coatings and repair limits for emerging Department of the Air Force systems. - Continue improving the service life of advanced materials, processes and designs for improved repair and maintainability and life cycle cost of outer mold line coatings, access panel treatments, and multifunctional systems. - Continue to further develop novel particle/fiber surface treatment technologies and processes to reduce maintenance costs of specialty materials. FY 2026 Plans: - Continue to identify and communicate best practices for ensuring repeatable quality and performance of specialty materials (e.g., ceramics, coatings, adhesives, resins) for assured material integrity and mission readiness throughout the life cycle of Department of the Air Force aircraft and weapon systems. Furthermore, demonstrations will refine the understanding of material durability and repair limits for emerging systems to reduce maintenance needs. - Continue accelerating the development of advanced materials, processes, and designs to improve the durability, maintainability, and repair of outer mold line coatings, flexible access panel treatments, and multifunctional sensor systems, thereby increasing mission availability and readiness. - Continue advancing specialty material surface treatment technologies and processes that enhance mission capability and reduce maintenance costs. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 funding decreased by \$0.425 million from FY 2025 due to reduced emphasis on particle/fiber surface treatments and programmatic adjustments within the Science and Technology portfolio that reflects a strategic realignment.			
Title: Failure Analysis and Mishap Prevention Technologies Description: In FY 2026, this effort was renamed from "Failure Analysis Technologies" to "Failure Analysis and Mishap Prevention Technologies" to encompass both preemptive mishap prevention and post-failure analysis of materials, components, and systems.		16.412	18.704
			18.064

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602102F / <i>Materials</i>	Project (Number/Name) 624349 / <i>Materials Technology for Sustainment</i>
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024
This effort rapidly generates and deploys solutions for critical material and process challenges impacting weapon systems across their life cycle — from research and development through acquisition and operations. This accelerated approach focuses on delivering timely knowledge and technical insights to prevent operational mishaps and ensure weapon system effectiveness. FY 2025 Plans: - Continue performing and increasing efficiency of quick response failure analyses and materials investigations. - Continue the development and investigate improved analysis techniques to determine and prevent root cause materials failure/degradation. - Continue developing and providing advanced materials and processing solutions to ensure warfighter systems availability and safety of flight. - Continue refining development of functional materials failure analysis capabilities. - Continue analyzing and validating advanced electrostatic discharge protection technologies and procedures for emerging avionics subsystems. - Continue transitioning advanced test and characterization methods for analyzing electrical and structural failures of emerging materials. - Continue development of new, more durable materials and protection for high power wiring technologies, and advanced materials. FY 2026 Plans: - Continue providing rapid response electronic and structure failure investigations and transitioning materials and processing lessons learned for mishap prevention and accelerated system solutions. - Continue the research and development of improved materials and processing analysis techniques, nondestructive inspection and test methods to prevent material system failure/degradation in production and in service. - Continue developing and prototyping advanced materials and processing solutions, including technology implementation support, to accelerate warfighter system availability and enhance flight safety. - Continue refining development and application of material system failure analysis capabilities to include metals, polymer matrix composites, elastomers, adhesives, electronics, electrical systems and others. - Continue analyzing and validating advanced high power and electrostatic discharge protection technologies and procedures for emerging systems, avionics subsystems and support processes. - Continue transitioning advanced material processing, characterization, and procedural methods into Department of Defense/ national specifications and standards to ensure the stability, quality, and safety of emerging electrical and structural materials and processes. FY 2025 to FY 2026 Increase/Decrease Statement:		FY 2025
		FY 2026

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602102F / <i>Materials</i>	Project (Number/Name) 624349 / <i>Materials Technology for Sustainment</i>	

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2024	FY 2025	FY 2026
FY 2026 funding decreased by \$0.640 million from FY 2025 due to reduced emphasis on protection of high power wiring and certain advanced materials and programmatic adjustments within the Science and Technology portfolio that reflects a strategic realignment.			
Accomplishments/Planned Programs Subtotals	42.084	47.959	46.320

	FY 2024	FY 2025
Congressional Add: Program increase - multi-functional protective materials	9.864	0.000
FY 2024 Accomplishments: Conducted Congressionally directed efforts.		
FY 2025 Plans: Not applicable		
Congressional Adds Subtotals	9.864	0.000

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

Remarks

D. Acquisition Strategy
Not Applicable.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force	Date: June 2025

Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
3600: <i>Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research</i>	PE 0602201F / <i>Aerospace Vehicle Technologies</i>											
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
Total Program Element	0.000	188.530	15.235	0.000	0.000	0.000	-	-	-	-	-	-
622401: <i>Structures</i>	0.000	74.994	0.000	0.000	0.000	0.000	-	-	-	-	-	-
622403: <i>Flight Controls and Pilot-Vehicle Interface</i>	0.000	37.860	0.000	0.000	0.000	0.000	-	-	-	-	-	-
622404: <i>Aeromechanics</i>	0.000	10.135	0.000	0.000	0.000	0.000	-	-	-	-	-	-
622405: <i>High Speed Systems Technology</i>	0.000	52.619	0.000	0.000	0.000	0.000	-	-	-	-	-	-
625172: <i>NUCLEAR SYSTEM TECHNOLOGY</i>	0.000	12.922	15.235	0.000	0.000	0.000	-	-	-	-	-	-

Note

Effective FY 2026, nuclear system technology efforts under Aerospace Vehicle Technologies (PE 0602201F, Project 625172) will transfer to to Nuclear Delivery Systems Technology Exploration (PE 0602336F, Project 623360) to enhance transparency and traceability of the nuclear Science & Technology portfolio.

A. Mission Description and Budget Item Justification

This program investigates, develops, and analyzes aerospace vehicle technologies in the primary areas of high speed systems, autonomy and flight control technologies, aeromechanics, structure systems and nuclear system technology. The effort has five current projects, each focusing on a technology area critical to the Department of the Air Force. The High Speed Systems Technology project develops component level vehicle technologies for expendable and reusable high speed/hypersonic aerospace systems. The Flight Controls and Pilot-Vehicle Interface project develops technologies that enable affordable mass and maximum capabilities for manned, remotely-piloted and autonomous aerospace vehicles. The Aeromechanics and Integration project designs advanced aerodynamic vehicle configurations that are developed and analyzed through simulations, experiments, and multi-disciplinary analyses. It also develops design techniques, incorporating vehicle, inter-vehicle, and intra-vehicle control systems. The Structures project develops and exploits new materials, and fabrication processes. The Nuclear System Technology project provides science and technology to preserve nuclear deterrence for future generations.

In FY 2025, the RDT&E Budget Activity 02 (BA02) Aerospace Vehicles Technologies efforts and activities under PE 0602201F, was transferred to PE 0602203F, Aerospace Propulsion for increased integration between airframe, flight control, propulsion, electrical, power and thermal management.

In FY 2025, the entirety of PE 0602201F, Aerospace Vehicle Technologies, Project 622401 Structures, was transferred to PE 0602203F, Aerospace Propulsion, Project 622401 Structures.

In FY 2025, the entirety of PE 0602201F, Aerospace Vehicle Technologies, Project 622403, Flight Controls and Pilot-Vehicle Interface, was transferred to PE 0602203F, Aerospace Propulsion, Project 622403 Flight Controls and Pilot-Vehicle Interface.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force				Date: June 2025		
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research		R-1 Program Element (Number/Name) PE 0602201F / Aerospace Vehicle Technologies				
In FY 2025, the entirety of PE 0602201F, Aerospace Vehicle Technologies, Project 622404, Aeromechanics, was transferred to PE 0602203F, Aerospace Propulsion, Project 622401 Structures.						
In FY 2025, the entirety of PE 0602201F, Aerospace Vehicle Technologies, Project 622405, High Speed Systems Technology, was transferred to PE 0602203F, Aerospace Propulsion, Project 622405 High Speed Systems Technology.						
This program element may include necessary civilian pay expenses required to manage, execute, and deliver science & technology capabilities. The use of program funds in this program element would be in addition to the civilian pay expenses budgeted in program elements 0601102F, 0602020F, 0602102F, 0602203F,0602202F, 0602204F, 0602602F, 0602605F, 0602788F, 0602298F, and 1206601SF.						
This program element may include necessary expenses to support the operation and maintenance of facilities to manage, execute, and deliver science and technology capabilities.						
This program is in Budget Activity 2, Applied Research because this budget activity includes studies, investigations, and non-system specific technology efforts directed toward general military needs with a view toward developing and evaluating the feasibility and practicality of proposed solutions and determining their parameters.						
B. Program Change Summary (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Previous President's Budget		161.268	5.235	4.958	0.000	4.958
Current President's Budget		188.530	15.235	0.000	0.000	0.000
Total Adjustments		27.262	10.000	-4.958	0.000	-4.958
• Congressional General Reductions		0.000	0.000			
• Congressional Directed Reductions		0.000	0.000			
• Congressional Rescissions		0.000	0.000			
• Congressional Adds		37.500	10.000			
• Congressional Directed Transfers		0.000	0.000			
• Reprogrammings		0.000	0.000			
• SBIR/STTR Transfer		-3.787	0.000			
• Other Adjustments		-6.451	0.000	-4.958	0.000	-4.958
Congressional Add Details (\$ in Millions, and Includes General Reductions)						
Project: 622401: Structures						
Congressional Add: Program increase: Low-Cost Rapid Aerospace Fabrication Technology						
Congressional Add: Program Increase: Aerospace Engineering Systems Security Integration						
		FY 2024	FY 2025			
		6.376	-			
		4.904	-			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research</i>		R-1 Program Element (Number/Name) PE 0602201F / <i>Aerospace Vehicle Technologies</i>	
<u>Congressional Add Details (\$ in Millions, and Includes General Reductions)</u>		FY 2024	FY 2025
Congressional Add Subtotals for Project: 622401		11.280	-
Project: 622405: <i>High Speed Systems Technology</i>			
Congressional Add: <i>Program increase: collaborative hypersonic demonstration</i>		10.790	-
Congressional Add: <i>Program increase: Full Scale Determinant Assembly for Hypersonic Airframe Structures</i>		4.904	-
Congressional Add Subtotals for Project: 622405		15.694	-
Project: 625172: <i>NUCLEAR SYSTEM TECHNOLOGY</i>			
Congressional Add: <i>Program Increase - automated low-cost aerostructure mass production</i>		-	10.000
Congressional Add: <i>Program Increase: Hypersonic Air Breather Manufacturing Industrial Base Expansion</i>		9.809	-
Congressional Add Subtotals for Project: 625172		9.809	10.000
Congressional Add Totals for all Projects		36.783	10.000
<u>Change Summary Explanation</u> FY 2026 funding decreased by \$4.958 million. The decrease is due to the transfer of Project 625172, Nuclear System Technology, to PE 0602336F, Technology Exploration, to be traceable to the nuclear science and technology portfolio.			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602201F / Aerospace Vehicle Technologies				Project (Number/Name) 622401 / Structures			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
622401: Structures	0.000	74.994	0.000	0.000	0.000	0.000	-	-	-	-	-	-
A. Mission Description and Budget Item Justification												
This project develops advanced structures concepts to exploit new materials and fabrication processes and investigates new concepts and design techniques. New structural concepts include low cost design and fabrication techniques, incorporating subsystem hardware items and adaptive mechanisms into the aerospace structures and/or skin of the platform.												
In FY 2025, the entirety of PE 0602201F, Aerospace Vehicle Technologies, Project 622401 Structures, was transferred to PE 0602203F, Aerospace Propulsion, Project 622401 Structures for increased integration between airframe, flight control, propulsion, electrical, power and thermal management.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2024	FY 2025	FY 2026	
Title: Vehicle Design Technologies									17.125	0.000	0.000	
Description: Develop methodologies to reduce the cost and time involved from design to full-scale testing of structural concepts and aerospace systems.												
FY 2025 Plans: - Starting in FY2025, this work performed under PE 0602203F, Aerospace Propulsion, Project 622401, Structures, Vehicle Design Technologies effort.												
FY 2026 Plans: Not Applicable												
FY 2025 to FY 2026 Increase/Decrease Statement: Not Applicable												
Title: Structural Concepts									23.516	0.000	0.000	
Description: Develop design methods, processes, and lightweight, adaptive, and multifunctional structural concepts to capitalize on new materials, multi-role considerations, and technology integration into aircraft systems.												
FY 2025 Plans: - Starting in FY2025, this work is performed under PE 0602203F, Aerospace Propulsion, Project 622401, Structures, Structural Concepts effort.												
FY 2026 Plans:												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602201F / Aerospace Vehicle Technologies	Project (Number/Name) 622401 / Structures		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
Not Applicable					
FY 2025 to FY 2026 Increase/Decrease Statement: Not Applicable					
Title: Next Generation Aerodynamic Technologies Description: Develop and assess technologies for the next generation of multi-role large aircraft. FY 2025 Plans: - Starting in FY2025, this work is performed under PE 0602203F, Aerospace Propulsion, Project 622401, Structures, Next Generation Aerodynamic Technologies effort. FY 2026 Plans: Not Applicable FY 2025 to FY 2026 Increase/Decrease Statement: Not Applicable			6.878	0.000	0.000
Title: Aircraft Integration Technologies Description: Develop enabling technologies to allow efficient and effective integration of propulsion, weapons, and subsystems into current and future air vehicles. FY 2025 Plans: - Starting in FY2025, this work is performed under PE 0602203F, Aerospace Propulsion, Project 622401, Structures, Aircraft Integration Technologies. FY 2026 Plans: Not Applicable FY 2025 to FY 2026 Increase/Decrease Statement: Not Applicable			16.195	0.000	0.000
Accomplishments/Planned Programs Subtotals			63.714	0.000	0.000
			FY 2024	FY 2025	
Congressional Add: Program increase: Low-Cost Rapid Aerospace Fabrication Technology			6.376	-	

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025														
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602201F / Aerospace Vehicle Technologies	Project (Number/Name) 622401 / Structures														
		<table border="1"><tr><th>FY 2024</th><th>FY 2025</th></tr><tr><td colspan="2">FY 2024 Accomplishments: Conduct Congressionally directed efforts. This effort will be executed in Program 0602201F, Aerospace Vehicle Technologies, Project 622401, Structures.</td></tr><tr><td>4.904</td><td>-</td></tr><tr><td colspan="2">Congressional Add: Program Increase: Aerospace Engineering Systems Security Integration</td></tr><tr><td colspan="2">FY 2024 Accomplishments: Conduct Congressionally directed efforts. This effort will be executed in Program 0602201F, Aerospace Vehicle Technologies, Project 622401, Structures.</td></tr><tr><td>11.280</td><td>-</td></tr><tr><td colspan="2">Congressional Adds Subtotals</td></tr></table>	FY 2024	FY 2025	FY 2024 Accomplishments: Conduct Congressionally directed efforts. This effort will be executed in Program 0602201F, Aerospace Vehicle Technologies, Project 622401, Structures.		4.904	-	Congressional Add: Program Increase: Aerospace Engineering Systems Security Integration		FY 2024 Accomplishments: Conduct Congressionally directed efforts. This effort will be executed in Program 0602201F, Aerospace Vehicle Technologies, Project 622401, Structures.		11.280	-	Congressional Adds Subtotals	
FY 2024	FY 2025															
FY 2024 Accomplishments: Conduct Congressionally directed efforts. This effort will be executed in Program 0602201F, Aerospace Vehicle Technologies, Project 622401, Structures.																
4.904	-															
Congressional Add: Program Increase: Aerospace Engineering Systems Security Integration																
FY 2024 Accomplishments: Conduct Congressionally directed efforts. This effort will be executed in Program 0602201F, Aerospace Vehicle Technologies, Project 622401, Structures.																
11.280	-															
Congressional Adds Subtotals																
C. Other Program Funding Summary (\$ in Millions) N/A																
Remarks																
D. Acquisition Strategy Not applicable.																

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602201F / Aerospace Vehicle Technologies				Project (Number/Name) 622403 / Flight Controls and Pilot-Vehicle Interface			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
622403: Flight Controls and Pilot-Vehicle Interface	0.000	37.860	0.000	0.000	0.000	0.000	-	-	-	-	-	-
A. Mission Description and Budget Item Justification												
This project develops technologies that enable maximum affordable capability from manned, remotely-piloted, and autonomous aerospace vehicles. Advanced control, automation, and autonomy technologies are developed for maximum vehicle performance throughout the flight envelope and simulated in full-scale, surrogate, and virtual environments. Resulting technologies contribute significantly towards the development of reliable autonomous or remotely piloted air vehicles, hypersonic aircraft, and extended-life legacy aircraft. In FY 2025, the entirety of PE 0602201F, Aerospace Vehicle Technologies, Project 622403 Flight Controls and Pilot-Vehicle Interface, was transferred to PE 0602203F, Aerospace Propulsion, Project 622403 Flight Controls and Pilot-Vehicle Interface for increased integration between airframe, flight control, propulsion, electrical, power and thermal management.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2024	FY 2025	FY 2026	
Title: Advanced Flight Controls Technologies									8.881	0.000	0.000	
Description: Develop technologies for advanced control-enabled capabilities, including flight controls, components, integrated vehicle management systems, and software and system certification techniques for both manned/unmanned and remotely piloted aircraft.												
FY 2025 Plans:												
- Starting in FY2025, this work is performed under PE 0602203F, Aerospace Propulsion, Project 622403, Flight Controls and Pilot-Vehicle Interface, Advanced Flight Controls Technologies effort.												
FY 2026 Plans:												
Not Applicable												
FY 2025 to FY 2026 Increase/Decrease Statement:												
Not Applicable												
Title: Manned and Unmanned Teaming Technologies									21.686	0.000	0.000	
Description: Develop technology for flight control systems that will permit safe interoperability between manned and remotely piloted aircraft and effective teaming in adverse and contested environments.												
FY 2025 Plans:												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602201F / <i>Aerospace Vehicle Technologies</i>	Project (Number/Name) 622403 / <i>Flight Controls and Pilot-Vehicle Interface</i>		
B. Accomplishments/Planned Programs (\$ in Millions) - Starting in FY2025, this work is performed under PE 0602203F, Aerospace Propulsion, Project 622403, Flight Controls and Pilot-Vehicle Interface, Manned and Unmanned Teaming Technologies effort. FY 2026 Plans: Not Applicable FY 2025 to FY 2026 Increase/Decrease Statement: Not Applicable		FY 2024	FY 2025	FY 2026
Title: Flight Controls Technologies Modeling and Simulation Description: Develop tools and methods for capitalizing on simulation-based research and development of future aerospace vehicles. FY 2025 Plans: - Starting in FY2025, this work is performed under PE 0602203F, Aerospace Propulsion, Project 622403, Flight Controls and Pilot-Vehicle Interface, Flight Controls Technologies Modeling and Simulation effort. FY 2026 Plans: Not Applicable FY 2025 to FY 2026 Increase/Decrease Statement: Not Applicable		7.293	0.000	0.000
Accomplishments/Planned Programs Subtotals		37.860	0.000	0.000
C. Other Program Funding Summary (\$ in Millions) N/A Remarks D. Acquisition Strategy Not applicable.				

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602201F / <i>Aerospace Vehicle Technologies</i>				Project (Number/Name) 622404 / <i>Aeromechanics</i>			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
622404: <i>Aeromechanics</i>	0.000	10.135	0.000	0.000	0.000	0.000	-	-	-	-	-	-
A. Mission Description and Budget Item Justification This project develops aerodynamic configurations of a broad range of revolutionary, affordable aerospace vehicles. It matures and applies modeling and numerical simulation methods for fast and affordable aerodynamics prediction and integrates and demonstrates multi-disciplinary advances in airframe, propulsion, weapon, and air vehicle control integration. In FY 2025, the entirety of PE 0602201F, Aerospace Vehicle Technologies, Project 622404 Aeromechanics, was transferred to PE 0602203F, Aerospace Propulsion, Project 622401 Structures for increased integration between airframe, flight control, propulsion, electrical, power and thermal management.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2024	FY 2025	FY 2026	
Title: Aerodynamic Systems Technologies Description: Develop aerodynamic assessment prediction methods centered on expanding the design capabilities of future air vehicles. FY 2025 Plans: Starting in FY2025, this work is performed under PE 0602203F, Aerospace Propulsion, Project 622401, Structures, Aerodynamic Systems Technologies effort in order to effectively and efficiently align resources to Aerospace Systems Core Technical Competencies effort. FY 2026 Plans: Not Applicable FY 2025 to FY 2026 Increase/Decrease Statement: Not Applicable									10.135	0.000	0.000	
Accomplishments/Planned Programs Subtotals									10.135	0.000	0.000	
C. Other Program Funding Summary (\$ in Millions) N/A Remarks												
D. Acquisition Strategy Not applicable.												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602201F / Aerospace Vehicle Technologies				Project (Number/Name) 622405 / High Speed Systems Technology			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
622405: High Speed Systems Technology	0.000	52.619	0.000	0.000	0.000	0.000	-	-	-	-	-	-
A. Mission Description and Budget Item Justification												
This effort investigates, analyzes, and develops high speed/hypersonic aerospace vehicle technologies. Advanced high temperature structures concepts are explored and developed to exploit new materials, fabrication processes, and design techniques. Advanced aerodynamic vehicle configurations are developed and analyzed through simulations, experiments, and multi-disciplinary analyses. Advanced subsystem, integration and analysis technologies are developed and simulated for hypersonic vehicles. These technologies will enable future high speed weapons and platforms; intelligence, surveillance, and reconnaissance systems; and space access vehicles.												
In FY 2025, the entirety of PE 0602201F, Aerospace Vehicle Technologies, Project 622405 High Speed Systems Technology, was transferred to PE 0602203F, Aerospace Propulsion, Project 622405 High Speed Systems Technology for increased integration between airframe, flight control, propulsion, electrical, power and thermal management.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2024	FY 2025	FY 2026	
Title: High Speed Systems Technology									21.439	0.000	0.000	
Description: Develop design analysis methods and technologies for high speed systems at extreme flight conditions.												
FY 2025 Plans: - Starting in FY 2025, this work is performed under PE 0602203F, Aerospace Propulsion, Project 622405, High Speed Systems Technology, High Speed Systems Technology effort.												
FY 2026 Plans: Not Applicable												
FY 2025 to FY 2026 Increase/Decrease Statement: Not Applicable												
Title: High Speed Vehicle Aeromechanics and Integration									15.486	0.000	0.000	
Description: Develop new and improved components, concepts, and designs for sustained flight of high-speed/hypersonic expendable and re-useable vehicles. Conduct analyses of high speed/hypersonic vehicles to enable revolutionary capabilities.												
FY 2025 Plans:												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602201F / <i>Aerospace Vehicle Technologies</i>	Project (Number/Name) 622405 / <i>High Speed Systems Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Starting in FY2025, this work is performed under PE 0602203F, Aerospace Propulsion, Project 622405, High Speed Systems Technology, High Speed Vehicle Aeromechanics and Integration. FY 2026 Plans: Not Applicable FY 2025 to FY 2026 Increase/Decrease Statement: Not Applicable			
Accomplishments/Planned Programs Subtotals		36.925	0.000
		FY 2024	FY 2025
Congressional Add: Program increase: collaborative hypersonic demonstration		10.790	-
FY 2024 Accomplishments: Conduct Congressionally directed efforts. This effort will be executed in Program 0602201F, Aerospace Vehicle Technologies, Project 622405, High Speed Systems Technology.			
Congressional Add: Program increase: Full Scale Determinant Assembly for Hypersonic Airframe Structures		4.904	-
FY 2024 Accomplishments: Conduct Congressionally directed efforts. This effort will be executed in Program 0602201F, Aerospace Vehicle Technologies, Project 622405, High Speed Systems Technology.			
Congressional Adds Subtotals		15.694	-
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
Not applicable.			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602201F / Aerospace Vehicle Technologies				Project (Number/Name) 625172 / NUCLEAR SYSTEM TECHNOLOGY			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
625172: NUCLEAR SYSTEM TECHNOLOGY	0.000	12.922	15.235	0.000	0.000	0.000	-	-	-	-	-	-
Note In FY 2026, the entirety of PE 0602201F, Aerospace Vehicle Technologies, Project 625172, Nuclear System Technology, is transferred to PE 0602336F, Project 623360, Technology Exploration, in order to enhance transparency and traceability of the nuclear Science and technology portfolio.												
A. Mission Description and Budget Item Justification This project provides sustaining science and technology to preserve nuclear deterrence for future generations, develops complimentary projects to inform future systems, establishing inter-agency partnerships for Modeling & Simulation and test platforms, and coordinates with existing programs for next generation strategic systems development and test platforms.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2024	FY 2025	FY 2026	
Title: Nuclear Technologies									3.113	5.235	0.000	
Description: Develop nuclear-related technologies to support National requirements for nuclear deterrence operations including environmental modeling and simulation on re-entry systems.												
FY 2025 Plans: - Continue development of nuclear re-entry systems M&S coordinated with efforts in PE 0603273F. - Continue development and testing of advanced numerical methods for implementation of dynamic techniques for improved event discrimination and characterization for local and regional seismic events. - Continue developing earth models and statistical approaches to the behavior of discriminants for local and regional seismic events. - Continue model and algorithm development and testing of detection techniques to advance the ground-based seismic nuclear monitoring mission through improved anomaly detection, attribution, and protection. - Continue enhanced seismic monitoring with distributed acoustic sensing with machine learning data analysis approach to analyze geometries for noise reduction. - Continue advanced waveform tomography with 3D source simulations, linear wave propagation simulations and earth structure models to enhance prediction capabilities. - Continue aerothermal model validation and development through various testing mechanisms to include the development of integrated end-to-end physics-based modeling suite to predict aerodynamic flow fields, signatures, and material characterizations. - Continue to improve modeling fidelity of plasma chemistry through machine learning models for product state distributions.												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force							Date: June 2025				
Appropriation/Budget Activity 3600 / 2				R-1 Program Element (Number/Name) PE 0602201F / Aerospace Vehicle Technologies			Project (Number/Name) 625172 / NUCLEAR SYSTEM TECHNOLOGY				
B. Accomplishments/Planned Programs (\$ in Millions)							FY 2024	FY 2025	FY 2026		
- Continue advanced development of modeling and simulation tools used in predicting the physics-based effects that result in leading edge shape change of hypersonic vehicles. Initiate weather effects testing on reentry vehicles to gather data for validating current modeling and simulation tools, and for generating new algorithms used for predicting how a reentry vehicle reacts to harsh weather in low atmosphere. - Continue analysis of strategic command, control, and communications to identify space-layer technologies of interest. - Continue development of test and integration plans for hypersonic reentry flight testing of government payloads. - Continue development of hypersonic technology payloads, to include inertial sensors, mm-Wave communications, spectral and hyperspectral sensors, and heatshield materials, to mature during flight test activities. - Initiate validation of M&S results of hypersonic aerothermal chemistry and shock-layer behavior with experimental flight test data. FY 2026 Plans: Not Applicable FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by 5.235 million due to the transfer of Project 625172, Nuclear System Technology, to PE 0602336F, Technology Exploration, to be traceable to the nuclear science and technology portfolio.											
Accomplishments/Planned Programs Subtotals							3.113	5.235	0.000		
							FY 2024	FY 2025			
Congressional Add: Program Increase - automated low-cost aerostructure mass production							-	10.000			
FY 2025 Plans: Conduct Congressionally directed efforts. Congressional add to be moved to 0602203F / 622401 for execution.											
Congressional Add: Program Increase: Hypersonic Air Breather Manufacturing Industrial Base Expansion							9.809	-			
FY 2024 Accomplishments: Conduct Congressionally directed efforts.											
Congressional Adds Subtotals							9.809	10.000			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
• RDTE 03 0603273F: Science & Technology for Nuclear Re-entry Systems	65.088	91.885	128.407	-	128.407	-	-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025	
Appropriation/Budget Activity 3600 / 2				R-1 Program Element (Number/Name) PE 0602201F / Aerospace Vehicle Technologies				Project (Number/Name) 625172 / NUCLEAR SYSTEM TECHNOLOGY			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
• RDTE 03 0603211F: Aerospace Technology Dev/Demo	88.628	0.000	0.000	-	0.000	-	-	-	-	-	-
• RDTE 02 0602336F: Nuclear Delivery Systems Tech Exploration	0.000	0.000	4.969	-	4.969	-	-	-	-	-	-
Remarks											
D. Acquisition Strategy											
Not applicable											

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force **Date:** June 2025

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research</i>	R-1 Program Element (Number/Name) PE 0602202F / <i>Human Effectiveness Applied Research</i>

COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
Total Program Element	0.000	138.098	137.425	133.928	0.000	133.928	-	-	-	-	-	-
620200: <i>Enterprise Transformational Appld Research</i>	0.000	0.191	0.000	0.000	0.000	0.000	-	-	-	-	-	-
621123: <i>Learning and Operational Readiness</i>	0.000	21.961	13.989	21.292	0.000	21.292	-	-	-	-	-	-
625328: <i>Biosciences Performance</i>	0.000	26.795	47.287	33.093	0.000	33.093	-	-	-	-	-	-
625329: <i>Warfighter Interfaces and Teaming</i>	0.000	42.226	30.019	46.105	0.000	46.105	-	-	-	-	-	-
627757: <i>Bioeffects</i>	0.000	46.925	46.130	33.438	0.000	33.438	-	-	-	-	-	-

Note

Note:

- FY26 increase (net) \$13.171 million due to increased Department of the Air Force emphasis on human effectiveness research, in particular related to man-machine teaming and supervisory control of collaborative combat aircraft, and learning methods and skill training to support multi-capable airmen and agile combat employment.
- Learning and Operational Readiness Readiness Project 621123 "Personalized Learning" thrust activities and resources are merged into the "Learning and Operational Training" thrust. Similarly "Cognitive Modeling" thrust activities and resources are merged into the "Digital Models of Cognition" thrust.
- Warfighter Interfaces and Teaming Project 625329 "Collaborative Interfaces and Teaming" thrust activities and resources are merged into the "the Distributed Teaming and Communication" thrust. Similarly "Multisensory Perceptions and Communication" thrust activities and resources are merged into the "Distributed Teaming and Communication" thrust.

A. Mission Description and Budget Item Justification

This program conducts applied research in the area of airmen training, airmen performance sustainment, bioeffects, and understanding and shaping adversarial behavior, maturing technology and readying it for eventual integration into combat and combat support systems. The Learning and Operational Readiness project conducts research to increase the agility of training to operate aircraft, weapons, logistics, intelligence, and space systems while advancing learning and performance assessment science and practice. The Biosciences Performance project conducts research to discover, demonstrate, and transition capabilities which optimize and safe-guard Airman and Guardian physical and cognitive performance allowing for the maximum impact during combat and contingency operations. The Warfighter Interfaces and Teaming project conducts research to discover, develop, and transition advanced interface technology, decision aiding tools, and situationally-adaptive augmentation methods to seamlessly integrate Airmen and intelligent machines into maximally collaborative warfighting teams. The Bioeffects project conducts novel and operational directed energy bioeffects research, exposure effects analysis and develops national/international exposure standards for the Air Force to enable, sustain, and enhance Airman performance and protection during deployment of directed energy systems.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research	R-1 Program Element (Number/Name) PE 0602202F I Human Effectiveness Applied Research	
The Air Force Research Laboratory (AFRL) is focused on high-impact, multi-domain science & technology (S&T) solutions that drive innovation now while laying the groundwork for the Air and Space Force to win the future fight. AFRL effectively synchronizes the Department of the Air Force (DAF) S&T enterprise and workforce to align towards the most consequential DAF priorities and accelerate the delivery of game-changing S&T. This program element may include necessary expenses to support the operation and maintenance of facilities to manage, execute, and deliver science and technology capabilities. This program includes funding for the requisite DAF Science & Engineering (S&E) and mission enabling civilian workforce with the necessary technical competencies to develop, manage, and deliver science & technology capabilities. The use of program funds in this program element is in conjunction with the civilian pay expenses budgeted in the following program elements: 1206601SF, 0601102F, 0602020F, 0602102F, 0602203F, 0602204F, 0602298F, 0602336F, 0602602F, 0602605F, 0602788F, and 0603680F. In FY 2026, \$64.637 million is budgeted in this program for 349 direct Full-Time Equivalent (FTE) civilians. The Air Force Research Laboratory (AFRL) utilizes 10 USC 4091, "Authorities for certain positions at science and technology reinvention laboratories" to manage the workforce strength, structure, positions, and compensation. The FY 2026 request was reduced by \$0.427 million for Advisory and Assistance Services to promote efficiencies and advance the policies of the Administration in alignment with Executive Order 14222, "Implementing the President's Department of Government Efficiency Cost Efficiency Initiative." The FY 2026 request was reduced by \$6.733 million for civilian personnel to optimize the workforce in compliance with Executive Order 14210, "Implementing the President's Department of Government Efficiency Workforce Optimization Initiative." This program is in Budget Activity 2, Applied Research because this budget activity includes studies, investigations, and non-system specific technology efforts directed toward general military needs with a view toward developing and evaluating the feasibility and practicality of proposed solutions and determining their parameters.		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force				Date: June 2025	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
3600: Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research		PE 0602202F I Human Effectiveness Applied Research			
B. Program Change Summary (\$ in Millions)	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Previous President's Budget	146.921	138.204	128.433	0.000	128.433
Current President's Budget	138.098	137.425	133.928	0.000	133.928
Total Adjustments	-8.823	-0.779	5.495	0.000	5.495
• Congressional General Reductions	-1.400	0.000			
• Congressional Directed Reductions	0.000	-18.979			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	1.000	18.200			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-2.546	0.000			
• Other Adjustments	-5.877	0.000	5.495	0.000	5.495
Congressional Add Details (\$ in Millions, and Includes General Reductions)					
Project: 625328: Biosciences Performance					
Congressional Add: Program increase - project refuel					
Congressional Add: Program Increase - F-35 helmet mounted display system					
Congressional Add Subtotals for Project: 625328					
Congressional Add Totals for all Projects					
Change Summary Explanation					
- FY 2024 decrease of \$1.400 million due to civilian pay adjustments.					
- FY 2026 increased due to increased DAF emphasis on human effectiveness research, in particular related to man-machine teaming and supervisory control of collaborative combat aircraft, and learning methods and skill training to support multi-capable airmen and agile combat employment.					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602202F / Human Effectiveness Applie d Research				Project (Number/Name) 620200 / Enterprise Transformational Appld Research			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
620200: Enterprise Transformational Appld Research	0.000	0.191	0.000	0.000	0.000	0.000	-	-	-	-	-	-
A. Mission Description and Budget Item Justification This program element develops multidisciplinary applied research efforts to accelerate the technology pipeline of transformational capabilities by reducing risk and maturing the technology so it can transition in support of larger advanced technology development capability investments. These activities are selected to enable solutions to the DAFs highest priorities to include Operational Imperatives and Critical Technology Areas. The Explore effort engages traditional & nontraditional industry, government laboratories and academia through 12-24 month feasibility studies and demonstrations. The Seedlings for Disruptive Capabilities Program (SDCP) facilitates AFRL cross-disciplinary applied research to provide leap-ahead, high risk technology development. Modeling, simulation, and analyses activities will continue to explore transformational research analytic technologies to enable validated positions and provide a solid foundation with emphasis to predict future outcomes and technology needs, as well as looking for more seedlings to feed the transformational capability pipeline. Continue to advance future workforce development programs and broadening partnerships to deepen and expand the scientific and technology enterprise. Applied research efforts span a broad spectrum of activities, and established processes allow agility and flexibility to meet higher demand signals.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2024	FY 2025	FY 2026	
Title: Enterprise Transformational Applied Research									0.191	0.000	0.000	
Description: Enterprise Transformational Applied Research												
FY 2025 Plans: This work moved and is executed out of and described in the plans for Program PE 0602202F Enterprise Transformational Appld Research, Project 620200 Enterprise Transformational Appld Research effort.												
FY 2026 Plans: N/A												
Accomplishments/Planned Programs Subtotals									0.191	0.000	0.000	
C. Other Program Funding Summary (\$ in Millions) N/A Remarks D. Acquisition Strategy Not Applicable												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602202F / Human Effectiveness Applied Research				Project (Number/Name) 621123 / Learning and Operational Readiness			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
621123: Learning and Operational Readiness	0.000	21.961	13.989	21.292	0.000	21.292	-	-	-	-	-	-
Note - Learning and Operational Readiness Readiness Project 621123 "Personalized Learning" thrust activities and resources are moved into the "Learning and Operational Training" thrust. Similarly "Cognitive Modeling" thrust activities and resources are moved into the "Digital Models of Cognition" thrust.												
A. Mission Description and Budget Item Justification This project enables warfighter decision superiority by advancing the science and technology of human multi-sensory perception, learning, information processing, and action. Research is conducted in two focus areas: learning and operational training, and digital models of cognition. Digital Models of Cognition focuses on holistic models that work at understanding and prediction of mission effectiveness to maximize training effectiveness as well as to make human cognitive models available for other modeling, simulation, and analysis. Learning and operational training improves learning and understanding by linking evolving technology with understanding of how warfighters assimilate information and abilities. This project looks to establish a persistent, global experimentation, test, and training ecosystem that supports personalized, proficiency-based readiness for warfighters in joint all-domain operations, including work that supports Air Education and Training Command's undergraduate pilot training programs, Air Combat Command's fighter community, Air Force (AF) combat casualty care and enroute medical operations, human-machine teams executing Command, Control, Communications and Battle Management tasks, the development of Multi-Capable Airmen for maintenance and operations support, and the growing needs of the Unit States Space Force for space domain and cislunar operations. Using digital modeling, advancements will take into account human perception, cognition, and action in system development, wargaming, and operational planning, to support the development of human digital twins that can be integrated into AF Modeling and Simulation capabilities for training, and prediction of cognitive load and fatigue for maximum endurance operations in support of Air Mobility Command and Air Combat Command operational mission requirements.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2024	FY 2025	FY 2026	
Title: Personalized Learning									13.177	4.666	0.000	
Description: Research builds the foundation for long-term Operational Training and Test Infrastructure by creating capabilities that enhance live-virtual-constructive environments and integration, exploring environments and mechanisms to enable collaborative human-machine teams learning, researching individual and team measurement and assessment techniques, developing algorithms to enable a shift toward personalized and proficiency-based training and readiness management, and researching how advanced learning technologies like augmented and virtual reality can be used to increase the effectiveness and efficiency of training.												
FY 2025 Plans: - Continue research evaluating integrated human and machine personalized learning capabilities in mission-relevant laboratory.												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602202F / Human Effectiveness Applied Research	Project (Number/Name) 621123 / Learning and Operational Readiness		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Continue research integrating multi-objective optimization and team proficiency assessment into a common ecosystem for synthetic operational training and testing. - Complete transition of proficiency measurement and prediction capabilities, including uncertainty quantification, to targeted domains such as language learning and recurring training areas. - Continue research evaluating the impact of training fidelity related to augmented, virtual, mixed, and extended reality on readiness. - Complete exploring methods and standards for assessing transfer of skill for just in time, novel mission training requirements for a peer fight in deployed and austere environments. - Complete mobile research platform for embedding in integrated training events for data collection in controlled, naturalistic environment. - Continue mechanisms for co-learning in teams of humans and machines to maximize collaboration and performance in a laboratory setting. FY 2026 Plans: - Move "research evaluating integrated human and machine personalized learning capabilities in mission-relevant laboratory" plans to the Learning and Operational Training thrust. - Move "research integrating multi-objective optimization and team proficiency assessment into a common ecosystem for synthetic operational training and testing" plans to the Learning and Operational Training thrust. - Move "research evaluating the impact of training fidelity related to augmented, virtual, mixed, and extended reality on readiness" plans to the Learning and Operational Training thrust. - Move "exploring methods and standards for assessing transfer of skill for just in time, novel mission training requirements for a peer fight in deployed and austere environments" plans to the Learning and Operational Training thrust. - Move "mechanisms for co-learning in teams of humans and machines to maximize collaboration and performance in a laboratory setting" plans to the Learning and Operational Training thrust. Personalized Learning thrust will be completed in FY25. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$4.666 million due to movement of Personalized Learning thrust activities and resources into the Learning and Operational Training thrust.				
Title: Learning and Operational Training		0.000	3.777	11.736
Description: Research that emphasizes learning and understanding in the context of evolving technology to facilitate more effective and more efficient Airman and Guardian training. This includes research to establish an ecosystem that maximizes mission effectiveness while minimizing costs by matching technologies to learning and performance needs; targeted investments to develop, demonstrate, and transition learning methods and technologies; high resolution human and system measurement to				

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602202F / <i>Human Effectiveness Applied Research</i>	Project (Number/Name) 621123 / <i>Learning and Operational Readiness</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
enable quantitative, proficiency-centric readiness assessment and prediction at the individual and team levels; and exploration of mechanisms and theory of interactive learning and collaborative training of humans and Artificial Intelligence-enabled machines to support mutual adaptation and understanding that fosters uniquely effective human-autonomy teams. A key focus area is ensuring physical and psychological fidelity requirements are met in training simulation testbeds to address the readiness needs of the operational Air and Space Forces. Competency modeling enables data-driven and theory-informed insights for instructors and adaptive training for Warfighters in multiple high-priority domains, including piloting; Intelligence, Surveillance, and Reconnaissance; and teaming. Competency modeling will benefit aircrew training; novel training methodologies, interventions, and metrics will support Air Education and Training Command training priorities; and novel human/Artificial Intelligence co-learning technologies will support space domain awareness and battle management. FY 2025 Plans: - Initiate research on how to apply theories, methods, and studies to support just in time training to accelerate the acquisition of expertise and increase performance resilience. - Initiate exploration and assessment of infrastructure needs to support training for a peer fight that enables the collection, contextualization, and application of data for performance assessment, readiness management, and personalization of competency-based instruction. - Initiate defining the methods and technologies to support the interactive learning between humans and AI-enabled technologies. FY 2026 Plans: - Continue research focused on how to apply theories, methods, and studies to support just-in-time training to accelerate the acquisition of expertise and increase performance resilience. Specific activities within this FY include analysis of just-in-time training needs and incorporating those needs into the Just-In-Time Tactical Tutor (JINTTACT) capability for aircraft crew-chiefs managing operations and maintenance for Air Combat Command; such as training F-35 engine technology, and F-16 refueling. - Initiate research to identify and define data tools, analytics, schemes, and models to enable training and readiness representations for digital engineering. Specific activities within this FY include design and validation of a learner competency model focused on undergraduate pilot training and a team-based competency model supporting Air Force Critical Care Air Transport Team training to meet Combatant Command Operational Plans requirements. - Continue exploration and assessment of infrastructure needs (including fidelity requirements) to support training for a peer fight that enables the collection, contextualization, and application of data for performance assessment, readiness management, and personalization of competency-based instruction. Specific activities within this FY include the development of a warfighter competency-based training environment fidelity requirements process, supporting the design and development of a blended (live-constructive-virtual) training environment capability, and a software tool prototype to elicit accurate warfighter-based fidelity parameter estimation.			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602202F / <i>Human Effectiveness Applied Research</i>		Project (Number/Name) 621123 / <i>Learning and Operational Readiness</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
- Continue defining the methods and technologies to support the interactive learning between humans and Artificial Intelligence-enabled technologies. Specific activities within this FY include generating adaptable, machine-readable representations of warfighter knowledge to enable real-time learning within training pipelines, simulation architectures, mission models, and intelligent tutors at diverse levels of autonomy to support Air Battle Management and Intelligence, Surveillance, and Reconnaissance missions. - Initiate exploration and validation of adaptive team training paradigms with relevant test and evaluation approaches to ensure uniquely effective human-autonomy teams. Specific activities within this FY include the development of a new method for evaluating and "red teaming" co-learning between Airman-and Artificial Intelligence-enabled technology at diverse levels of autonomy executing simulated Department of the Air Force missions, such as fighter air-to-air and air-to-ground missions. - Initiate identification and validation of algorithms to shape flexible, adaptive, shared representations between teammates. Specific activities include the application of a Team Dynamics Measurement System to inform and improve Airman and Guardian team processes by extracting actionable insights from communications data as well as initial studies focused on the development of an intelligent tutor system for space spatial awareness and decision aids for rendezvous proximity operations. - Continue research evaluating integrated human and machine personalized learning capabilities in a mission-relevant laboratory. This effort moved from the Personalized Learning thrust. Specific activities within this FY include a hybrid model combining Machine Language and cognitive model architectures to enhance proficiency for a broad spectrum of pilots in training as well as in support of foreign language acquisition for intel analysts. - Continue research integrating multi-objective optimization and team proficiency assessment into a common ecosystem for synthetic operational training and testing. This effort is moved from the Personalized Learning thrust. Specific activities within this FY include refinement of a comprehensive set of metrics, and a synthetic training environment for Airman team performance measurement in an operationally relevant synthetic training environment supporting enroute medical care and battle management. - Continue research evaluating the impact of training fidelity related to augmented, virtual, mixed, and extended reality on readiness. This effort is moved from the Personalized Learning thrust. Specific activities within this FY include the design of research to validate the optimal manipulation of training environment elements, and measures critical to specific mission competencies to understand impact of training environment fidelity, and ability to accurately anticipate these impacts to the overall training system. - Continue exploring methods and standards for assessing transfer of skill for just-in-time, novel mission training requirements for a peer fight in deployed and austere environments. This effort is moved from the Personalized Learning thrust. Specific activities within this FY include researching the transfer and skill acquisition among Air National Guard pilots transitioning from flying A-10 to F-16, performing a systematic assessment of what facilitates and what inhibits knowledge transfer to inform future training system development. - Continue mechanisms for co-learning of humans and machines to maximize collaboration and performance in a laboratory setting. This effort is moved from the Personalized Learning thrust. Specific activities within this FY include advancing simulation					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602202F / Human Effectiveness Applied Research	Project (Number/Name) 621123 / Learning and Operational Readiness		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
architectures and testing to evaluate Airman-Artificial Intelligence (AI)-enabled interactions at diverse levels of autonomy and initiating a test of the optimized results in a real operational environment. - Initiate the exploration of AI-enabled, continuous learning methods to maximize skill training and increase knowledge acquisition and retention, develop course-of-action selection and decision-making support through co-learning between Airmen and generative AI, as well as other technologies for uncertain environments, and the development of oko, a novel space simulation framework for probing Airman-machine team interactions at diverse levels of autonomy. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$7.959 million due to movement of Personalized Learning activities and resources into the Learning and Operational Training thrust, initiating work on Artificial Intelligence enabled learning methods to help team pilots with autonomous combat platforms such as Collaborative Combat Aircraft, the exploration and validation of adaptive team training paradigms, research on team training by shaping shared representations between teammates, developing advanced training technologies across multiple mission areas, accelerating training technology entrance into advanced technology demonstrations, and expanding testing to accelerate team-training activities for air battle management.				
Title: Cognitive Modeling Description: Research explores application of mathematical and computational modeling to understand the human mind, and factors that will enhance or degrade cognitive performance. Capabilities enable personalized learning by tracking individual learning, and targeting training interventions where/when needed. Research also explores applications for computer-generated forces with greater cognitive fidelity improving realism while reducing manpower costs for large, simulated scenarios. Also investigates algorithms that track and predict readiness and mission effectiveness based on influences of the mission context and individual stressors improving the fidelity of wargames, system development, and operational planning with better characterizations of human capacities and limitations. FY 2025 Plans: - Complete capability for real-time fatigue monitoring and prediction for mobility and maintainer community. - Complete real-time, personalized tracking of fatigue in operationally relevant environments, including impacts of countermeasures. - Complete laboratory capability profile workload and cognitive performance in real-time, and assess and predict performance based on interacting effects of multiple cognitive modulators in a laboratory setting. - Continue research computational and mathematical frameworks for representing human performance across scales of analysis, components of cognition and performance, and levels of resolution for digital engineering applications. - Continue computational modeling capability for situational understanding through natural language interaction, information extraction, and information seeking in a laboratory context.		8.784	3.119	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602202F / <i>Human Effectiveness Applied Research</i>	Project (Number/Name) 621123 / <i>Learning and Operational Readiness</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Continue research to demonstrate autonomy-based dynamic task allocation based on operator workload with context sensitivity. FY 2026 Plans: - Move "research computational and mathematical frameworks for representing human performance across scales of analysis, components of cognition and performance, and levels of resolution for digital engineering applications" plans to the Digital Models of Cognition thrust. - Move "computational modeling capability for situational understanding through natural language interaction, information extraction, and information seeking in a laboratory context" plans to the Digital Models of Cognition thrust. - Move "research to demonstrate autonomy-based dynamic task allocation based on operator workload with context sensitivity" plans to the Digital Models of Cognition thrust. Cognitive Modeling thrust will be completed in FY25. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$3.119 million due to movement of Cognitive Modeling thrust activities and resources into the Digital Models of Cognition thrust.			
Title: Digital Models of Cognition Description: Research to identify computational and mathematical mechanisms to represent human perception, information processing, and behavior, including the integration of models that reflect the role of internal and external factors that modulate performance efficiency and effectiveness. Research area develops models of cognitive systems that support quantitative understanding and prediction of mission effectiveness for decision superiority. Develops analytic methods, models, and tradecraft that enables operators to improve Information-Related Capability. FY 2025 Plans: - Initiate computational cognitive modeling to enable quantitative understanding and prediction of mission effectiveness in the context of controlling crewed aircraft and Collaborative Combat Aircraft within the Next Generation Air Dominance family of systems for decision superiority. - Initiate experimentation on digital models that account for internal and external factors that modulate cognitive performance efficiency and effectiveness within tactical environments. - Initiate research to define descriptive and anticipatory analytics that derive from network and content data to inform assessment and decision making re: information maneuvers and strategies. FY 2026 Plans: - Continue computational cognitive modeling efforts to enable quantitative understanding and prediction of mission effectiveness in the context of controlling crewed aircraft and Collaborative Combat Aircraft within the Next Generation Air Dominance family of systems. Specific activities within this FY include generation of data relating to multi-asset management for future manned-		0.000	2.427
			9.556

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602202F / <i>Human Effectiveness Applied Research</i>		Project (Number/Name) 621123 / <i>Learning and Operational Readiness</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
unmanned multi-ship missions, and from this dataset a hierarchical task analysis will describe the decisions made during a strike mission. - Continue experimentation on digital models that account for internal and external factors that modulate cognitive performance efficiency and effectiveness within tactical environments. Specific activities within this FY include taking measurements of F-35 and C-130 interior noise to provide a foundation for additional research into the acoustic components in these platforms that may impact performance. A new data collection event will be initiated to explore the impact of exposure duration on cognitive modulation, in support of Air Combat Command and Air Mobility Command. - Continue conducting research to define descriptive and anticipatory analytics that derive from network and content data to inform assessment and decision making related to information maneuvers and strategies. Specific activities within this FY include developing a playbook for the Pacific theater that uses analytics to determine best information maneuvers, extending network analysis efforts that examine cross platform information campaigns, modeling that forecasts threats, and developing analytics that categorizes visual (i.e., non-text) social media content to support information campaigns and cognitive warfare. - Initiate experimentation and modeling efforts to examine the underlying psychological mechanisms of influence, and test methods to build resilience. Specific activities within this FY include the conduct of studies of the impact of multi-modal deepfakes on perception, decision-making, and behavior. - Initiate research to support the development of digital models to examine different social dynamics and features that impact individual and group cognition. Specific activities within this FY include tailoring models of the continued influence effect for individual and population models (e.g., information resonance, sentiment) for the mission simulator environment. - Continue research on computational and mathematical frameworks representing human performance across scales of analysis, components of cognition and performance, and levels of resolution for digital engineering applications. This effort moved from the Cognitive Modeling thrust. Specific activities within this FY include developing new models to test the model fidelity required to recreate Airman decision-making performance when exposed to operational stressors, where baseline capabilities may be modified by perceptual and cognitive 'noise' in the system, in support of military operations in extreme environments including long-duration flights. - Continue computational modeling capability for situational understanding through natural language interaction, information extraction, and information seeking in a laboratory context. This effort moved from the Cognitive Modeling thrust. Specific activities within this FY include conducting a study pairing Airmen with a computational model of cognition, assessing communication modes, and examining the impact of a variably adaptive model on overall team performance, such as in Joint All Domain Command and Control teams. - Continue research to demonstrate autonomy-based dynamic task allocation based on operator workload, taking into account specific missions. This effort moved from the Cognitive Modeling thrust. Specific activities within this FY include using newly developed physio-cognitive models measuring operator task saturation to drive autonomous task and asset allocation algorithms for pilots controlling multiple unmanned assets.					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602202F / <i>Human Effectiveness Applied Research</i>	Project (Number/Name) 621123 / <i>Learning and Operational Readiness</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Initiate development of a suite of tools for sensemaking of the information environment, refine a forecasting tool, including improving the user interface, and conduct user analysis interviews to facilitate development of tools and capabilities that assist with sensemaking, which will be included in simulators for Intelligence analyst operations. <i>FY 2025 to FY 2026 Increase/Decrease Statement:</i> FY 2026 increased compared to FY 2025 by \$7.129 million due to movement of Cognitive Modeling thrust activities and resources into the Digital Models of Cognition thrust, initiation of efforts to understand influence mechanisms and modeling dynamics of individual and group actions, accelerating ongoing efforts, and initiating sensemaking tool suite research and experimentation.			
Accomplishments/Planned Programs Subtotals		21.961	13.989
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
Personalized Learning thrust activities and resources are moved into the Learning and Operational Training thrust. Cognitive Modeling thrust activities and resources are moved into the Digital Models of Cognition thrust.			
D. Acquisition Strategy			
Not Applicable			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602202F / Human Effectiveness Applied Research				Project (Number/Name) 625328 / Biosciences Performance			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
625328: Biosciences Performance	0.000	26.795	47.287	33.093	0.000	33.093	-	-	-	-	-	-
A. Mission Description and Budget Item Justification												
This project conducts bioengineering and biotechnology research to optimize, safe-guard, and restore the performance of the multi-domain Airman in all environments. Research is focused in the areas of 1) Applied Cognitive Neurosciences: technologies to sustain, augment, and recover operator performance; 2) Biotechnology for Performance: research in systems biology, synthetic biology, and risk assessment; 3) Performance Sensing and Assessment: technologies to sense and forecast operator state based on physiological, molecular, and environmental signatures related to mission performance; and 4) Performance Impact of Flight: elucidate how air environments affect processes of life and the ability to maintain physiological equilibrium and develop countermeasures and technologies to sustain, enhance, and restore operator performance.												
In FY 2025 this Project 625328 changed its name from "Human Dynamics Evaluation" to "Biosciences Performance".												
B. Accomplishments/Planned Programs (\$ in Millions)										FY 2024	FY 2025	FY 2026
Title: Performance Sensing and Assessment										5.163	5.675	5.850
Description: Develop technologies to sense and forecast operator state based on physiological, molecular, and environmental signatures related to Airman performance. Develop solutions optimized for real-time, minimally-invasive, and autonomous sensing and assessing capabilities to enhance and protect Airmen across the spectrum of operational environments.												
FY 2025 Plans:												
- Continue rapid Biological Recognition Element selection and optimization strategies.												
- Continue electrochemical and Field Effect Transistors-based biomarker sensing platforms, including synthetic biology developed components.												
- Continue optimizing synthetic biology capabilities to deliver biochemical interventions.												
- Continue the identification of and optimize bio-molecular mechanisms to sense cognitive function, performance, fatigue, and stress in console operators (i.e. Intelligence, Surveillance, Reconnaissance; Cyber).												
- Continue data analytics based on sensor output to assess operator cognitive status and facilitate decision making.												
- Continue integrating sensing and intervention mechanisms to sustain and augment operator performance.												
FY 2026 Plans:												
- Continue rapid Biological Recognition Element selection and optimization strategies. Specific activities within this FY include developing methods to collect and analyze biomarkers in novel biofluids, including tears, dermal interstitial fluid and saliva, as well as volatile organic compounds in exhaled breath and the environment.												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602202F / Human Effectiveness Applied Research	Project (Number/Name) 625328 / Biosciences Performance		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Continue developing electrochemical and Field Effect Transistors-based biomarker sensing platforms, including synthetic biology developed components. Specific activities within this FY include developing, testing and optimizing sensors (including but not limited to electrochemical, field effect transistors, plasmonic, synthetic biology) for different sensing formats, including point-of-use, wearables, and environmental monitoring for aircrew during long duration missions. - Continue optimizing synthetic biology capabilities to deliver biochemical interventions. Specific activities within this FY include developing and optimizing data analytics to identify biosignatures associated with different conditions relevant to the Air Force and Space Force. - Continue the identification of and optimize bio-molecular mechanisms to sense cognitive function, performance, fatigue, and stress in console operators (i.e. Intelligence, Surveillance, Reconnaissance; and Cyber missions). Specific activities within this FY include identification and validation of new recognition elements for biomarkers of interest to support rapid sensor development. - Continue data analytics based on sensor output to assess operator cognitive status and facilitate decision making. Specific activities within this FY include developing and optimizing closed loop platforms to sense different conditions and deliver interventions as well as performing human studies to validate function of internally and externally developed sensing platforms. - Continue integrating sensing and intervention mechanisms to sustain and augment operator performance. Specific activities within this FY include designing and testing multiplexed sensor systems for simultaneous monitoring of biosignatures associated with readiness, and integrating analytics to support enhanced decision-making. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$0.175 million due to additional flight testing to develop aircrew physiologic response data sets.				
Title: Biotechnology for Performance Description: Conduct research in systems biology, synthetic biology, and physiologic risk assessment research to focus on the underlying mechanisms contributing to individual performance in various operational environments through the integration of multiple genetic and biomarker technologies. Conduct research to utilize biomarker technologies to determine the risk associated with exposure to toxic compounds and materials. Resulting research will generate biomarker candidates for sensing personalized predictors of response to stressors, and novel interventions to optimize, safeguard, and restore Airman performance. FY 2025 Plans: - Continue utilizing advanced bio-data analytics and bioinformatics processing to analyze biological mechanisms in Airmen and Guardians to develop Airman-specific predictive algorithms for physical/cognitive state, as well as personalized sustainment/ augmentation strategies utilizing advanced bio-data analytics and bioinformatics processing. Validated biomarkers will be used to generate optimal targets for sensor development for personalized state assessment enabling real-time feedback and performance optimization, as well as inform human digital engineering efforts.		5.163	5.675	5.500

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602202F / Human Effectiveness Applied Research	Project (Number/Name) 625328 / Biosciences Performance		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Continue advancement of microfluidic "organ-on-a-chip" platforms to interrogate the interactions between multi-organ systems, through simulation of the dynamic environment and physiologic conditions of tissues. Specific activities within this FY include maturation of multi-organ-on-a-chip systems to characterize neurotoxic effects of chemical and biological exposures. - Continue validation of an engineered probiotic to mitigate cognitive fatigue and enhance Airman performance. Specific activities within this FY include determining efficacy in laboratory settings, and initiating a controlled field trial. FY 2026 Plans: - Continue utilizing advanced bio-data analytics and bioinformatics processing to analyze biological mechanisms in Airmen and Guardians, leveraging baseline biomarker validation in a large-scale cohort to develop Airman-specific predictive algorithms for physical and cognitive state, as well as personalized sustainment and augmentation strategies. These biomarkers will be used to generate targets for sensor development for Airman/Guardian state assessment, enabling real-time feedback and performance optimization, as well as to inform human digital engineering efforts. Specific activities within this FY include utilizing bio-data and bioinformatics processing to analyze biological mechanisms in Airmen and Guardians in an intervention-based study examining molecular signatures of recovery; and integrating microphysiologic systems and Artificial Intelligence to deliver interventions to sustain, restore, and enhance warfighter performance in extreme operational environments. - Continue the advancement of microfluidic "organ-on-a-chip" platforms to interrogate interactions between multi-organ systems, through simulation of the dynamic environment and physiologic conditions of tissues. Specific activities within this FY include maturation of multi-organ-on-a-chip-systems for the characterization of neurotoxic effects of chemical and biological exposures. Metabolism, excretion, transport, and neuronal firing impacts will be evaluated. - Continue validation trials of an engineered probiotic designed to mitigate cognitive fatigue, and enhance airman performance. Specific activities within this FY include determining the efficacy of the engineered probiotic in laboratory settings, and initiating a controlled field trial; and continuing identification of natural beneficial probiotics through microbiome characterization. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$0.175 million due programmatic adjustments within the Science and Technology portfolio that reflects a strategic realignment.				
Title: Applied Cognitive Neurosciences Description: Develop technologies in cognitive neuroscience and physical performance to sustain, augment, and recover operator performance and determine performance attributes/metrics for optimal Airman and Guardian mission performance. Includes research focused on developing and validating physiological and behavioral assessments of current and predicted cognitive state combined with personalized cognitive performance enhancement techniques and technologies to augment operator performance. In FY 2025, this thrust changed its name from "Cognitive and Physiological Performance" to "Applied Cognitive Neurosciences".		12.906	14.521	14.521

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602202F / <i>Human Effectiveness Applied Research</i>	Project (Number/Name) 625328 / <i>Biosciences Performance</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
FY 2025 Plans: - Continue evaluating brain machine interface technology applications that enhance human machine teaming performance. - Continue developing algorithms to assess the cognitive state of the Airman via passive brain-computer interface for real-time assessment of workload, attention, and uncertainty. - Continue constructing methods to communicate these states to Artificial Intelligence-enabled technology to provide superior human-machine teaming/interaction (outcomes of decisions made by human-machine teams are optimized when the machine understands the moment-to-moment cognitive capability of their human teammate). - Continue modeling neural and physiological patterns associated with superior decision-making and evaluate neuromodulation approaches for inducing an optimal decision-making state. - Initiate evaluating the effects of neuromodulation technologies on brain activity using advanced neuroimaging techniques. - Initiate neuromodulation paradigms with new technologies (e.g. peripheral nerve stimulation, focused ultrasound stimulation, and photo-biomodulation) for cognitive enhancement across Air Force career fields (i.e., piloting; intelligence, surveillance, and reconnaissance; cyber operations; special operations). FY 2026 Plans: - Continue evaluating brain machine interface technology applications that enhance human machine teaming performance. Specific activities within this FY include constructing algorithms to accurately predict workload and fatigue state in human subjects performing flight simulator tasks. - Continue developing algorithms to assess the cognitive state of Airmen via a passive brain-computer interface for real-time assessment of workload, attention, and uncertainty. Specific activities within this FY include evaluating the efficacy of transdermal vagal nerve stimulation (tVNS) and biofeedback interventions to accelerate learning in simulated Air Force relevant training tasks such as piloting. - Continue constructing methods to communicate Airmen cognitive states to Artificial Intelligence-enabled technology to provide superior human-machine teaming/interaction (outcomes of decisions made by human-machine teams are optimized when the machine understands the moment-to-moment cognitive capability of their human teammate). Specific activities within this FY include developing neural-net based models of cognitive state predictors for integration with lab simulations to assess how well current and future weapon systems could assimilate and use Airman cognitive state information. - Continue modeling neural and physiological patterns associated with superior decision-making and evaluate neuromodulation approaches for inducing an optimal decision-making state. Specific activities within this FY include developing models of superior decision-making brain states using neuroimaging data, evaluating the effects of neuromodulation on complex, operationally relevant decision-making, and quantifying functional/structural brain changes resulting from chronic tVNS treatments paired with training using imaging technologies. - Continue evaluating the effects of neuromodulation technologies on brain activity using advanced neuroimaging techniques. Specific activities within this FY include flight testing of Commercial Off The Shelf neuro-stimulation devices to evaluate efficacy			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602202F / Human Effectiveness Applied Research	Project (Number/Name) 625328 / Biosciences Performance		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
and safety in flight crews for fatigue mitigation; expanding transition of these devices to new operational customers including Air Combat Command, missileers, and Navy operators, and conducting studies with focused ultrasound stimulation and photo-biomodulation to assess effects on sleep and wakefulness. - Continue evaluating neuromodulation paradigms with new technologies (e.g. peripheral nerve stimulation, focused ultrasound stimulation, and photo-biomodulation) for cognitive enhancement across Air Force mission sets (i.e., aircrew; intelligence, surveillance, and reconnaissance; cyber operations; special operations). Specific activities within this FY include assessing effects of COTS neuromodulation devices on sleep metrics (e.g. sleep time, sleep efficiency, time to fall asleep) FY 2025 to FY 2026 Increase/Decrease Statement: No change				
Title: Performance Impact of Flight Description: Conduct research investigating Airman performance degradation resulting from exposure to operational flight environments, and seek understanding of the fundamental mechanisms driving environmental and operational risks. Develop technologies to mitigate or eliminate the root physiologic causes of these degradations and to ultimately optimize Airman performance, resulting in the capability to fly faster, higher, and longer than adversary pilots. In FY 2025, this effort changed its name from "Performance Impact of Air and Space" to "Performance Impact of Flight". FY 2025 Plans: - Continue research for Air Force customers in areas of aircrew injury assessment/mitigation and Onboard Oxygen Generation System operational performance assessment and enhancement to eliminate dependence on aircraft environmental control system. - Continue research to characterize aircrew motion, biomechanical sensitivity to aircrew flight equipment and systems, the cause of acute and chronic back/neck pain, and musculoskeletal injuries towards the development of a Multi-Axial Neck Injury Criteria and Lumbar Injury Criteria. - Continue developing human digital engineering algorithms and models for fighter and bomber aircraft system design, and human factors analysis applications. - Initiate vetting tech solutions for clinical evaluation of musculoskeletal function and investigating of biomechanical injury mechanisms from aircraft environment. - Initiate digital transformation of data infrastructure for machine learning/Artificial Intelligence-Driven analytics, multi-modal sensing capabilities, and computational modeling.		2.581	3.216	7.222

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602202F / <i>Human Effectiveness Applied Research</i>	Project (Number/Name) 625328 / <i>Biosciences Performance</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Initiate development of Next Gen Medical Oxygen Concentrator using ion transport membrane technology to support aeromedical evacuation mission. FY 2026 Plans: - Complete research for Air Force customers in areas of aircrew injury assessment and mitigation; and Onboard Oxygen Generation System operational performance assessment and enhancement, to eliminate dependence on aircraft environmental control systems. Specific activities within this FY include finalizing test plans, executing tests, and delivering reports to Air Force customers including Air Force Life Cycle Management Center Fighters and Advanced Aircraft, Agile Combat Support, and Engineering Directorates. - Complete research to characterize aircrew motion, biomechanical sensitivity to aircrew flight equipment and systems, the cause of acute and chronic back/neck pain, and musculoskeletal injuries to facilitate development of Multi-Axial Neck Injury Criteria and Lumbar Injury Criteria. Specific activities within this FY include continuing to support operational exercises with human performance data collection and analysis expertise, to inform aircrew training and improve lab-based research operational validity. - Continue developing human digital engineering algorithms and models for fighter and bomber aircraft system design, and human factors analysis applications. Specific activities this FY include backtest models for respiratory distress, G-load loss of conscience, and workload against collected flight-test data, to define and verify an integration pathway for implementation with the Air Force Life Cycle Management Center. - Continue vetting technology solutions for clinical evaluation of musculoskeletal function, and investigating biomechanical injury mechanisms from the aircraft environment. Specific activities within this FY include demonstrating sparse sensing for Air Education and Training Command at aircrew training sites to show utility of sparse, low-cost inertial measurement systems to standardize implementation of human performance programs. - Continue digital transformation of data infrastructure for Machine Learning/Artificial Intelligence-Driven analytics, multi-modal sensing capabilities, and computational modeling. Specific activities within this FY include implementing hardware and software integration to allow for real-time synchronization and contextual overlay of simulated environmental exposures, creating Artificial Intelligence-ready data that can be used for model development and back testing. - Continue development of a Next Generation Medical Oxygen Concentrator using ion transport membrane technology by entering packaging design and early airworthiness testing to support the aeromedical evacuation mission. Specific activities this FY include post-demonstration of single cell capability, parallelizing multiple cells and packaging to meet size, weight, and power as well as O2 delivery pressure and purity requirements. - Initiate aerospace physiology research to evaluate supervisory control capacity for aircrew in cockpit simulations, quantifying the impact of operationally relevant environmental stressors during a multi-smart-UAV command scenario.			
			FY 2026

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602202F / <i>Human Effectiveness Applied Research</i>	Project (Number/Name) 625328 / <i>Biosciences Performance</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Initiate translation of algorithms and models of aircrew physiologic responses to aerospace stressors to live-flight environments for evaluation and refinement, backtest models for respiratory distress, G-load loss of conscience, and workload against collected flight-test data to define and verify an integration pathway for implementation. <i>FY 2025 to FY 2026 Increase/Decrease Statement:</i> FY 2026 increased compared to FY 2025 by \$4.006 million due to initiation of research to evaluate supervisory control capacity for autonomous collaborative platforms in operationally relevant aerospace environments, flight testing to develop aircrew physiologic response data sets, and acceleration of digital transformation efforts.			
Accomplishments/Planned Programs Subtotals		25.813	29.087
		FY 2024	FY 2025
<i>Congressional Add:</i> Program increase - project refuel		0.982	0.000
<i>FY 2024 Accomplishments:</i> Conducted Congressionally directed research.			
<i>FY 2025 Plans:</i> Not applicable.			
<i>Congressional Add:</i> Program Increase - F-35 helmet mounted display system		0.000	18.200
<i>FY 2024 Accomplishments:</i> Not applicable			
<i>FY 2025 Plans:</i> Conduct Congressionally directed efforts.			
Congressional Adds Subtotals		0.982	18.200
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
Not applicable			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602202F / Human Effectiveness Applied Research				Project (Number/Name) 625329 / Warfighter Interfaces and Teaming			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
625329: Warfighter Interfaces and Teaming	0.000	42.226	30.019	46.105	0.000	46.105	-	-	-	-	-	-
Note Note: - Warfighter Interfaces and Teaming Project 625329 Collaborative Interfaces and Teaming thrust activities and resources are moved into the Distributed Teaming and Communication thrust. Similarly Multisensory Perceptions and Communication thrust activities and resources are moved into the Distributed Teaming and Communication thrust.												
A. Mission Description and Budget Item Justification This project conducts research to achieve warfighter decision superiority across air, space, and cyber domains through research on advanced human-machine interfaces, joint-cognitive systems decision-making, and distributed and collaborative teaming and communication enhancements. Research provides advanced warfighter Command and Control interface technology, team collaboration tools, intelligent decision aids, and agile communications management. Research is conducted in two focus areas: human-machine interactions, and distributed teaming and communication. Human-machine interactions focuses on achieving decision superiority by optimizing human engagement with increasingly complex, highly automated, and Artificial Intelligence-enabled combat and combat support systems. Distributed teaming and communication focuses on research technology and methods to enhance the formation, assessment, and performance of distributed teams of warfighters as well as human-machine teams executing combat. Human Machine Teaming technology is critical to optimally integrating Airmen and Guardians with the increasingly technological & networked battlespace to achieve and maintain resilient decision superiority and defeat adversaries. In FY 2025 this Project 625329 changed name from "Sensory Evaluation and Decision Science to "Warfighter Interfaces and Teaming".												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2024	FY 2025	FY 2026	
Title: Collaborative Interfaces and Teaming									11.401	4.286	0.000	
Description: Research new Human-Machine Teaming technologies and concepts (e.g., information portrayal, control devices, decision aiding algorithms and adaptive agents) for effective human-machine interaction and teamwork.												
FY 2025 Plans: - Complete research effort on team resilience; build upon foundation of novel teaming metrics research to develop prototype team health scanner tool. -Continue research on transparency for distributed teams; build upon Joint All Domain Command and Control playbook research to develop prototype support tools for multi-domain teaming. - Continue research on human autonomy collaboration tools to enhance resiliency. - Continue the exploration of test methods for achieving bi-directional transparency in human-machine teaming.												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602202F / <i>Human Effectiveness Applied Research</i>	Project (Number/Name) 625329 / <i>Warfighter Interfaces and Teaming</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Complete transfer of authority research to facilitate rapid acquisition of situation awareness for unexpected custody of assets. - Continue research methodologies to conduct operator-centric field evaluations of fielded automation/autonomy systems. Experiment with interface technologies for control of unmanned assets from aerial platforms. - Continue to refine guidelines for engendering trust and/or suspicion in human-human and human-machine teams. FY 2026 Plans: - Move "research on transparency for distributed teams; build upon Joint All Domain Command and Control playbook research to develop prototype support tools for multi-domain teaming" plans to the Distributed Teaming and Communication thrust. - Move "research on human autonomy collaboration tools to enhance resiliency" plans to the Distributed Teaming and Communication thrust. - Move "exploration of test methods for achieving bi-directional transparency in human-machine teaming" plans to the Distributed Teaming and Communication thrust. - Move "research methodologies to conduct operator-centric field evaluations of fielded automation/autonomy systems" plans to the Distributed Teaming and Communication thrust. - Move "experiment with interface technologies for control of unmanned assets from aerial platforms" plans to the Distributed Teaming and Communication thrust. - Move "refine guidelines for engendering trust and/or suspicion in human-human and human-machine teams" plans to the Distributed Teaming and Communication thrust. The Collaborative Interfaces and Teaming thrust will be completed in FY25. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$4.286 million due to moving Collaborative Interfaces and Teaming thrust activities and resources into the Distributed Teaming and Communication thrust.			
Title: Multisensory Perceptions and Communication Description: Multisensory Perception and Communication focuses on identifying and exploiting the underlying sensory and cognitive mechanisms mediating human perception and communication in order to inform the development of multimodal interfaces and speech/language technologies. Research examines sensory processing, multisensory integration, and human communication processes in simple and complex environments to identify the barriers to effective information transmission and inform the development of technologies to overcome, or exploit, those barriers in order to enhance Airmen performance. FY 2025 Plans: - Complete behavioral research on issues associated with disrupted and degraded communication channels. - Continue natural ad hoc team coordination in emergency response and Joint-All Domain scenarios.		16.046	8.584
			0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602202F / <i>Human Effectiveness Applied Research</i>	Project (Number/Name) 625329 / <i>Warfighter Interfaces and Teaming</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Continue the collection of communication data from live and simulated events in these domains, and use data to develop new models of natural human communication processes. - Complete operationally-relevant speech databases and dialogue processes. - Continue the development of new tools for integrating situation awareness displays with language based communication systems, and evaluate these capabilities in laboratory studies and operationally-relevant testbeds. FY 2026 Plans: - Move "natural ad hoc team coordination in emergency response and Joint-All Domain scenarios" plans to the Distributed Teaming and Communication thrust. - Move "collection of communication data from live and simulated events in these domains, and use data to develop new models of natural human communication processes" plans to the Distributed Teaming and Communication thrust. - Move "development of new tools for integrating situation awareness displays with language based communication systems, and evaluate these capabilities in laboratory studies and operationally-relevant testbeds" plans to the Distributed Teaming and Communication thrust. The Multisensory Perception and Communication thrust will be completed in FY25. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$8.584 million due to moving Multisensory Perception and Communication activities and resources into the Distributed Teaming and Communication thrust.			
Title: Human Machine Interactions Description: Research to identify principles of human interaction with highly complex systems, including advanced automation and increasingly intelligent Artificial Intelligence-enabled machines. The goal of this research is to achieve and sustain decision superiority across complex and uncertain mission environments. Research areas include identifying, characterizing, and overcoming key challenges to warfighter interactions with complex and intelligent systems, situationally adaptive interface design and usability, knowledge representation across sensory modalities, system observability and transparency, directability, joint-cognitive decision making, and maintaining properly calibrated trust across changing combat or contingency conditions. FY 2025 Plans: - Initiate research on human-centric interfaces and interaction strategies for improved Artificial Intelligence/automation transparency across different mission applications and Artificial Intelligence methods (including generative Artificial Intelligence approaches). - Initiate research into strategies that optimize closed-loop system adaptations to current operator functional state (i.e., workload) for maximally performing human-machine teams.		0.000	11.250

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602202F / <i>Human Effectiveness Applied Research</i>	Project (Number/Name) 625329 / <i>Warfighter Interfaces and Teaming</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Initiate research on advanced visualization techniques to enable warfighters to rapidly extract meaning from complex, uncertain, multi-dimensional data sources. FY 2026 Plans: - Continue research on human-centric interfaces and interaction strategies for improved Artificial Intelligence (AI)/automation transparency across different mission applications and AI methods (including generative AI approaches). Specific activities within this FY include designing and testing human-centered approaches for effective human-machine interaction with in-house large language models in warfighting applications; finalizing results from in-person data collection with military subject matter experts on non-image data classification; implementing a study for transparent Intelligence, Surveillance, and Reconnaissance mission route-planning; and analyzing and presenting results. - Continue research into strategies that optimize closed-loop system adaptations to current operator functional state (i.e., workload) for maximally performing human-machine teams. Specific activities within this FY include in-person and online data collection using high-fidelity Intelligence, Surveillance, and Reconnaissance (ISR) mission tasks; exploring and quantifying additional human-automation task domains of significant military interest; and refining and validating specific task interface augmentation strategies for specific mission sets. - Continue research on advanced battlespace visualization techniques to enable warfighters to rapidly extract meaning from complex, uncertain, multi-dimensional data sources. Specific activities within this FY include applying visualization knowledge lessons learned to new warfighting domains (space), continued support to ISR analytics user interface development, and accelerating research for current high priority Department of the Air Force systems. - Initiate research on continuous planning techniques, tradecraft, and interface tools that streamline and strengthen multi-player, AI-enabled plans development, and assessment. Specific activities within this FY include multiple in-person research efforts to identify planning capability gaps through workflow analytic techniques, assessing human-machine dynamic planning execution enhancements for warfighting tasks using decision-support systems, and enhancing continuous mission planning operational tempo via human-machine teaming tools. - Initiate identification of interface implications of cognitive warfare; tools for improved situation awareness of cognitive warfare threats, better decision-making, and intelligently deploying & directing cognitive warfare related effects. Specific activities within this FY include conducting cognitive task analyses on information warfare operators for data that will be used for technology development, confirming human machine interface requirement gaps for Command and Control for the Information Environment Program and related information warfare tools, and generating initial interface concepts to support cognitive warfare decision making. - Initiate research on next-generation interfaces for tactically managing next-generation platforms with an emphasis on interface standardization across platforms and missions. Specific activities within this FY include pursuing Command Guidance (COG) symbology evaluation selection as a Test Pilot School Test Management Project, completing baseline Large Area Display tactical			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602202F / <i>Human Effectiveness Applied Research</i>	Project (Number/Name) 625329 / <i>Warfighter Interfaces and Teaming</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
Pilot/Vehicle Interface (PVI) for Spatial Disorientation Mitigation flight test, completing aircrew helmet technology laboratory experimentation, and completing Air Receiver Decision Aiding System (ARDAS) initial in-flight evaluation. <i>FY 2025 to FY 2026 Increase/Decrease Statement:</i> FY 2026 increased compared to FY 2025 by \$5.625 million due to the initiation of research to harness artificial intelligence progresses enabling team planning and plans assessment, initiation of research on interface implications of cognitive warfare threats and opportunities in command and control and initiating research on standardizing interfaces across platforms and missions with autonomous systems.			
<i>Title:</i> Distributed Teaming and Communication <i>Description:</i> Research that explores the rapid formation, real-time assessment, and dynamically optimized performance of distributed heterogeneous teams of warfighters as well as human-machine teams to enable rapid, agile and robust mission operations. Research areas include methods to enable the rapid formation of mission-effective heterogeneous teams, dynamic monitoring/assessment of team performance through optimal assemblage of novel and existing metrics, adaptive tactics for recovery from real or predicted team performance degradations, and novel distributed communication and collaboration tools, technologies and management methods that are responsive to variable network environments. Note: FY2026 increased by \$27.617 million compared to FY2025 due to moving Collaborative Interfaces and Teaming, and Multisensory Perception and Communication thrusts' activities and resources into the Distributed Teaming and Communication thrust; expanding and accelerating human factors and performance research related to utilization of Artificial Intelligence and Airman/Guardian physiological data to facilitate All Domain Command and Control during complex peer-level combat operations; and initiating research on novel nonintrusive metrics and models to assess distributed team performance, research on adaptive communication management interfaces, research on enhanced conversational artificial intelligence for team performance enhancement, research for developing Intelligent Agent Teammate/Advisors technology, and research to identify and understand critical teaming factors for non-collated teams while engaging the enemy. <i>FY 2025 Plans:</i> - Initiate research into natural language processing methods to improve teamwork assessments and mitigations. - Initiate research on distributed teaming: characteristics, influences, challenges, and collaborative solutions to maximize team situation awareness and dynamic task management. - Initiate research on how best to integrate multi-domain information for rapid warfighter assessment and action in Joint All Domain Command and Control. <i>FY 2026 Plans:</i>		0.000	7.238
			34.855

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602202F / <i>Human Effectiveness Applied Research</i>	Project (Number/Name) 625329 / <i>Warfighter Interfaces and Teaming</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Initiate research and development of novel, nonintrusive metrics, and models to dynamically assess distributed Intelligence, Surveillance, and Reconnaissance (ISR), and Air Battle Management teams performance and behavior. Specific activities within this FY include joint data analysis and metrics development resulting in a joint report with collaborators from the Army. - Continue research into natural language processing methods to improve teamwork assessments and mitigations. Specific activities within this FY include integration of a natural language processing pipeline, and the integration of an Artificial Intelligence (AI) ISR mission summary generator. - Initiate research on adaptive communication management interfaces that enable resilient multi-mixed teams in Joint All Domain Command and Control (JADC2) operations. Specific activities within this FY include execution of a human-in-the-loop study evaluating the system's ability to effectively manage team communications, recognize discrepancies, and apply mitigation techniques via novel interfaces techniques. - Continue research on distributed teaming: characteristics, influences, challenges, and collaborative solutions to maximize team situation awareness and dynamic task management. Specific activities within this FY include a joint experiment with United States Air Force Academy examining the influence of an AI teamwork support tool on decision making in a distributed, multi-team system. - Initiate research on enhanced conversational AI to optimize human-automation teaming and enable high-bandwidth interaction with intelligent agents that are like humans. Specific activities within this FY include the integration of a customizable dialogue system with validated synthetic voice generation to develop a robust text-to-speech system capable of adapting to user preferences and communication style. - Continue research on how best to integrate multi-domain information for rapid warfighter assessment and action in JADC2. Specific activities within this FY include the refinement and further validation of a suite of interfaces designed to support a non-kinetic duty officer in managing the execution and real time replanning of space and cyber Courses of Action (COAs). - Continue research on transparency for distributed teams; build upon JADC2 playbook research to develop prototype support tools for multi-domain teaming. This research is moved from the Collaborative Interfaces and Teaming thrust. Specific activities within this FY include integration of specific warfighter task language into research systems to enable the human-machine conversations required for JADC2 playbook operation as well as COA generation. - Continue research on human autonomy collaboration tools to enhance resiliency. This is moved from the Collaborative Interfaces and Teaming thrust. Specific activities within this FY include execution of a human-in-the-loop study evaluating the system's ability to effectively manage team communications, recognize discrepancies, and apply mitigation techniques via novel interfaces techniques for ISR and Air Battle Management missions. - Continue the exploration of test methods for achieving bi-directional transparency in human-machine teaming. This is moved from the Collaborative Interfaces and Teaming thrust. Specific activities within this FY include the integration of advanced human language technologies with novel Joint All Domain Command and Control (JADC2) interfaces such that distributed teammates can query the system (using multiple methodologies) regarding task interdependencies and COA comparison parameters.			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602202F / <i>Human Effectiveness Applied Research</i>	Project (Number/Name) 625329 / <i>Warfighter Interfaces and Teaming</i>
B. Accomplishments/Planned Programs (\$ in Millions)		
- Continue refining guidelines for engendering trust and/or suspicion in human-human and human-machine teams. This is moved from the Collaborative Interfaces and Teaming thrust. Specific activities within this FY include preparing a report of findings from the third planned study in a series examining the spread of trust and distrust of a machine agent in a multi-agent, multi-team constellation in a command and control environment. - Continue natural ad hoc team coordination in emergency response and Joint-All Domain scenarios. This is moved from the Multisensory Perceptions and Communication thrust. Specific activities within this FY include the continued refinement and testing of a high-fidelity interactive timeline display by which distributed teammates can quickly and accurately determine who is responsible for a task, when that task needs to occur, the status of that task, and any interdependencies between that task and another teammates task. - Continue collection of communication data from live and simulated events in these domains and use data to develop new models of natural human communication processes. This is moved from the Multisensory Perceptions and Communication thrust. Specific activities within this FY include execution of an experiment investigating the impact of denied/degraded comms on teamwork, and methods to enhance team resynchronization. - Continue development of new tools for integrating situation awareness displays with language-based communication systems and evaluate these capabilities in laboratory studies and operationally relevant testbeds. This is moved from the Multisensory Perceptions and Communication thrust. Specific activities within this FY include the integration of advanced human language technologies with novel JADC2 interfaces such that distributed teammates can query the system (using multiple methodologies) regarding task interdependencies and Course Of Action comparison parameters. - Initiate development of Intelligent Agent Teammate/Advisor by adapting cutting edge artificial intelligence techniques to military uses with a focus on human-machine teaming, leveraging all available technology for processing multimodal inputs and outputs {speech, text, image, video} to begin to build and test Adaptive Teammate technology that utilizes real-time operator feedback to customize Human-Machine interaction with the intelligent agent. - Initiate design of interface concepts to identify and understand critical teaming factors required for non-collocated teams to successfully coordinate and engage the enemy while operating in contested and/or denied settings, analyze task management techniques that support rapid alerting and replanning as well as develop resynchronization tools that aid in the establishment of a "common operating picture"/common understanding across teammates after a loss of communications.		
FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$27.617 million due to moving Collaborative Interfaces and Teaming, and Multisensory Perception and Communication thrusts' activities and resources into the Distributed Teaming and Communication thrust; expanding and accelerating human factors and performance research related to utilization of Artificial Intelligence and Airman/Guardian physiological data to facilitate All Domain Command and Control during complex peer-level combat operations; and initiating research on novel nonintrusive metrics and models to assess distributed team performance, research on adaptive communication management interfaces, research on enhanced conversational artificial intelligence for team performance		

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602202F / <i>Human Effectiveness Applied Research</i>	Project (Number/Name) 625329 / <i>Warfighter Interfaces and Teaming</i>		
B. Accomplishments/Planned Programs (\$ in Millions) enhancement, research for developing Intelligent Agent Teammate/Advisors technology, and research to identify and understand critical teaming factors for non-collated teams while engaging the enemy.		FY 2024	FY 2025	FY 2026
Title: System Analytics Description: System Analytics studies the macro-cognition of the Airman using computational tools to accomplish mission objectives, encompassing interactions between operators, analytics, and environment. The goal of this research area is to describe, assess, and design for effective integration of analytics into mission systems. FY 2025 Plans: - Complete the assessing design systems and methods to effectively blend data analytics with human cognition, with the goal of enhancing Airman decision-making and improving joint cognitive systems performance in the face of massive volumes of complex and fast-changing information. - Complete assessing and enhancing the impact of analytics on thinking and reasoning in order to tailor capabilities to the context-specific cognitive requirements of our Warfighters. - Complete sensemaking studies, improve situational awareness, and mitigate data overload in order to enable Warfighters to rapidly extract meaning from complex, uncertain, and multi-dimensional data sources. Specific work is being vectored to directly support Joint All-Domain Command and Control, with attention to experiments, studies, guidelines, and publications in high-priority and related strategic investment areas. FY 2026 Plans: There are no planned FY 2026 activities for the Systems Analytics thrust. The thrust will complete all planned activities by end of FY 2025. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$4.286 million due to completion of all planned activities by end of FY 2025.		14.779	4.286	0.000
Accomplishments/Planned Programs Subtotals		42.226	30.019	46.105
C. Other Program Funding Summary (\$ in Millions) N/A Remarks Collaborative Interfaces and Teaming thrust activities and resources, and Multisensory Perceptions and Communication thrust activities and resources are moved into the Distributed Teaming and Communication thrust.				
D. Acquisition Strategy Not applicable				

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602202F / Human Effectiveness Applied Research				Project (Number/Name) 627757 / Bioeffects			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
627757: Bioeffects	0.000	46.925	46.130	33.438	0.000	33.438	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This project conducts applied research on the effects of human exposure to electromagnetic energy (direct current to radio frequency to optical, scalable directed energy weapons, and other novel weapons). The project conducts laboratory experiments to provide fundamental knowledge of mechanisms of interaction of directed energy with molecules, cells, tissues, organs, and whole organisms in support of military directed energy systems. This research addresses mechanisms of interactions through fundamental physical principles, biological responses, and physiological outcomes. Research focus areas include novel directed energy bioeffects and mechanisms and directed energy modeling, simulation, and analysis. This research enhances combat survivability and systems effectiveness through technologies that enable deployed forces to counter optical threats and exploit optical systems for offensive applications. In addition, basic biological investigations into the mechanisms associated with high peak power and high average power radio frequency exposure allow for the exploitation of directed energy systems for offensive capabilities while protecting the warfighter from adversarial use of radio frequency technologies. Novel directed energy bioeffects mechanisms research examines the physical, physiological, behavioral, and neural interactions of electromagnetic energy with tissues to understand dose-response effects as well as reveal the means to cause or prevent a specific effect. This work assures valid assessments of real-world concerns and manages the risks associated with technological surprise. The project includes laboratory experiments to understand the mechanistic and behavioral effects of novel weapon incidents to Airmen and Guardians and to understand the effects of protection strategies on Airman and Guardian performance. Directed energy modeling, simulation, and analysis research focuses on new software components that represent and optimize concepts of novel system employment from the Airman and Guardian standpoint. These components are matured for future transition and application for engagement-to-mission level simulations in which directed energy weapons are employed.

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

	FY 2024	FY 2025	FY 2026
Title: Novel Directed Energy Bioeffects and Mechanisms	16.424	16.154	9.247
Description: Conducts laboratory experiments to provide fundamental knowledge of mechanisms of interaction of directed energy with molecules, cells, tissues, organs, and whole organisms in support of military directed energy systems. Conducts laboratory experiments to understand the mechanistic and behavioral effects of novel weapon incidents to the Airman and to understand the effects of protection strategies on Airman performance.			
FY 2025 Plans: - Continue collection and transition of data from multiple parameterization, validation and verification experimental studies to support modeling simulation and analysis of high peak power microwave, high energy laser, and other emerging novel weapon concepts. This work assures valid assessments of real-world concerns and manages the risks associated with technological surprise. - Continue studies to further the understanding of dynamic tissue characteristics and cellular and subcellular response mechanisms following electromagnetic energy exposure. - Continue prior-year studies on near-to-mid infrared parameters to fill data gaps required for materiel selection of laser systems.			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602202F / Human Effectiveness Applied Research		Project (Number/Name) 627757 / Bioeffects	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
- Continue developing methodologies to understand vulnerabilities and vision effects, including impact of protective devices on color vision. Tasks will also provide representation of laser vision impacts in virtual and augmented reality platforms to familiarize the warfighter with those effects. - Continue research that underpins enhanced assessment of operational exposures to battlefield directed energy environments to include counter directed energy weapon technology. - Continue to expand research data sets that further the development of directed energy policy and exposure standards to maximize interoperability and safe use of technology. - Continue to accelerate biological and behavioral investigations of novel waveforms to mitigate technological surprise. Explore relevant mechanisms, dosimetry and diagnostic methodologies, and inform treatment options. Expand upon and validate damage from potential threat systems using advanced imaging technique and systems. - Continue supercontinuum parameterization in the near infrared region to address identified technical gaps and damage thresholds for safety standards. -Initiate assessment of non-linear optical damage from emerging laser threats. FY 2026 Plans: - Continue collection and transition of data from multiple parameterization, validation and verification experimental studies to support modeling simulation and analysis of high peak power microwave, high energy laser, and other emerging novel weapon concepts. Specific activities within this FY include maturing instrumentation design enabling the evaluation of pulsed electric field effect bioeffects in cellular and molecular preparations, and beginning experimental proof of concept with in-vitro models relevant to radio frequency bioeffects research applications. - Continue studies to further the understanding of dynamic tissue characteristics and cellular and subcellular response mechanisms following electromagnetic energy exposure. Specific activities within this FY include completing a study on deep tissue burn injuries generated by penetrating microwave exposures, providing laboratory level validation of outcomes, and handoff to subsequent transitioned risk-of-injury predictive models, enabling directed energy review processes mandated for the Department of Defense. - Continue prior-year studies on near-to-mid infrared parameters to fill data gaps required for materiel selection of laser systems. Specific activities within this FY include experiments to parameterize injury thresholds and optimize the operational envelope of pulsed laser systems used in active electro-optic infrared sensors, and characterizing the bioeffects of high energy pulsed lasers, aligned to service technology development and employment as directed energy weapons. - Continue developing methodologies to understand vulnerabilities and vision effects, including the impact of protective devices on color vision. Also represent laser vision impacts in virtual and augmented reality platforms to familiarize the warfighter with those effects. Specific activities within this FY include creation of datasets for the validation of computer models through human-use experimentation designed to parameterize objective measures of human vision effects and mission performance impact.					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602202F / Human Effectiveness Applied Research	Project (Number/Name) 627757 / Bioeffects		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Continue research that underpins enhanced assessment of operational exposures to battlefield directed energy environments to include counter directed energy weapon technology. Specific activities within this FY include delivering data to update Department of Defense and North Atlantic Treaty Organization directed energy safety standards for radio frequency and laser exposures. Efforts also include accurately representing transient and permanent effects of eye injuries from threats along with protective equipment impacts to understand performance implications through human subject experiments using virtual reality simulation technologies. - Continue to develop research data sets that inform the development of directed energy policy and exposure standards to maximize interoperability and safe use of Directed Energy (DE) technology. Specific activities within this FY include collection of bioeffects data to parameterize the severity of injury outcomes applicable to near and mid-term DE technology development. - Continue biological and behavioral investigations of novel waveforms to mitigate technological surprise. Explore relevant mechanisms and dosimetry, and validate damage from potential threat systems using advanced imaging techniques and systems. Specific activities within this FY include maturing a novel directed energy and synergistic response hypothesis, completing the pilot phase of experimental proofs of concept for in-vivo models, and transfer technology to Air Force and Space Force medical personnel, and counter-directed energy weapons technology development teams. - Continue assessment of non-linear optical damage from emerging laser threats. Specific activities include an experimental campaign to parameterize regions where current exposure limits do not protect warfighters from injury. - Initiate the laboratory validation maturity phase of novel radio frequency bioeffects at in-vivo levels, relevant to counter-electronic and potential threats, provide data for the validation of advanced predictive physics-level models for dosimetry and physiological outcomes, as well as systematic in-vivo experimentation which parameterizes effect responses aligned to parameter spaces deemed highest priority through intelligence sources and the directed energy science and technology enterprise. - Initiate a laboratory level validation and parameterization study of near-infrared, high energy, short pulse laser bioeffects supporting injury scaling aligned to tactical mission applications of directed energy weapons, using pulsed laser approaches in mid-term timeframe, parameterize injury thresholds and supra-threshold injury severity, along with augmenting physics-level models, and validate laser parameters with the directed energy community across the Department of Defense. - Initiate the design phase for improved retinal imaging instrumentation for laser bioeffects research, with objective experimental design proof of concept by the end of FY 26, improving speed and fidelity of laser eye damage studies characterizing outcomes which quantify severity of injury, including engineering design evaluation, and initial fabrication of a laboratory-demonstration system for use in FY27 experiments. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$6.907 million due to completion of experiments associated with specific inter-agency health concerns.				
Title: Directed Energy Bioeffects Modeling, Simulation and Analysis		30.501	29.976	24.191

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602202F / <i>Human Effectiveness Applied Research</i>	Project (Number/Name) 627757 / <i>Bioeffects</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
Description: Conducts physics-level modeling and simulations to represent and optimize directed energy bioeffects to include direct, scalable, and collateral effects. FY 2025 Plans: - Continue advancing dose-response models to address data parameter gaps and to incorporate severity of injury as part of employment risk as a function of directed energy weapon parameters. - Continue advancing three-dimensional digital anatomical models, increasing resolution, dynamic properties, and adapting for use within advancing physics-level. - Continue maturing approaches for utilizing high performance computing to quantify the uncertainty within multi-physics bioeffect simulations of directed energy in end-to-end simulations at the engineering, engagement, and mission levels, incorporating models from other collaborative organizations. - Continue extending modeling approaches for surrogating physics-level simulations through machine learning approaches, and suitable for integration for digital representation of human throughout analyses. - Continue virtual reality component development for vision effects (glare/dazzle) for transition into 6.3 program. - Initiate dose-response library updates based on most recent scientific data parameterizing responses from emerging systems and severity of injury. FY 2026 Plans: - Complete the Virtual Reality component for vision effects (glare/dazzle) through transition of laser dazzle simulations into operational applications. Specific activities within this FY include the delivery of computer model components suitable for integration into experimental wargames, demonstrations of threat and protection solution effects to warfighters, and integration in products of the training and simulation community. - Continue advancing dose-response models to address data parameter gaps and to incorporate severity of injury as part of employment risk as a function of directed energy weapon parameters. Specific activities within this FY include delivery of validated computer model software components suitable for direct integration in existing analysis and weaponeering products. - Continue advancing three-dimensional digital anatomical models, increasing resolution, dynamic properties, and adapting for use within advancing physics-level simulations. Specific activities within this FY include the incorporation of adaptive meshing of small tissue structures which optimize computational speed, while retaining the ability to efficiently evaluate open questions regarding damage in anatomical regions of interest, and through both heat and stress wave mechanisms. - Continue maturing approaches for utilizing high performance computing to quantify the uncertainty within multi-physics bioeffect simulations of directed energy in end-to-end simulations at the engineering, engagement, and mission levels, incorporating models from other collaborative organizations. Specific activities within this FY include initial integration of highest priority capabilities, including directed energy injury and vision effect endpoints, into current Department of Defense high-performance			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602202F / <i>Human Effectiveness Applied Research</i>	Project (Number/Name) 627757 / <i>Bioeffects</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
computing tool suites and architectures, and demonstration of the quantification of uncertainty when larger engagement scenarios include combined system performance and biological outcomes. - Continue extending modeling approaches for surrogating physics-level simulations through machine learning approaches suitable for integration for digital representation of human throughout analyses. Specific activities within this FY include advancements using physics-informed machine learning approaches, with a direct comparison to outcomes of Scalable Effects Simulation Environment physics codes, and completing an evaluation of the suitability of this technical approach. - Initiate dose-response library updates based on scientific data parameterizing responses from emerging directed energy systems and severity of skin injury, updating computational component libraries for integration into analysis products and weaponizing tools within the next two years. <i>FY 2025 to FY 2026 Increase/Decrease Statement:</i> FY 2026 decreased compared to FY 2025 by \$5.785 million due to decreased emphasis on bioeffects modeling and simulation for specific inter-agency health concerns.			
Accomplishments/Planned Programs Subtotals		46.925	46.130
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
Not applicable			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force **Date:** June 2025

Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research	R-1 Program Element (Number/Name) PE 0602203F I Aerospace Systems Technologies

COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
Total Program Element	0.000	233.413	333.320	321.059	0.000	321.059	-	-	-	-	-	-
622401: Structures	0.000	0.000	76.135	74.989	0.000	74.989	-	-	-	-	-	-
622403: Flight Controls and Pilot-Vehicle Interface	0.000	0.000	42.659	76.072	0.000	76.072	-	-	-	-	-	-
622405: High Speed Systems Technology	0.000	0.000	41.137	55.234	0.000	55.234	-	-	-	-	-	-
623012: Advanced Propulsion Technology	0.000	31.331	21.430	0.000	0.000	0.000	-	-	-	-	-	-
623048: Combustion and Mechanical Systems	0.000	4.845	0.000	0.000	0.000	0.000	-	-	-	-	-	-
623066: Turbine Engine Technology	0.000	81.080	70.931	71.804	0.000	71.804	-	-	-	-	-	-
623145: Aerospace Power Technology	0.000	70.537	38.640	0.000	0.000	0.000	-	-	-	-	-	-
625171: Missile Rocket Propulsion	0.000	37.095	36.945	34.426	0.000	34.426	-	-	-	-	-	-
625330: Aerospace Fuel Technology	0.000	8.525	5.443	8.534	0.000	8.534	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

In FY 2026, the RDT&E Budget Activity 02 (BA02) 0602203F Aerospace Propulsion program is renamed Aerospace Systems Technologies program.

Aerospace Systems Technologies program includes Applied Research funds for contracts, in-house efforts, civilian pay, travel, and infrastructure support costs for the Air Force Research Laboratory (AFRL) Aerospace Systems Directorate (RQ) located at Wright-Patterson AFB, Ohio, Edwards AFB, CA, and Arnold AFB, TN.

Aerospace Systems investigates, develops, and analyzes aerospace system technologies for military applications that remove operational limitations while advancing warfighter capabilities critical to the future threat. Technologies being developed include Aerodynamics and Structures Technology, Aerospace Power & Flight Control Technology, High Speed Systems, Advanced Propulsion, Turbine Engine, Aerospace Power, Rocket Propulsion, and Aerospace Fuels. These technologies enable Autonomous Collaborative Platforms, High Speed Weapons and Platforms, and Rapidly Produced and Upgraded Platforms.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research	R-1 Program Element (Number/Name) PE 0602203F I Aerospace Systems Technologies	
This program investigates, develops, and analyzes aerospace system technologies for military applications that remove operational limitations and advance warfighter capabilities critical to the future threat. The specific areas of applied research are in: -Aerodynamics and Structures Technology: Develops and exploits advanced aerodynamic vehicle configurations, new materials, fabrication processes, design techniques, and incorporates vehicle, inter-vehicle, and intra-vehicle control systems enabling advanced capabilities for the Air Force. -Aerospace Power & Flight Control Technology: Develops technologies that enable maximum affordable capability focusing on manned and autonomous collaborative platforms for military applications that remove operational limitations and enable advanced vehicle designs and mission systems. -High-Speed Systems Technology: Design and develop cutting-edge technologies for high-speed and hypersonic aerospace systems, including advanced high-temperature structures and innovative aerodynamic vehicle designs. These advancements will enable the creation of next-generation high-speed weapons, surveillance and reconnaissance platforms, and multi-domain vehicles. Furthermore, high-speed aerospace vehicles, including hypersonic capabilities, and high-speed air-breathing propulsion systems will be developed, enabling revolutionary capabilities to counter near-peer competitors. -Advanced Propulsion Technology: Note: In FY2026 this effort is transferred to High-Speed Systems Technology. Develops high-speed (to include hypersonic) aerospace vehicles as well as high-speed air breathing propulsion enabling revolutionary capabilities for near peer-to-peer competition. -Combustion and Mechanical Systems: Evaluates lubricants, for advanced turbine engines, and combined cycle engines with emphasis on low cost and high-speed applications. -Turbine Engine Technology: Develops engine technology to address military specific needs for manned systems, autonomous collaborative platforms, and munition applications in various class sizes. -Aerospace Power Technology: Note: In FY2026 this effort is transferred to Aerospace Power & Flight Control Technology. Develops electrical and thermal control technologies for military applications that remove operational limitations enabling advanced vehicle designs and high-power mission systems. - Rocket Propulsion Technologies: Develops rocket propulsion technologies for the design, development, and fabrication of strategic systems and tactical missiles enabling timely and affordable capacity. -Aerospace Fuel Technology: Evaluates fuels and related technologies to enable increased performance and affordability of high-speed and munition capabilities. In FY 2025, the RDT&E Budget Activity 02 (BA02) Aerospace Vehicles Technologies efforts and activities under PE 0602201F, were transferred to PE 0602203F, Aerospace Propulsion for increased integration between airframe, flight control, propulsion, electrical, power and thermal management.		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research</i>		R-1 Program Element (Number/Name) PE 0602203F / <i>Aerospace Systems Technologies</i>
In FY 2025, the entirety of PE 0602201F, Aerospace Vehicle Technologies, Project 622401 Structures, was transferred to PE 0602203F, Aerospace Propulsion, Project 622401 Structures. In FY 2025, the entirety of PE 0602201F, Aerospace Vehicle Technologies, Project 622404, Aeromechanics, was transferred to PE 0602203F, Aerospace Propulsion, Project 622401 Structures. In FY 2025, the entirety of PE 0602201F, Aerospace Vehicle Technologies, Project 622403, Flight Controls and Pilot-Vehicle Interface, was transferred to PE 0602203F, Aerospace Propulsion, Project 622403 Flight Controls and Pilot-Vehicle Interface. In FY 2025, the entirety of PE 0602201F, Aerospace Vehicle Technologies, Project 622405, High Speed Systems Technology, was transferred to PE 0602203F, Aerospace Propulsion, Project 622405 High Speed Systems Technology. Efforts in this program have been coordinated through the Department of Defense (DoD) Science and Technology (S&T) Executive Committee process to harmonize efforts and eliminate duplication. This program element may include necessary civilian pay expenses required to manage, execute, and deliver science & technology capabilities. In FY 2026, \$122.064 million is budgeted in this program for 616 Civilian Full- Time Equivalents (FTEs). The use of program funds in this program element would be in addition to the civilian pay expenses budgeted in program elements 0601102F, 0602020F, 0602102F, 0602202F, 0602204F, 0602336F, 0602602F, 0602605F, 0602788F, 0602298F, 0603680F, 1206601SF and 1206616SF. This program element may include necessary expenses to support the operation and maintenance of facilities to manage, execute, and deliver S&T capabilities. Funds in this program element may be used to investigate specified technology advancements in multiple domains. The FY 2026 request was reduced by \$1.238 million for Advisory and Assistance Services to promote efficiencies and advance the policies of the Administration in alignment with Executive Order 14222, "Implementing the President's Department of Government Efficiency Cost Efficiency Initiative." The FY 2026 request was reduced by \$13.547 million for civilian personnel to optimize the workforce in compliance with Executive Order 14210, "Implementing the President's Department of Government Efficiency Workforce Optimization Initiative." This program is in Budget Activity 2, Applied Research because this budget activity includes studies, investigations, and non-system specific technology efforts directed toward general military needs with a view toward developing and evaluating the feasibility and practicality of proposed solutions and determining their parameters.		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force				Date: June 2025		
Appropriation/Budget Activity		R-1 Program Element (Number/Name)				
3600: Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research		PE 0602203F I Aerospace Systems Technologies				
B. Program Change Summary (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Previous President's Budget		184.867	339.477	349.289	0.000	349.289
Current President's Budget		233.413	333.320	321.059	0.000	321.059
Total Adjustments		48.546	-6.157	-28.230	0.000	-28.230
• Congressional General Reductions		0.000	0.000			
• Congressional Directed Reductions		0.000	-9.157			
• Congressional Rescissions		0.000	0.000			
• Congressional Adds		62.000	3.000			
• Congressional Directed Transfers		0.000	0.000			
• Reprogrammings		0.000	0.000			
• SBIR/STTR Transfer		-6.059	0.000			
• Other Adjustments		-7.395	0.000	-28.230	0.000	-28.230
<u>Congressional Add Details (\$ in Millions, and Includes General Reductions)</u>						
Project: 623012: Advanced Propulsion Technology						
Congressional Add: Advanced Aerospace Fuels for Hypersonic Propulsion						
Congressional Add: Compact scramjet Testing						
Congressional Add Subtotals for Project: 623012						
Project: 623066: Turbine Engine Technology						
Congressional Add: Program Increase - Low-Cost Small Turbine Engine						
Congressional Add Subtotals for Project: 623066						
Project: 623145: Aerospace Power Technology						
Congressional Add: Program Increase: Rotary Machines with Advanced Magnetic Materials						
Congressional Add: Program Increase: Highly Electrified Aircraft						
Congressional Add: Program Increase - Emergency Power and Cooling Thermal Management Growth						
Congressional Add: Program Increase: High Voltage Aircraft Power						
Congressional Add: Program Increase: Improving Reliability of Electrical Systems for Future Aircraft						
Congressional Add: Program increase - Battery Additives						
Congressional Add Subtotals for Project: 623145						
		FY 2024	FY 2025			
		7.316	3.000			
		6.828	-			
		14.144	3.000			
		12.193	-			
		12.193	-			
		9.754	-			
		4.877	-			
		9.754	-			
		1.950	-			
		2.926	-			
		4.877	-			
		34.138	-			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research		R-1 Program Element (Number/Name) PE 0602203F I Aerospace Systems Technologies	
Congressional Add Details (\$ in Millions, and Includes General Reductions)		FY 2024	FY 2025
Congressional Add Totals for all Projects		60.475	3.000
Change Summary Explanation FY 2026 decreased compared to FY 2025 by -\$12.261 million due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency. Reduces civilian personnel full-time equivalents and funding to optimize the workforce in compliance with Executive Order 14210, "Implementing the President's Department of Government Efficiency Workforce Optimization Initiative."			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies				Project (Number/Name) 622401 / Structures			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
622401: Structures	0.000	0.000	76.135	74.989	0.000	74.989	-	-	-	-	-	-
A. Mission Description and Budget Item Justification												
This project performs technology development to advance aerodynamic and structural systems of the aerospace vehicle to address Department of the Air Force capability needs and anticipated future capability needs. Requisite technology area competencies in design, analysis, synthesis, and validation, work in synergy with design integration of other aerospace vehicle systems to define and provide technology gap solutions.												
FY 2026 change - 622401 "Structures" project is retitled "Aerodynamics and Structures Technology".												
In FY 2025, the entirety of PE 0602201F, Aerospace Vehicle Technologies, Project 622401 Structures and Project 622404 Aeromechanics, were transferred to PE 0602203F, Aerospace Propulsion, Project 622401 Structures (FY2026 Structures project retitled Aerodynamics and Structures Technology). This is an administrative realignment to provide increased enhanced project transparency and not a new start.												
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Title: Mission Optimized Aerospace Vehicles Technology Development								0.000	0.000	40.227	-	40.227
Description: Develop aerodynamics and structures technologies that address the mission requirements and associated capability gaps and unique attributes of a range of aerospace vehicles identified and prioritized by urgency for technology development. Technology development is accomplished with full consideration for systems interaction and integration in the aerospace vehicle component/system design, analysis, and experimental validation or verification activities.												
FY 2026 change - due to administrative transfer of work and funding into system level thrusts versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work.												
FY 2025 Plans:												
FY 2025 work and \$5.319 million transferred from Vehicle Design Technologies effort:												
- Continue integration of affordable manufacturing considerations in air vehicle design.												
FY 2025 work and \$21.924 million transferred from Structural Concepts effort:												
- Continue development of low-cost agile manufacturing concepts for structures in support of the development of a next variant of a low-cost unmanned aerospace system.												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025			
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 622401 / Structures		
B. Accomplishments/Planned Programs (\$ in Millions)						
		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- Continue the demonstration of the fatigue life of bonded unitized composite structures for the next generation of aircraft						
FY 2025 work and \$0.768 million transferred from Next Generation Aerodynamic Technologies effort: - Initiate the assessment of fuel and energy saving techniques for fleet application.						
FY 2025 work and \$10.355 million transferred from Aircraft Integration Technologies effort: - Continue the development of a modeling and simulation approach to the design and integration of embedded propulsion systems. - Initiate the demonstration of integrated propulsion for next generation air vehicle conceptual design.						
FY 2025 work and \$2.477 million transferred from Aerodynamic Systems Technology effort: - Continue the development of prediction methods which include air vehicle stability and control requirements.						
FY 2026 Base Plans: - Continue integration of affordable manufacturing considerations in air vehicle design for collaborative platform capability via manufacturing design. -Activities include design for manufacturing of a braided single piece wing box structure for demonstration via ground structural testing.						
- Continue development of air vehicle airframe low-cost, high-rate and agile manufacturing approaches to realize a low-cost unmanned aerospace system in development of future variants. -Activities include developing an in-situ manufacturing process optimization for press-based composite parts fabrication.						
- Continue fatigue analysis and demonstration for large aircraft bonded unitized composite wing and fuselage structures for next generation capabilities via efficient structural designs with increased structural reliability. -Activities include analytical model(s) development for critical composite structural configurations validated through structural testing.						
- Complete the assessment of fuel and energy saving techniques for next generation capabilities via sustainable aerial logistics delivery and weapons platforms in deployed environments. -Activities include active flow control techniques with advanced configurations.						

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025			
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 622401 / Structures		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- Continue the development of a modeling and simulation approach to the design and integration of embedded propulsion systems for next generation capabilities via relevant energy efficient engine configurations across various size classes of platforms. -Activities include engine inlet compatibility studies for multiple configurations - Continue the design of integrated propulsion for next generation air vehicle conceptual design for next generation capabilities with increased air vehicle survivability. -Activities include integrated multi-system design and assessment. - Continue the development of aerodynamic prediction methods for next generation capabilities with design guidelines for proximate flight of multiple air vehicles. -Activities include studies of air vehicle stability and control requirements of multiple bodies of relevant aerospace vehicle size classes. - Initiate the development of innovative weapons integration technologies to yield affordable collaborative platforms with enhanced weapon payload and release that avoid traditional volume considerations. -Activities include aerodynamic validation technique development for safe payload release and low-cost, novel approaches which maximize payload weapons loadout. - Initiate clean sheet design for next iteration of collaborative platform yielding groundbreaking affordable mass via configurations of flight to increase speed while also enhancing lift. -Activities include aerodynamic analysis, structural design, and systems integration for the conceptual design of a 3rd generation unmanned air vehicle platform. - Initiate technology maturation for cost and weight efficient designs of thermal airflow impinged structures for next generation capabilities with embedded engine configuration across a broader range of classes of platforms. -Activities include durability analysis for thermally exposed air vehicle structure and physical test article validation experiments. FY 2025 to FY 2026 Increase/Decrease Statement: <td></td> <td></td> <td></td> <td></td> <td></td>						

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force				Date: June 2025		
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 622401 / Structures		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
FY 2026 change - due to administrative transfer of work and funding into system level thrusts versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work to Mission Optimized Aerospace Vehicles Technology Development effort (details below): FY 2026 increased compared to FY 2025 by \$40.227 million: - \$40.843 million increase due to: - Transfer of work and \$5.319 million from Vehicle Design Technologies; - Transfer of work and \$21.924 million from Structural Concepts; - Transfer of work and \$0.768 million from Next Generation Aerodynamic Technologies; - Transfer of work and \$10.355 million from Aircraft Integration Technologies; - Transfer of work and \$2.477 million from Aerodynamics and Structures Technology; and - \$0.616 million decrease in FY 2026 PE 0602203F Aerospace Propulsion, Project 622401 Aerodynamics and Structures Technology due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency.						
Title: Rapid Aerospace Vehicles Design and Integration Technology Development Description: Develop aerodynamics and structures technologies in a multidisciplinary approach for aerospace vehicle application-agnostic competencies for maturation to address technology gaps resulting from mission-driven analysis unique to specific capability focus on next generation systems or forecasted future capability needs. FY 2026 change - due to administrative transfer of work and funding into system level thrusts versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work. FY 2025 Plans: FY 2025 work and \$12.411 million transfer from Vehicle Design Technologies effort: - Continue the development of advanced high fidelity aircraft design tools. - Continue the development of new design methods that link vehicle system requirements to mission operation performance. - Continue the integration of model-based systems engineering design tools with quantified risk methodologies. FY 2025 work and \$2.572 million transfer from Structural Concepts effort:		0.000	0.000	34.762	-	34.762

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025				
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies	Project (Number/Name) 622401 / Structures				
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- Continue digital and systems engineering assessments for the development of airworthiness certification criteria for advanced airframe structures. - Continue the validation of innovative structural design methods to dramatically reduce weight and complexity of aircraft structures. FY 2025 work and \$6.911 million transfer from Next Generation Aerodynamic Technologies effort: - Continue the development of advanced, high fidelity, aerodynamic analysis tools for aircraft conceptual design. - Continue assessment of innovative next generation vehicle concepts. - Continue digital modeling and simulation development for the assessment of fuel and energy use. FY 2025 work and \$6.915 million transfer from Aerodynamic Systems Technologies effort: - Continue the assessment and development of incorporating active flow control techniques into advanced, mission utility informed, aircraft vehicle configuration design techniques. - Initiate the technology maturation of long-endurance unmanned aircraft vehicle design. FY 2026 Base Plans: - Complete the development of advanced high fidelity aircraft design tools to yield faster, more complete advanced aircraft designs with measures of effectiveness; -Activities include development and validation of analytical solutions for design configurations that simultaneously evaluate combined aerodynamic, structural and thermal parameter effects. - Continue the development of new optimization design methods resulting in tool technology development for linking of vehicle system requirements to military utility and mission performance for effectiveness-based design; -Activities include creating differentiable mission analyses integrated into the air vehicle design process. - Continue the integration of model-based systems engineering design tools for tracking of design requirements to vehicle attributes for requirements driven decision making; -Activities include developing government reference architectures and creating a common access design/analysis database. - Complete digital and systems engineering assessments to yield design tools for advanced airframe structures; -Activities include developing a digital airworthiness model linked to design and analysis for demonstration on an unmanned air system.							

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force				Date: June 2025	
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 622401 / Structures	
B. Accomplishments/Planned Programs (\$ in Millions)					
	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- Complete the validation of innovative structural design methods for optimization to confirm design tools for reduced weight and complexity of aircraft structures using innovative manufacturing processes; -Activities include performing experimental validation of resulting structural demonstration articles. - Continue the development of advanced, high fidelity, aerodynamic analysis tools for aircraft conceptual design technology development via rapid exploration of the mission requirement / vehicle performance trade space in an integrated design process; -Activities include effectiveness based clean sheet design and munition separation analyses. - Continue the assessment of innovative next generation vehicle concepts developing tools to identify concepts with the highest potential to enhance system performance aligned to capability needs; -Activities include fusion of experimental data with computational results to yield rapid concept modeling. - Complete digital modeling and simulation development yielding tool technology development for assessment of various drag reduction technologies; -Activities include aerodynamic analyses validated via experiment. - Continue the assessment, development, and incorporation of active flow control techniques for mission utility informed, aircraft vehicle design configurations; -Activities include active flow control modeling with confirmation via experimental validation. - Complete the technology maturation of long-endurance unmanned aircraft vehicle design via exploitation of innovative wing lift distribution and aerial maneuvering for a tailless aircraft; -Activities include in-house component modelling and prototyping. - Initiate structures technology development for affordable mass with design tools to yield tool technology development via higher performance with unique material integration techniques and digital tools for certification; - Activities include component design for manufacturing with component build and structural validation test. - Initiate development of methods for expanded analysis and design exploration for integrated systems' interaction in aerospace vehicles via risk-quantified technology investment validated with experimentation;					

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Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 622401 / Structures		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
-Activities include data assimilation to incorporate experimental results into the design process, and methodology development to optimally package and integrate subsystems within the airframe. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 change - due to administrative transfer of work and funding into system level thrusts versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work to Rapid Aerospace Vehicles Design and Integration Technology Development effort (details below): FY 2026 increased compared to FY 2025 by \$38.922 million: - \$28.809 million due to: - Transfer of work and \$12.411 million from FY2025 Vehicle Design Technologies; - Transfer of work and \$2.572 million from Structural Concepts; - Transfer of work and \$6.911 million from Next Generation Aerodynamic Technologies; and - Transfer of work and \$6.915 million from Aerodynamic Systems Technologies; - \$5.953 million increase due to increased emphasis on innovative technology approaches to achieve affordable mass, analytical tool development for air vehicle systems integration, and conceptual design tools development: - \$6.483 million from Aircraft Integration Technology effort; and - \$0.530 million decrease in FY 2026 PE 0602203F Aerospace Propulsion, Project 622401 Aerodynamics and Structures Technology due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency.						
Title: Vehicle Design Technologies Description: Develop methodologies to reduce the cost and time involved from design to full-scale testing of structural concepts and aerospace systems. FY 2026 change - due to administrative transfer of work and funding into system level thrusts versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work. For FY 2024 and prior years, this work was performed under PE 0602201F, Aerospace Vehicle Technologies, Project 622401, Structures, Vehicle Design Technologies effort. FY 2025 Plans: - Continue the development of advanced high fidelity aircraft design tools.		0.000	17.730	0.000	-	0.000

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Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 622401 / Structures		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- Continue the development of new design methods that link vehicle system requirements to mission operation performance. - Continue the integration of model-based systems engineering design tools with quantified risk methodologies. - Continue integration of affordable manufacturing considerations in air vehicle design. FY 2026 Base Plans: Transfer of work and funds of \$5.319 million to Mission Optimized Aerospace Vehicles Technology Development and \$12.411 million to Rapid Aerospace Vehicles Design and Integration Technology Development efforts. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 change - due to administrative transfer of work and funding into system level thrusts versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work. FY 2026 decreased by \$17.730 million compared to FY 2025 due to: - Transfer of work and \$5.319 million to Mission Optimized Aerospace Vehicles Technology Development; and - Transfer of work and \$12.411 million to Rapid Aerospace Vehicles Design and Integration Technology Development efforts.						
Title: Structural Concepts Description: Develop design methods, processes, and lightweight, adaptive, and multifunctional structural concepts to capitalize on new materials, multi-role considerations, and technology integration into aircraft systems. FY 2026 change - due to administrative transfer of work and funding into system level thrusts versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work. For FY 2024 and prior years, this work was performed under PE 0602201F, Aerospace Vehicle Technologies, Project 622401, Structures, Structural Concepts effort. FY 2025 Plans: - Continue development of low-cost agile manufacturing concepts for structures in support of the development of a next variant of a low-cost unmanned aerospace system. - Continue digital and systems engineering assessments for the development of airworthiness certification criteria for advanced airframe structures.		0.000	24.496	0.000	-	0.000

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Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 622401 / Structures		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- Continue the validation of innovative structural design methods to dramatically reduce weight and complexity of aircraft structures. - Continue the demonstration of the fatigue life of bonded unitized composite structures for the next generation of aircraft. FY 2026 Base Plans: Transfer of plans and funds of \$21.924 million to Mission Optimized Aerospace Vehicles Technology Development, and \$2.572 million to Rapid Aerospace Vehicles Design and Integration Technology Development efforts. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 change - due to administrative transfer of work and funding into system level thrusts versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work. FY 2026 decreased by \$24.496 million compared to FY 2025 due to: - Transfer of work and \$21.924 million to Mission Optimized Aerospace Vehicles Technology Development; and - Transfer of work and \$2.572 million to Rapid Aerospace Vehicles Design and Integration Technology Development efforts.						
Title: Next Generation Aerodynamic Technologies Description: Develop and assess technologies for the next generation of multi-role large aircraft. FY 2026 change - due to administrative transfer of work and funding into system level thrusts versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work. For FY 2024 and prior years, this work was performed under PE 0602201F, Aerospace Vehicle Technologies, Project 622401, Structures, Next Generation Aerodynamic Technologies effort. FY 2025 Plans: - Continue the development of advanced, high fidelity, aerodynamic analysis tools for aircraft conceptual design. - Continue assessment of innovative next generation vehicle concepts. - Continue digital modeling and simulation development for the assessment of fuel and energy use. - Initiate the assessment of fuel and energy saving techniques for fleet application. FY 2026 Base Plans:		0.000	7.679	0.000	-	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025				
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies	Project (Number/Name) 622401 / Structures				
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Transfer of plans and funds of \$0.768 million Mission Optimized Aerospace Vehicles Technology Development, and \$6.911 million to Rapid Aerospace Vehicles Design and Integration Technology Development efforts. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 change - due to administrative transfer of work and funding into system level thrusts versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work. FY 2026 decreased by \$7.679 million compared to FY2025 due to: - Transfer of work and \$0.768 million to Mission Optimized Aerospace Vehicles Technology Development; and - Transfer of work and \$6.911 million to Rapid Aerospace Vehicles Design and Integration Technology Development efforts.							
Title: Aircraft Integration Technologies Description: Develop enabling technologies to allow efficient and effective integration of propulsion, weapons, and subsystems into current and future air vehicles. FY 2026 change - due to administrative transfer of work and funding into system level thrusts versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work. For FY 2024 and prior years, this work was performed under PE 0602201F, Aerospace Vehicle Technologies, Project 622401, Structures, Aircraft Integration Technologies effort. FY 2025 Plans: - Complete the development of novel kinetic weapons integration technologies for enhanced weapon payload in affordable platforms. - Continue the development of a modeling and simulation approach to the design and integration of embedded propulsion systems. - Initiate the demonstration of integrated propulsion for next generation air vehicle conceptual design. FY 2026 Base Plans: Transfer of plans and funds of \$10.355 million to Mission Optimized Aerospace Vehicles Technology Development and \$6.483 million to Rapid Mission Driven Aerospace Vehicles Design and Integration Technology Development efforts. FY 2025 to FY 2026 Increase/Decrease Statement:			0.000	16.838	0.000	-	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025			
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 622401 / Structures		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
FY 2026 change - due to administrative transfer of work and funding into system level thrusts versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work.						
FY 2026 decreased by \$16.838 million compared to FY 2025 due to: - Transfer of work and \$10.355 million to Mission Optimized Aerospace Vehicles Technology Development effort; and - Transfer of \$6.483 million to Rapid Aerospace Vehicles Design and Integration Technology Development effort due to completion of novel kinetic weapons integration technology development work.						
Title: Aerodynamic Systems Technology Description: Develop aerodynamic assessment prediction methods centered on expanding the design capabilities of future air vehicles. For FY 2024 and prior years, this work was performed under PE 0602201F, Aerospace Vehicle Technologies, Project 622404, Aeromechanics, Aerodynamic Systems Technologies effort. FY 2025 Plans: - Continue the assessment and development of incorporating active flow control techniques into advanced, mission utility informed, aircraft vehicle configuration design techniques. - Complete design assessments of long-endurance unmanned platforms. - Continue the development of prediction methods which include air vehicle stability and control requirements. - Initiate the technology maturation of long-endurance unmanned aircraft vehicle design. FY 2026 Base Plans: Transfer of plans and funds of \$2.477 million to Mission Optimized Aerospace Vehicles Technology Development and \$6.915 million to Rapid Aerospace Vehicles Design and Integration Technology Development efforts. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 change - due to administrative transfer of work and funding into system level thrusts versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work. FY 2026 decreased by \$9.392 million compared to FY 2025 due to: - Transfer of work and \$2.477 million to Mission Optimized Aerospace Vehicles Technology Development and		0.000	9.392	0.000	-	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force				Date: June 2025		
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 622401 / Structures		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- Transfer of work and \$6.915 million Rapid Aerospace Vehicles Design and Integration Technology Development efforts.						
Accomplishments/Planned Programs Subtotals		0.000	76.135	74.989	-	74.989
C. Other Program Funding Summary (\$ in Millions) N/A						
Remarks						
D. Acquisition Strategy Not applicable.						

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies				Project (Number/Name) 622403 / Flight Controls and Pilot-Vehicle Interface			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
622403: Flight Controls and Pilot-Vehicle Interface	0.000	0.000	42.659	76.072	0.000	76.072	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This project is dedicated to advancing technologies for manned, remotely piloted, and autonomous aerospace vehicles, with a focus on achieving maximum performance and affordability. The development of advanced control, automation, and autonomy technologies is a key aspect, aiming to deliver safe and efficient vehicle operation and mission execution through the use of digital engineering, flight experimentation, and evaluation. These efforts contribute significantly to the development of reliable autonomous collaborative platforms, high-speed aircraft, and operational aircraft. Furthermore, the project encompasses the design of integrated electrical and thermal management components, controls, and systems for military aerospace applications, ensuring that the power and thermal needs of future aerospace capabilities can be met. By developing controls and system integration technologies, the project also ensures the interoperability of aircraft, power, thermal, engine, and other systems and subsystems, ultimately supporting the development of electrical power and thermal management components, controls, and systems suitable for various aircraft platforms, including autonomous collaborative platforms and future aircraft, while addressing reliability, maintainability, affordability, and supportability.

FY 2026 Changes:

- Due to administrative transfer of work and funding (\$38.640 million) from 623145, Aerospace Power Technology project to 622403, Aerospace Power & Flight Control Technology project for system level thrusts versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work.
- 622403 "Flight Controls and Pilot-Vehicle Interface" project is retitled "Aerospace Power & Flight Control Technology".

FY 2025, the entirety of PE 0602201F, Aerospace Vehicle Technologies, Project 622403 Flight Controls and Pilot-Vehicle Interface, was transferred to PE 0602203F, Aerospace Propulsion, Project 622403 Flight Controls and Pilot-Vehicle Interface. This is an administrative realignment to provide increased enhanced project transparency and not a new start

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

	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Title: Autonomy Technology Development	0.000	0.000	31.950	-	31.950
Description: Develop control tools and technologies for autonomous collaborative platforms in adverse and contested environments to address all aspects of flight and robust mission performance. Develop technologies for advanced control- enabled capabilities, including flight controls, components, integrated vehicle management systems, and software and system certification techniques to enable Autonomy Technology Development for Autonomous Collaboration and affordable mass, including usage of a Government Reference Architecture.					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025			
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 622403 / Flight Controls and Pilot-Vehicle Interface		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
FY 2026 change - due to administrative transfer of work and funding into system level thrusts versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work.						
FY 2025 Plans: Transfer of work and \$10.120 million from Advanced Flight Controls Technologies effort: - Continue the development of a trusted autonomy approach, integrating certification and assurance processes and autonomy development including tool development to enhance the use of formal methods in autonomy development to accelerate validation of autonomy algorithms and transition timelines. - Continue the development, demonstration, and assessment of advanced autonomy capabilities for dynamic tasking in complex environments including development of knowledge-based AI decision architecture toward robust mission management for heterogeneous teams of autonomous collaborative platforms. - Continue the development of autonomy optimization and assurance in dynamic and uncertain environment including rigorous extensions to optimization techniques to enable better autonomous behavior under uncertainty. Transfer of work and \$24.552 million from Manned and Unmanned Teaming Technologies effort: - Continue the development of mission management autonomy for manned-unmanned team to include extending an autonomy framework for autonomous collaborative platforms to be able to leverage existing autonomy library. - Continue the development, demonstration, and assessment of autonomous behaviors to address mission capability gaps to include modeling, simulation, and assessment of dynamic task allocation behaviors to better inform this and other autonomy developments.						
FY 2026 Base Plans: - Complete the development of a trusted autonomy approach. -Activities include the development of tools and techniques for run-time assurance. - Complete the development, demonstration, and assessment of advanced autonomy capabilities. -Activities include robust modeling and simulation and scaled surrogate testing.						

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force				Date: June 2025		
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 622403 / Flight Controls and Pilot-Vehicle Interface		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- Complete the development of autonomy optimization and assurance in dynamic and uncertain environments. -Activities include developing goals in dynamic maneuvering and weapons engagement zone pursuit or avoidance. - Continue the development of a mission management autonomy framework. -Activities include enhancing compliance with and identifying required modifications to the standard. - Complete the development, demonstration, and assessment of autonomous behaviors. -Activities include advanced dynamic role/lane assignment, adaptive plan/mission management. - Initiate the development and evaluation of algorithm enhancements for a tactical scenario. -Activities include simulation and analysis of airspace deconfliction, counter-air tactics, and weapons employment. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 change - due to administrative transfer of work and funding into system level thrusts versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work to Autonomy Technology Development effort (details below). FY 2026 increased compared to FY 2025 by \$31.950 million: - \$34.672 million increase due to: - Transfer of work and \$10.120 million from Advanced Flight Controls Technologies effort; - Transfer of work and \$24.552 million from Manned and Unmanned Teaming Technologies effort; and - \$2.722 million decrease in PE 0602203F Aerospace Systems Technologies, Project Aerospace Power & Flight Control Technology due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency.						
Title: Advanced Flight Controls Technologies		0.000	10.120	0.000	-	0.000
Description: Develop technologies for advanced control-enabled capabilities, including flight controls, components, integrated vehicle management systems, and software and system certification techniques for both manned aircraft and autonomous collaborative platforms.						

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025				
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies	Project (Number/Name) 622403 / Flight Controls and Pilot-Vehicle Interface				
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
FY 2026 change - due to administrative transfer of work and funding into system level thrusts versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work. FY 2025 Plans: - Continue the development of a trusted autonomy approach, integrating certification and assurance processes and autonomy development including tool development to enhance the use of formal methods in autonomy development to accelerate validation of autonomy algorithms and transition timelines. - Continue the development, demonstration, and assessment of advanced autonomy capabilities for dynamic tasking in complex environments including development of knowledge-based AI decision architecture toward robust mission management for heterogeneous teams of autonomous collaborative platforms. - Continue the development of autonomy optimization and assurance in dynamic and uncertain environment including rigorous extensions to optimization techniques to enable better autonomous behavior under uncertainty. FY 2026 Base Plans: Transfer of plans and funding of \$10.120 million to Autonomy Technology Development. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased by \$10.120 million compared to FY 2025 due to administrative transfer of work and funding into system level thrusts versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work due to transfer of work to Autonomy Technology Development effort.							
Title: Manned and Unmanned Teaming Technologies Description: Develop technology for flight control systems that will permit safe interoperability between manned aircraft and autonomous collaborative platforms and effective teaming in adverse and contested environments. FY 2026 change - due to administrative transfer of work and funding into system level thrusts versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work. FY 2025 Plans:			0.000	24.552	0.000	-	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025			
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 622403 / Flight Controls and Pilot-Vehicle Interface		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- Complete the development of tactical autonomy for manned-unmanned teams in contested, dynamic mission environments. - Continue the development of mission management autonomy for manned-unmanned team to include extending an autonomy framework for autonomous collaborative platforms to be able to leverage existing autonomy library. - Continue the development, demonstration, and assessment of autonomous behaviors to address mission capability gaps to include modeling, simulation, and assessment of dynamic task allocation behaviors to better inform this and other autonomy developments. FY 2026 Base Plans: Transfer of plans and funding of \$24.552 million to Autonomy Technology Development. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 change - due to administrative transfer of work and funding into system level thrusts versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work. - FY 2026 decreased by \$24.552 million compared to FY 2025 due to administrative transfer of work and funding into system level thrusts versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work to Autonomy Technology Development effort.						
Title: Strategic Analysis Technology Development Description: Develop tools and methods that enhance digital materiel management for aerospace system capability research and development to enable enhanced, near-real-time decision making and rapid innovation from technology discovery to technology transition. Develop and apply tools and methods for simulation-based research and development of future aerospace system capabilities to enable efficient and effective assessment of emerging capabilities in multi-domain battlespace simulation environments resulting in focused science and technology investments toward modern operational challenges. FY 2026 change - "Flight Controls Technologies Modeling and Simulation" effort is retitled "Strategic Analysis Technology and Tool Development". FY 2025 Plans:		0.000	7.987	9.129	-	9.129

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025			
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 622403 / Flight Controls and Pilot-Vehicle Interface		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- Complete manned-unmanned teaming evaluations including rapid development of new integrated capabilities. - Continue analyses of concepts for future advanced development capabilities. - Continue modeling and simulation efforts to assess emerging aerospace technologies in complex and dynamic battlespace environments. - Continue digital engineering efforts to create a digital continuum of military utility and cost effectiveness analysis for investment planning from technology development to technology transition. - Initiate foundational and applied research in mission engineering. FY 2026 Base Plans: - Continue analyses of future advanced aerospace technology gaps and capability concepts. -Activities include analysis in the areas of autonomous collaborative platforms and responsive strike capabilities. - Continue model and simulation tool development. -Activities include establishing lifecycle analysis methods in concert with operational impact analysis to enhance the modeling of longer duration operational timelines. - Continue establishment of digital engineering processes and practices. -Activities include integration of model-based systems engineering practices and the creation of a shared model repository. - Continue research into mission engineering in aerospace system simulation sciences. -Activities include improving immersive simulations with virtual/mixed-reality technologies and enhancing the usage of mixed fidelity models. - Initiate applied research in enhancing analytical methods with artificial intelligence -Activities include developing generative artificial intelligence user interfaces for our analytical tools and employing artificial intelligence methods to gain computational efficiencies through model abstraction. - Initiate the development of an enterprise data ecosystem.						

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force				Date: June 2025		
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 622403 / Flight Controls and Pilot-Vehicle Interface		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
-Activities include creating a data inventory, assessing data maturity, and establishing an environment for storing and managing data. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$1.142 million due to increased emphasis in strategic analysis to enhance analytical methods by leveraging artificial intelligence, improve decision making and accelerate Department of the Air Force mission capabilities by incorporating lifecycle and longer duration timeline into analysis.						
Title: Power and Thermal Systems Technology Development Description: Develop integrated system architectures, controls, and component technologies to meet the high electrical power demands and concurrent thermal mitigation required by current and future manned and unmanned systems, including hybrid architectures and digital development and experimentation. Address the challenges imposed by the decreased volume, surface area, airflow, etc. of Autonomous Collaborative Platforms relative to current combat aircraft. Address the challenges imposed by hypersonic aircraft scaling and increased flight durations. FY 2026 change - due to administrative transfer of work and funding to project and system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation of work. 0602203F Aerospace Systems Technologies (FY 2025 Aerospace Propulsion), 623145 Aerospace Power Technology Project, High Power System Technologies transferred to 622403, Aerospace Power & Flight Control Technology project, Power and Thermal Management Technology Development effort. FY 2025 Plans: FY 2026 change - due to administrative transfer of work and funding from 0602203F Aerospace Systems Technologies (FY 2025 Aerospace Propulsion), 623145 Aerospace Power Technology Project, High Power System Technologies effort. - Continue testing of subsystems hardware in conjunction with continued platform level tip-to-tail modeling and simulation for energy optimization including update of Digital System Model for government subsystem architecture for autonomous collaborative platforms to provide sharable power and thermal model baseline for industry and government use.		0.000	0.000	34.993	-	34.993

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025			
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 622403 / Flight Controls and Pilot-Vehicle Interface		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- Continue medium-scale propulsion, power and thermal system studies and development to include innovative, integrated hybrid architectures including medium scale vapor cycle systems to provide greater thermal capacity to autonomous collaborative platforms. - Continue development of advanced power and thermal capabilities for future hypersonic aircraft including power generation prototypes for high-temperature long-endurance missions to enable new platform capabilities. - Continue development of adaptive, affordable power and thermal technologies for emerging medium-scale platforms and mission capabilities including hardware-in-the-loop evaluation of electric flight control actuators to provide cost effective electric architectures and validated digital models. - Continue development of advanced vehicle energy management capabilities including modeling and analysis of path planning for energy management on autonomous collaborative platforms to provide benefits assessment, such as for extended range FY 2026 Base Plans: - Complete testing of subsystems hardware. - Activities include portable power system emulation, transient mission system architectures, distributed electric propulsion architectures, and digital system models for various autonomous collaborative platforms. - Complete medium-scale propulsion, power and thermal system studies and development. - Activities include studies and development of medium scale vapor cycle systems to provide greater thermal capacity to autonomous collaborative platforms. - Continue development of advanced power and thermal capabilities. - Activities include closed-loop power cycles, solid-state thermal-electrical conversion, high lift thermal management, and applied scientific advancements. - Complete development of adaptive, affordable power and thermal technologies. - Activities include maturation of high voltage power generation with integrated energy storage. - Complete development of advanced vehicle energy management capabilities.						

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force				Date: June 2025		
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / <i>Aerospace Systems Technologies</i>		Project (Number/Name) 622403 / <i>Flight Controls and Pilot-Vehicle Interface</i>		
B. Accomplishments/Planned Programs (\$ in Millions)						
		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- Activities include energy aware path planning for autonomous collaborative platforms. - Initiate the development of power, thermal management and controls technologies for modular electrified aircraft. - Activities include assessment of current state of the art in such areas as motors, generators, inverters, and distributed thermal management. <i>FY 2025 to FY 2026 Increase/Decrease Statement:</i> FY 2026 increased compared to FY 2025 by \$34.993 million due to: - FY 2026 change - due to administrative transfer of work and funding (\$38.640 million) to project and system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation of work from 0602203F Aerospace Systems Technologies (FY 2025 Aerospace Propulsion), Project 623145 Aerospace Power Technology, High Power System Technologies effort; and - \$3.647 million decrease in PE 0602203F Aerospace Systems Technologies, Project Aerospace Power & Flight Control Technology due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency.						
Accomplishments/Planned Programs Subtotals		0.000	42.659	76.072	-	76.072
C. Other Program Funding Summary (\$ in Millions) N/A						
Remarks FY 2026 change - due to administrative transfer of work and funding (\$38.640 million) from 623145 Aerospace Power Technology project to 622403 Aerospace Power & Flight Control Technology project for system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation of work.						
D. Acquisition Strategy Not applicable.						

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies				Project (Number/Name) 622405 / High Speed Systems Technology			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
622405: High Speed Systems Technology	0.000	0.000	41.137	55.234	0.000	55.234	-	-	-	-	-	-
A. Mission Description and Budget Item Justification												
This project investigates, analyzes, and develops applied technologies that enable future multi-Mach, responsive high-speed/hypersonic weapons and platforms (vehicles) via modeling, simulation and analysis (MS&A), and ground and flight tests. The extreme conditions high-speed/hypersonic weapons or platforms are subjected to manifest as complex multi-disciplinary technical challenges, namely: durability, broad operability from Mach 0 to Mach 5+ (multi-Mach operability), vehicle-level integrated power and thermal management, and integration of mission systems. The development of technical solutions to these multi-disciplinary challenges at the subsystem level, and the subsequent integration of them at the system level, is critical to reduce the risk and time required to transition technologies into operational systems. Digital material management is utilized to develop and deliver an integrated digital environment (IDE) to assess technology, evaluate its impacts, and make capability-focused investment decisions.												
FY 2026 change - due to administrative transfer of work and funding (\$18.430 million) from 623012 Advanced Propulsion Technology project to 622405 High Speed Systems Technology project for system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation of work.												
In FY 2025, the entirety of PE 0602201F, Aerospace Vehicle Technologies, Project 622405 High Speed Systems Technology, was transferred to PE 0602203F, Aerospace Propulsion, Project 622405 High Speed Systems Technology. This is an administrative realignment to provide increased enhanced project transparency and not a new start.												
B. Accomplishments/Planned Programs (\$ in Millions)							FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	
Title: High-Speed Systems Technology Development							0.000	23.885	22.718	-	22.718	
Description: Develop design analysis methods and technologies for high-speed systems at extreme flight conditions.												
Efforts will enable validation methods and analysis tools for design, test and certification of hypersonic vehicles; high speed system design, analysis, and development; revolutionary capabilities for affordable expendable and robust, survivable systems.												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025					
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 622405 / High Speed Systems Technology				
B. Accomplishments/Planned Programs (\$ in Millions)				FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
FY 2026 change - "High-Speed Systems Technology" effort is retitled "High-Speed Systems Technology Development". FY 2025 Plans: - Continue critical technology maturation for high speed/ hypersonic systems with secondary emphasis on longer range flight and heavier payloads. - Continue maturation of innovative aerospace structural concepts, analytical methods, service life predictions, airframe/engine integration, fluid/thermal/structural interactions and thermal management techniques. - Continue development of high-speed system concepts, including flight research concepts, to provide revolutionary capabilities for affordable expendable systems and robust reusable systems. - Continue efforts to characterize high-speed vehicle system phenomena, develop and validate fundamental high-speed component technologies through computational analysis, ground, and flight testing. - Initiate critical technology maturation for high speed/ hypersonic systems with primary emphasis on reusable platforms/systems, including: validated modeling, simulation, and analysis techniques, mission system integration, operability and performance over expanded mission requirements, vehicle durability, and vehicle-level thermal management. FY 2026 Base Plans: - Continue critical technology maturation for increased service life of high speed/ hypersonic systems with secondary emphasis on longer range flight and heavier payloads; -Activities include assessments for service life and durability of vehicle structures. - Complete maturation of innovative aerospace structural concepts, analytical methods, service life predictions, airframe/engine integration, fluid/thermal/structural interactions, and thermal management techniques; -Activities include development of novel reduced order methods, airframe/engine integration validation, and fluid/thermal/structural interaction validation data. - Continue development of high-speed system concepts;								

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force				Date: June 2025		
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 622405 / High Speed Systems Technology		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
-Activities include flight research concepts, high-speed system design, analysis, and development and tech assessments. - Continue efforts to characterize high-speed vehicle system phenomena, develop and validate fundamental high-speed component technologies; -Activities include computational analysis and ground/flight testing. - Continue critical technology maturation for high speed/ hypersonic systems with primary emphasis on durable, survivable platforms/systems, including validated modeling, simulation, and analysis (MS&A), mission system integration, operability and performance over expanded mission requirements, vehicle durability, and vehicle-level thermal management; -Activities include validation of service life predictions for reusable vehicles, identification of critical design features, and development of state-of-the-art digital engineering datasets and models. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$1.167 million due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency.						
Title: High Speed Vehicle Aeromechanics Technology Development Description: Develop new and improved components, concepts, and designs for sustained flight of high-speed/ hypersonic expendable and re-useable vehicles. Conduct analysis of high speed/hypersonic vehicles to enable revolutionary capabilities. Efforts will enable multi-Mach platforms capable of normal runway, approach, departure and other off-cruise operations while maintaining high-Mach number cruise capability; expansion of design and analysis capabilities that inform capability-focused tech investments for high-speed vehicle concepts; data-driven decisions when evaluating next generation hypersonic designs; stores separation development; improved understanding of multi-Mach fluid dynamic phenomena; design of efficient control surfaces and actuators for high speeds; efficient engine operations over multi-Mach flight regime; next-gen high speed system integrated design, analysis, and development across the entire integrated vehicle; mature technology solutions required to close the kill chain using weapons released from high-speed platforms.		0.000	17.252	15.353	-	15.353

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025				
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / <i>Aerospace Systems Technologies</i>		Project (Number/Name) 622405 / <i>High Speed Systems Technology</i>			
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
FY 2026 change - "High-Speed Vehicle Aeromechanics and Integration" effort is retitled "High-Speed Vehicle Aeromechanics Technology Development". FY 2025 Plans: - Continue to mature critical technologies for high speed/hypersonic flight with primary emphasis on reusable systems and secondary emphasis on longer range and heavier payloads. - Continue development of multi-disciplinary design and analysis techniques and tools with emphasis on the digital engineering environment. - Continue development of high-speed system concepts that provide revolutionary capabilities through configuration research. - Continue investigation of aeromechanic technologies to evaluate uncertainty, improve instrumentation accuracy and safe multi-body physics. - Continue efforts to characterize high-speed aeromechanics phenomena and develop and validate fundamental high-speed component technologies through computational analysis, ground, and flight testing. - Continue investigation of advanced aeromechanic technologies to extend system range through improvement of system lift/drag ratio and maintain robust stability and control at all flight conditions. - Continue investigation of computational and ground based experimental approaches to improved air induction systems over a wide range of flight conditions. - Initiate critical technology maturation for high speed/ hypersonic systems with primary emphasis on reusable platforms/systems, including: validated modeling, simulation, and analysis techniques, mission system integration, operability and performance over expanded mission requirements, vehicle durability, and vehicle-level thermal management. - Initiate critical vehicle aeromechanics and integration technology maturation for high speed/ hypersonic systems with primary emphasis on reusable platforms/systems, including: validated modeling, simulation,							

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025			
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 622405 / High Speed Systems Technology		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
and analysis techniques, mission system integration, operability and performance over expanded mission requirements, vehicle durability, and vehicle-level thermal management. FY 2026 Base Plans: - Continue to mature critical technologies for high speed/hypersonic flight with primary emphasis on durable, survivable systems and secondary emphasis on longer range and heavier payloads; -Activities include studies of low-speed performance, configuration trades, and data collection on high-speed platforms operating outside of cruise conditions. - Continue development of multi-disciplinary design and analysis techniques and tools with emphasis on the digital engineering environment; -Activities include vehicle geometry, trajectory and performance evaluations. - Continue development of high-speed system concepts that provide revolutionary capabilities through configuration research; -Activities include military utility assessments through mission effectiveness, campaign analyses, and wargames. - Complete investigation of aeromechanic technologies to evaluate uncertainty, improve instrumentation accuracy and safe multi-body physics; -Activities include systems integration, and aero, thermal, structural and acoustics. - Continue efforts to characterize high-speed aeromechanics (fluid-structure interaction) phenomena and develop and validate fundamental high-speed component technologies; -Activities include development of optical flow diagnostic techniques and computational and ground test of fluid structure interactions on relevant geometries. - Continue investigation of advanced aeromechanic technologies to extend system range through improvement of system lift/drag ratio and maintain robust stability and control at all flight conditions; -Activities include analytical studies and ground tests to determine important parameters affecting control surfaces, and effects of thermal deformation on controllability. - Continue investigation of computational and ground based experimental approaches to improve air induction systems over a wide range of flight conditions;						

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 622405 / High Speed Systems Technology	
B. Accomplishments/Planned Programs (\$ in Millions)					
	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
-Activities include variable geometry inlet technologies, wind tunnel testing and thermo-structural testing. - Continue critical technology maturation for high speed/ hypersonic systems with primary emphasis on durable, survivable platforms/systems, including validated modeling, simulation, and analysis (MS&A) techniques, mission system integration, operability and performance over expanded mission requirements, vehicle durability, and vehicle-level thermal management; -Activities include validation of service life predictions for multi-Mach vehicles, identification of critical design features, and development of state-of-the-art digital engineering datasets and models. - Continue critical vehicle aeromechanics and integration technology maturation for high speed/ hypersonic systems with primary emphasis on durable, survivable platforms/systems, including validated MS&A techniques, mission system integration, operability and performance over expanded mission requirements, vehicle durability, and vehicle-level thermal management; -Activities include identification of critical design features for global response, and development of state-of-the-art digital engineering datasets and models. - Initiate research on technologies required to close the kill chain using weapons released from a high-speed platform; -Activities include research to address tech gaps including aperture performance in a high-speed thermal environment, platform/weapon sensor operation, cavities sealing, weapon control post-dispense, optimal weapon attributes and dispense methods FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$1.899 million due to completion of investigation of aeromechanics of multi-body physics as well as adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency.					
Title: High Speed Propulsion Technology Development	0.000	0.000	17.163	-	17.163
Description: FY 2026 change - due to administrative transfer of work and funding to project and system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation of work.					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025				
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies	Project (Number/Name) 622405 / High Speed Systems Technology				
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
• 0602203F Aerospace Systems Technologies (FY 2025 Aerospace Propulsion), 623012, Advanced Propulsion Technology project, Hypersonic Scramjet Technologies effort transferred to 622405, High Speed Systems Technology project, High-Speed Propulsion Technology Development effort. Develop robust high-speed and hypersonic propulsion technologies, including hydrocarbon fueled scramjet, ramjet, and combined cycle engine components and technologies to improve performance, operability, durability, and scalability for future platforms. Efforts will enable improved responsive strike capability by improved operating margin and operating time for hypersonic and multi-Mach capable platforms, and enhanced high-speed air induction system starting, operability, and performance for propulsion integration concepts over a wide range of flight conditions. FY 2025 Plans: FY 2026 change - work and funds transferred in from 0602203F Aerospace Systems Technologies (FY 2025 Aerospace Propulsion), 623012, Advanced Propulsion Technology project, Hypersonic Scramjet Technologies effort. - Continue development and demonstration of advanced, high-speed engine components to improve operating margin and operating time for expendable and reusable applications. - Continue development of low internal drag flame stabilization devices, instrumentation, advanced and endothermic fuels, and flight test engine components. - Continue development of design and analysis techniques and tools as well as experimental approaches to enable enhanced high-speed air induction system starting, operability, and performance for propulsion integration concepts over a wide range of flight conditions. - Continue propulsion studies and design efforts required for the development and demonstration of an engine flight test that expands the flight environment of current high-speed propulsion systems. - Initiate critical technology maturation for high speed and hypersonic propulsion systems with primary emphasis on reusable platforms/systems, including validated modeling, simulation, and analysis techniques, engine							

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025			
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 622405 / High Speed Systems Technology		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
operability and performance over expanded flight Mach number ranges, propulsive system durability, and thermal management. FY 2026 Base Plans: - Continue development and demonstration of advanced, high-speed engine components; -Activities include combustor design development and evaluation, inlet/isolator evaluation, nozzle evaluation and thermal management. - Continue development of low internal drag flame stabilization devices, instrumentation, endothermic fuels, and flight test engine components; -Activities include combustor operability evaluation, combustion diagnostics development, and fuel evaluations. - Continue development of design and analysis techniques and tools as well as experimental approaches; -Activities include wind tunnel testing, thrust measurements, and analytical model development. - Complete propulsion studies and design efforts required for the development and demonstration of an engine flight test that expands the flight environment of current high-speed propulsion systems; -Activities include active engine controls component development and demonstration. - Continue critical technology maturation for high speed and hypersonic propulsion systems with primary emphasis on durable, survivable platforms/systems; -Activities include validated modeling, simulation, and analysis (MS&A) techniques, engine operability and performance over expanded flight Mach number ranges, propulsive system durability, and thermal management. - Initiate advanced material, structural interaction, and aerodynamic evaluations. -Activities include advanced material testing for thermal management, boundary layer / transition modeling for external heating aero, fluid-thermal-structural interaction modeling and evaluation, and store separation modeling and analyses. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$17.163 million due to: - FY 2026 change - due to administrative transfer of work and funding (\$18.430 million) to project and system level thrusts versus component level to enable acceleration of integrated system capabilities and capture						

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025			
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 622405 / High Speed Systems Technology		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
realistic representation of work from 0602203F Aerospace Systems Technologies (FY 2025 Aerospace Propulsion), 623012, Advanced Propulsion Technology project, Hypersonic Scramjet Technologies; and - \$1.267 million decrease due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency.						
Accomplishments/Planned Programs Subtotals		0.000	41.137	55.234	-	55.234
C. Other Program Funding Summary (\$ in Millions) N/A						
Remarks FY 2026 change - due to administrative transfer of work and funding (\$18.430 million) from 623012 Advanced Propulsion Technology project to 622405 High Speed Systems Technology project for system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation of work.						
D. Acquisition Strategy Not applicable.						

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies				Project (Number/Name) 623012 / Advanced Propulsion Technology			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
623012: Advanced Propulsion Technology	0.000	31.331	21.430	0.000	0.000	0.000	-	-	-	-	-	-
A. Mission Description and Budget Item Justification												
This project develops combined/advanced cycle air breathing high-speed and hypersonic propulsion technologies to provide revolutionary propulsion options for the Air Force. These new engine technologies will enable future high-speed/hypersonic weapons and aircraft concepts. The primary focus is on hydrocarbon-fueled engines capable of operating over a broad range of flight Mach numbers. Efforts include modeling, simulations, and proof of concept demonstrations of critical components; advanced component development; and ground-based demonstrations.												
FY 2026 change - due to administrative transfer of work and funding (18.430 million) from 623012 Advanced Propulsion Technology project to 622405 High Speed Systems Technology project for system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation of work.												
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Title: Hypersonic Scramjet Technologies								17.187	18.430	0.000	-	0.000
Description: Develop robust high-speed and hypersonic propulsion technologies, including hydrocarbon fueled scramjet, ramjet, and combined cycle engine components and technologies to improve performance, operability, durability, and scalability for future platforms.												
FY 2025 Plans:												
- Continue development and demonstration of advanced, high-speed engine components to improve operating margin and operating time for expendable and reusable applications.												
- Continue development of low internal drag flame stabilization devices, instrumentation, advanced and endothermic fuels, and flight test engine components.												
- Continue development of design and analysis techniques and tools as well as experimental approaches to enable enhanced high-speed air induction system starting, operability, and performance for propulsion integration concepts over a wide range of flight conditions.												
- Continue propulsion studies and design efforts required for the development and demonstration of an engine flight test that expands the flight environment of current high-speed propulsion systems.												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025			
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 623012 / Advanced Propulsion Technology		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- Initiate critical technology maturation for high speed and hypersonic propulsion systems with primary emphasis on reusable platforms/systems, including validated modeling, simulation, and analysis techniques, engine operability and performance over expanded flight Mach number ranges, propulsive system durability, and thermal management. FY 2026 Base Plans: FY 2026 change - due to administrative transfer of work and funding to system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation of work. - 0602203F Aerospace Systems Technologies (FY 2025 Aerospace Propulsion), 623012, Advanced Propulsion Technology project, Hypersonic Scramjet Technologies effort transferred to 622405, High Speed Systems Technology project, High-Speed Propulsion Technology Development effort. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY2025 by \$18.430 million due to administrative transfer of work and funding from 623012 Advanced Propulsion Technology project, Hypersonic Scramjet Technologies effort to 622405 High Speed Systems Technology project, High-Speed Propulsion Technology Development effort for system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation of work.						
Accomplishments/Planned Programs Subtotals		17.187	18.430	0.000	-	0.000
		FY 2024	FY 2025			
Congressional Add: Advanced Aerospace Fuels for Hypersonic Propulsion		7.316	3.000			
FY 2024 Accomplishments: Conduct Congressionally directed efforts.						
FY 2025 Plans: Conduct Congressionally directed efforts.						
Congressional Add: Compact scramjet Testing		6.828	-			
FY 2024 Accomplishments: Conduct Congressionally directed efforts.						
Congressional Adds Subtotals		14.144	3.000			
C. Other Program Funding Summary (\$ in Millions)						
N/A						

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies	Project (Number/Name) 623012 / Advanced Propulsion Technology
C. Other Program Funding Summary (\$ in Millions)		
Remarks FY 2026 change - due to administrative transfer of work and funding (\$18.430 million) from 623012 Advanced Propulsion Technology project to 622405 High Speed Systems Technology project for system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation of work.		
D. Acquisition Strategy Not applicable.		

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies				Project (Number/Name) 623048 / Combustion and Mechanical Systems			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
623048: Combustion and Mechanical Systems	0.000	4.845	0.000	0.000	0.000	0.000	-	-	-	-	-	-
A. Mission Description and Budget Item Justification This project evaluates lubricants, for advanced turbine engines, and combined cycle engines with emphasis on low cost and high-speed applications. In FY 2025, Lubricant Technologies effort in this project will transfer to Program 0602203F, Aerospace Propulsion, Project 623066, Turbine Engine Technology, to align resources to Aerospace Systems Core Technical Competencies.												
B. Accomplishments/Planned Programs (\$ in Millions)							FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	
Title: Lubricant Technologies Description: Develop, test, and model advanced turbine engine lubricants and applied lubrication technologies. FY 2025 Plans: In FY 2025, Lubricant Technologies effort in this project will transfer to Program 0602203F, Aerospace Propulsion, Project 623066, Turbine Engine Technology, to align resources to Aerospace Systems Core Technical Competencies. FY 2026 Base Plans: Not Applicable FY 2026 OOC Plans: Not Applicable FY 2025 to FY 2026 Increase/Decrease Statement: Not Applicable							4.845	0.000	0.000	0.000	0.000	
Accomplishments/Planned Programs Subtotals							4.845	0.000	0.000	0.000	0.000	
C. Other Program Funding Summary (\$ in Millions) N/A												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies	Project (Number/Name) 623048 / Combustion and Mechanical Systems
C. Other Program Funding Summary (\$ in Millions)		
<u>Remarks</u> In FY 2025, Lubricant Technologies effort in this project will transfer to Program 0602203F, Aerospace Propulsion, Project 623066, Turbine Engine Technology, to align resources to Aerospace Systems Core Technical Competencies.		
<u>D. Acquisition Strategy</u> Not applicable.		

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies				Project (Number/Name) 623066 / Turbine Engine Technology			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
623066: Turbine Engine Technology	0.000	81.080	70.931	71.804	0.000	71.804	-	-	-	-	-	-
A. Mission Description and Budget Item Justification This project develops air breathing engine technology to address military specific needs for manned systems, autonomous vehicles, and munition applications. Technology development includes Mission Optimized Air Breathing Propulsion Technology Development and Revolutionary Propulsion Technology Development by utilizing military utility and physics-based analysis. FY 2026 change - due to administrative transfer of work and funding to system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation of work. In FY 2025, Lubricant Technologies efforts transferred from PE 0602203F, Aerospace Propulsion, Project 623048, Combustion and Mechanical Systems, to 623066 Turbine Engine Technology project, to align resources to Aerospace Systems priorities.												
B. Accomplishments/Planned Programs (\$ in Millions)							FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	
Title: Mission Optimized Air Breathing Propulsion Technology Development							0.000	0.000	41.533	-	41.533	
Description: Air Breathing Propulsion Technology Development for Autonomous Collaboration Embedded Applications, Low-Cost, and Mass Producibility. Technology focus on high quantity production and affordability consistent with survivability and performance requirements: improvements to compressor fan for embedded applications, model validation and reducing design time. FY 2026 change - due to administrative transfer of work and funding to system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation of work. FY 2025 Plans: FY 2026 administrative transfer of FY 2025 work of \$26.339 million from Turbine Engine Components effort: - Continue development of improved aerodynamic design tools and analysis methods to extend engine operability and efficiency by advancing rules and tools to perform integrated engine design to meet modeling, simulation, and analysis defined capabilities - Continue transonic fan distortion tolerance and transfer study to enable design-for-integration and reliable assessment for embedded engines by advancing design activities for distortion tolerant fan components - Continue high lift /high work turbine study to reduce turbine stage /blade count.												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025			
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 623066 / Turbine Engine Technology		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- Continue design of compressors and turbines for limited life and affordability - Initiate demonstration of high efficiency, high durability propulsion components tailored for embedded systems - Initiate engine component validated methodologies to trade engine life, cost and performance FY 2026 administrative transfer of FY 2025 work of \$7.872 million from Engine Technologies for Autonomous Vehicles and Munitions effort: - Continue multi-disciplinary design & optimization, systems engineering & digital engineering frameworks - Continue development of predictive analysis tools to enable reliable, sufficiently durable component designs for Autonomous Collaborative Platforms (ACP). - Initiate component failure mode investigations. FY 2026 administrative transfer of FY 2025 work of \$4.845 million from Lubricant Technologies effort - Continue studies on bearings nonoil lubrication technologies for limited life systems. FY 2026 Base Plans: - Complete development studies to extend engine operability and efficiency by advancing rules and integrated engine design tools. - Aerodynamic design tools and analysis methods to meet modeling, simulation, and analysis defined capabilities. - Complete design-for-integration and assessment for embedded engines by advancing design activities for distortion tolerant fan components - Transonic fan distortion tolerance and transfer study. - Complete analysis for high lift / high work study. - Reduce turbine stage /blade count. - Complete design of compressors and turbines for limited life and affordability, to enable embedded fan technologies. - Preliminary design review of embedded engine compressor fan module and hardware. - Continue demonstration of high efficiency, high durability propulsion components tailored for embedded systems.						

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025			
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 623066 / Turbine Engine Technology		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- Finalize manufacturing build parameters for turbines. - Continue engine component validated methodologies trade engine life, cost and performance - Finalize risk-based design system. - Complete systems engineering & digital engineering frameworks. - Multi-disciplinary design & optimization. - Continue development of predictive analysis tools to enable reliable, sufficiently durable component designs enable affordable mass for Autonomous Collaborative Platforms (ACP). - Rapid assessment of as manufactured parts. - Complete fan module component failure mode investigations. - Fan module testing. - Complete studies of bearings nonoil lubrication. - Design technologies for limited life systems. - Initiate new lubrication function higher temperature turbine engine mechanical systems. - Technology development studies for disruptive propulsion for future platforms. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 change - administrative transfer of work and funding to system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation of work to Mission Optimized Air Breathing Propulsion Technology Development (details below): FY 2026 increased compared to FY 2025 by \$41.533 million: - \$39.056 million increase due to: - Transfer of work and \$26.339 million from Turbine Engine Components and - Transfer of work and \$7.872 million from Engine Technologies for Autonomous Vehicles and Munitions - Transfer of work and \$4.845 million transfer from Lubricant Technologies						

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025			
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 623066 / Turbine Engine Technology		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- \$2.477 million increase due increased emphasis in propulsion studies to enhance autonomous collaborative capabilities, designs including embedded fan, and initiation of work to reduce overall time required for engine development and design cycle to enable cost effective rapidly produced capabilities: - \$0.553 million transfer from Turboshaft/Turboprop and Small Turbofan Engine Technologies effort; - \$3.133 million transfer from Bearing Technologies effort; and - \$1.209 million decrease in 623066 Turbine Engine Technology project due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency.						
Title: Revolutionary Propulsion Technology Development Description: Investigation of air breathing propulsion technology to enable rapid development of future, revolutionary, and high-speed propulsion systems and concepts. FY 2026 change - due to administrative transfer of work and funding into system level thrusts versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work. In FY 2026 effort "Revolutionary Propulsion Technology" is retitled "Revolutionary Propulsion Technology Development" FY 2025 Plans: FY 2025 work and \$18.587 million Revolutionary Propulsion Technology effort: - Continue evaluation of integration of advanced augmentors and ramburner. - Complete exploration of new expendable and affordable architectures. - Complete the development and evaluation of advanced, integrated propulsion technologies for supersonic expendable, affordable, and reusable strike and Intelligence, Surveillance, and Reconnaissance (ISR) systems. - Continue studies for exploration of advanced propulsion technologies. - Continue studies in hypersonic combined cycles. - Initiate operational benefits and military utility analysis of air breathing propulsion technologies. FY 2025 work and \$7.302 million transfer from Engine Technologies for Autonomous Vehicles and Munitions effort: - Initiate studies in reducing the overall time required for engine development and design cycle. FY 2026 Base Plans:		17.413	18.587	30.271	-	30.271

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025				
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies	Project (Number/Name) 623066 / Turbine Engine Technology				
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- Complete evaluation of advanced augmentors. - Continue evaluation and integration of ramburners rotating detonation engine (RDE) technology - Fabricate and test RDE with a subsonic inlet diffuser to assess inlet distortion on integrated performance; - Design, fabricate and test RDE instrumented for quantification of the vibrational environment; - Demonstrate of staged fuel/air RDE injector at scale and relevant conditions; and - Design, fabricate and test of actuated nozzle assembly coupled to scale RDE operated in a water-cooled thermal management arrangement. - Complete studies for exploration of advanced propulsion technologies. - Studies enable initial cycle study on convertible engine. - Complete studies in hypersonic combined cycles. - Complete analysis of Air Breathing Propulsion Technologies. - Operational benefits and military utility - Continue studies in reducing the overall time required for engine development and design cycle a more responsive design times - Review relevant digital engineering methods identified in the detailed research plan - Conceptual design modifications to commercial off the shelf engines for military application. - Initiate and complete report detailing high cross wind inlet distortion patterns. - Design for vertical lift fan sub-system for high-speed vertical take-off and landing (HSVTOL). - Initiate fan tip generator configuration in future platforms. - Experimental characterization of disruptive propulsion. - Initiate and complete Detailed Design Review of external bearing turbine engines for disruptive propulsion for future platforms.							

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 623066 / Turbine Engine Technology	
B. Accomplishments/Planned Programs (\$ in Millions)					
	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- Initiate and complete rig testing to advance development of flight ready high-speed engine components. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 change - administrative transfer of work and funding to system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation of work to Revolutionary Propulsion Technology Development (details below): FY 2026 increased compared to FY 2025 by \$11.684 million: - \$7.302 million increase due to: - Transfer of work and \$7.302 million from Engine Technologies for Autonomous Vehicles and Munitions effort. - \$4.382 million increase due to increased emphasis in ramburner integration of rotating detonation technologies and testing flight ready high-speed engine components: - \$2.085 million from Combustion Technologies effort; - \$0.215 million from Diagnostic Technologies effort; and - \$2.082 million increase in 623066 Turbine Engine Technology project.					
Title: Turbine Engine Components Description: Develop core turbofan/turbojet engine components (i.e., compressors, and turbines) for strike and air superiority capabilities FY 2026 change - due to administrative transfer of work and funding into system level thrusts versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work. FY 2025 Plans: - Continue development of improved aerodynamic design tools and analysis methods to extend engine operability and efficiency by advancing rules and tools to perform integrated engine design to meet modeling, simulation, and analysis defined capabilities. - Continue transonic fan distortion tolerance and transfer study to enable design-for-integration and reliable assessment for embedded engines by advancing design activities for distortion tolerant fan components. - Continue high lift /high work turbine study to reduce turbine stage /blade count. - Continue design of compressors and turbines for limited life and affordability. - Initiate demonstration of high efficiency, high durability propulsion components tailored for embedded systems.					
	24.675	26.339	0.000	-	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025				
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies	Project (Number/Name) 623066 / Turbine Engine Technology				
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- Initiate engine component validated methodologies to trade engine life, cost and performance.							
FY 2026 Base Plans: Transfer of work and funds of \$26.339 million to Mission Optimized Air Breathing Propulsion Technology Development effort.							
FY 2025 to FY 2026 Increase/Decrease Statement: FY2026 decreased compared to FY 2025 by \$26.339 million due to administrative transfer of work and funding to system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation of work to the Mission Optimized Air Breathing Propulsion Technology Development effort.							
Title: Turboshaft/Turboprop and Turbofan Engine Technologies			4.587	0.553	0.000	-	0.000
Description: Develop components for turboshaft/turboprop and small turbofan engines for trainers, special operations aircraft, and long-range strike.							
FY 2026 change - due to administrative transfer of work and funding into system level thrusts versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work.							
FY 2025 Plans: - Complete exploration of new small engine technologies that can operate in high-speed applications. - Complete exploration of new small and medium size engine technologies for increased fuel efficiency, propulsive capability, power and thermal management, and reduced life cycle cost. - Complete identification of new architectures and critical technologies for integrated power and thermal systems. - Complete identification of requirements and develop models for simulation of highly integrated systems.							
FY 2026 Base Plans: Turboshaft/Turboprop and Turbine Engine Technologies completed in FY2025.							
FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$0.553 million due to administrative transfer of work and funding into system level thrusts versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work due to increased emphasis in Mission Optimized Air Breathing Propulsion Technology Development effort.							
Title: Engine Technologies for Autonomous Vehicles and Munitions			13.667	15.174	0.000	-	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025					
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 623066 / Turbine Engine Technology				
B. Accomplishments/Planned Programs (\$ in Millions)				FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Description: Develop methodologies to design low cost and limited life engine components for autonomous vehicles and munitions. FY 2026 change - due to administrative transfer of work and funding into system level thrusts versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work. FY 2025 Plans: - Complete evaluation of power and thermal modeling of advanced architectures into aircraft system level multidisciplinary analysis and optimization tools: explore new control methods for integrated propulsion, power, and thermal management. - Complete exploration of new expendable and affordable architectures. - Complete exploration of new engine concepts for missile and unmanned systems. - Complete lifetime demonstration of limited life engine components. - Continue multi-disciplinary design & optimization, systems engineering & digital engineering frameworks. - Continue development of predictive analysis tools to enable reliable, sufficiently durable component designs for Autonomous Collaborative Platforms (ACP). - Initiate component failure mode investigations. - Initiate studies in reducing the overall time required for engine development and design cycle. FY 2026 Base Plans: Transferred work and funds to: \$7.872 million to Revolutionary Propulsion Technology Development and \$7.302 million to Mission Optimized Air Breathing Propulsion Technology Development FY 2025 to FY 2026 Increase/Decrease Statement:								

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025					
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 623066 / Turbine Engine Technology				
B. Accomplishments/Planned Programs (\$ in Millions)				FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
FY 2026 decreased compared to FY2025 by \$15.174 million due to administrative transfer of work and funding to system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation of work: - Transfer of work and \$7.872 million to Mission Optimized Air Breathing Propulsion Technology Development; and - Transfer of work and \$7.302 million to Revolutionary Propulsion Technology Development efforts.								
Title: Combustion Technologies Description: Develop, test, and evaluate revolutionary combustion and propulsion concepts for gas turbine, pulse detonation, and combined cycle engines for missiles, limited life systems. FY 2026 change - due to administrative transfer of work and funding into system level thrusts versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work. FY 2025 Plans: - Complete the development and demonstration of new design, modeling and simulation and testing methods to improve efficiency and operability. - Complete investigation to identify and assess disruptive propulsion/power concepts and evaluate concepts. - Complete development of new technologies for unmanned aircraft system propulsion/power systems for improved understanding at relevant operating conditions. - Complete exploration of applied high speed combustion and combustor design. - Complete exploration of rotating detonation engines for next generation combustion systems. - Complete the development of improved numerical methods and combustion models to guide design and applied development of combustion components and systems. FY 2026 Base Plans: Combustion Technologies completed in FY 2025. FY 2025 to FY 2026 Increase/Decrease Statement:				4.840	2.085	0.000	-	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 623066 / Turbine Engine Technology	
B. Accomplishments/Planned Programs (\$ in Millions)					
	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
FY 2026 decreased compared to FY 2025 by \$2.085 million due to administrative transfer of work and funding into system level thrusts versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work to Revolutionary Propulsion Technology Development effort.					
Title: Diagnostic Technologies					
Description: Develop and demonstrate optical, electromechanical, and laser diagnostic tools and sensors for application to revolutionary propulsion technologies.					
FY 2026 change - due to administrative transfer of work and funding into system level thrusts versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work.					
FY 2025 Plans: - Complete the application of optical diagnostic to challenging engine environments including detonations, high pressures, and multiphase.					
FY 2026 Base Plans: - Diagnostic Technologies effort completed in FY 2025.					
FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$0.215 million due to administrative transfer into system level thrusts versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work to Revolutionary Propulsion Technology Development effort due to decreased emphasis in diagnostic tools and sensors research in Diagnostic Technologies effort.					
Title: Bearing Technologies					
Description: Develop and test advanced bearing material technology and bearing concepts for small, intermediate, and large- scale turbine engine applications.					
FY 2026 change - due to administrative transfer of work and funding into system level thrusts versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work.					
FY 2025 Plans: - Complete development of oil-free bearing technology for Unmanned Air Systems.					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025			
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 623066 / Turbine Engine Technology		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- Complete the development and demonstration of propulsion technologies for subsonic expendable and attritable air platforms, small and medium scale propulsion technologies, and evaluate lubricants, mechanical systems, bearing technology and combustion concepts for advanced turbine engines. - Complete the development of fundamental knowledge of bearing material rolling contact fatigue failure mechanisms and lubricant interactions through microstructural investigations and failure analysis. FY 2026 Base Plans: - Bearing Technologies effort completed in FY 2025 FY 2025 to FY 2026 Increase/Decrease Statement: - FY 2026 decreased compared to FY 2025 by \$3.133 million due to administrative transfer of work and funding into system level thrusts versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work to Mission Optimized Air Breathing Propulsion Technology Development effort due to decreased emphasis in turbine engine bearings research in Bearing Technologies effort.						
Title: Lubricant Technologies Description: This project evaluates lubricants, for advanced turbine engines, and combined cycle engines with emphasis on low cost and high-speed applications. FY 2026 change - due to administrative transfer of work and funding into system level thrusts versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work. FY 2025 Plans: - Complete the development of lubricant modeling through characterization of heat generation, lubrication system cooling effectiveness, failure progression of bearing materials under relevant engine conditions, and overall system performance of advanced bearing concepts for model validation. - Complete performance validation study of lubricant & lubrication system components via full-scale high-fidelity laboratory parametric testing at representative engine operating conditions.		0.000	4.845	0.000	-	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602203F / <i>Aerospace Systems Technologies</i>	Project (Number/Name) 623066 / <i>Turbine Engine Technology</i>			
B. Accomplishments/Planned Programs (\$ in Millions)					
	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- Complete development of applied rotor dynamics models for design.					
- Continue studies on bearings nonoil lubrication technologies for limited life systems.					
FY 2026 Base Plans: Transfer of work and funds to Revolutionary Propulsion Technology Development effort.					
FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$4.845 million due to administrative transfer of work and funding to system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation of work in Mission Optimized Air Breathing Propulsion Technology Development effort.					
Accomplishments/Planned Programs Subtotals	68.887	70.931	71.804	-	71.804
	FY 2024	FY 2025			
Congressional Add: Program Increase - Low-Cost Small Turbine Engine	12.193	-			
FY 2024 Accomplishments: Conduct Congressionally directed efforts.					
Congressional Adds Subtotals	12.193	-			
C. Other Program Funding Summary (\$ in Millions) N/A					
Remarks					
D. Acquisition Strategy Not applicable.					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies				Project (Number/Name) 623145 / Aerospace Power Technology			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
623145: Aerospace Power Technology	0.000	70.537	38.640	0.000	0.000	0.000	-	-	-	-	-	-
A. Mission Description and Budget Item Justification												
This project develops integrated electrical and thermal management components, controls and systems for military aerospace applications. Power component technologies are developed to increase reliability, maintainability, commonality, affordability, and supportability of aircraft and flight line equipment. Research is conducted in energy storage and hybrid power system technologies to enable special purpose applications. Electrical power and thermal management technologies enable future military power and thermal needs. Controls and system integration technologies ensure the interoperability of aircraft, power, thermal, engine and other systems and subsystems. This project supports development of electrical power and thermal management components, controls and systems suitable for applications to legacy and future aircraft platforms including strike and mobility concepts. Lightweight power systems suitable for other aerospace applications are also developed.												
FY 2026 change - due to administrative transfer of work and funding (\$38.640 million) from 623145 Aerospace Power Technology Project to 622403, Aerospace Power & Flight Control Technology project for system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation of work.												
B. Accomplishments/Planned Programs (\$ in Millions)							FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	
Title: High Power Systems Technology							36.399	38.640	0.000	-	0.000	
Description: Develop integrated system architecture, controls, and component technologies to provide for the large amounts of electrical power needed, and concurrent thermal mitigation required, by current and future manned and unmanned systems. Address the challenges imposed by the decreased volume, surface area, airflow, etc. of Autonomous Collaborative Platforms relative to current combat aircraft.												
FY 2025 Plans:												
- Continue testing of subsystems hardware in conjunction with continued platform level tip-to-tail modeling and simulation for energy optimization including update of Digital System Model for government subsystem architecture for autonomous collaborative platforms to provide sharable power and thermal model baseline for industry and government use.												
- Continue medium-scale propulsion, power and thermal system studies and development to include innovative, integrated hybrid architectures including medium scale vapor cycle systems to provide greater thermal capacity to autonomous collaborative platforms.												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025			
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 623145 / Aerospace Power Technology		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- Continue development of advanced power and thermal capabilities for future hypersonic aircraft including power generation prototypes for high-temperature long-endurance missions to enable new platform capabilities. - Continue development of adaptive, affordable power and thermal technologies for emerging medium-scale platforms and mission capabilities including hardware-in-the-loop evaluation of electric flight control actuators to provide cost effective electric architectures and validated digital models. - Continue development of advanced vehicle energy management capabilities including modeling and analysis of path planning for energy management on autonomous collaborative platforms to provide benefits assessment, such as for extended range. FY 2026 Base Plans: FY 2026 change - due to administrative transfer of work and funding to system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation of work. - 0602203F Aerospace Systems Technologies (FY 2025 Aerospace Propulsion), 623145 Advanced Propulsion Technology project, High Power Systems Technology effort is transferred to 622403 Aerospace Power & Flight Control Technology project, Power and Thermal Management Technology Development effort. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$38.640 million due to administrative transfer of work and funding from 623145 Advanced Propulsion Technology project, High Power Systems Technology effort to 622403 Aerospace Power & Flight Control Technology project, Power and Thermal Management Technology Development effort for system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation of work.						
Accomplishments/Planned Programs Subtotals		36.399	38.640	0.000	-	0.000
		FY 2024	FY 2025			
Congressional Add: Program Increase: Rotary Machines with Advanced Magnetic Materials		9.754	-			
FY 2024 Accomplishments: Conduct Congressionally directed efforts.						
Congressional Add: Program Increase: Highly Electrified Aircraft		4.877	-			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602203F / <i>Aerospace Systems Technologies</i>	Project (Number/Name) 623145 / <i>Aerospace Power Technology</i>	
		FY 2024	FY 2025
FY 2024 Accomplishments: Conduct Congressionally directed efforts.			
Congressional Add: Program Increase - Emergency Power and Cooling Thermal Management Growth		9.754	-
FY 2024 Accomplishments: Conduct Congressionally directed efforts.			
Congressional Add: Program Increase: High Voltage Aircraft Power		1.950	-
FY 2024 Accomplishments: Conduct Congressionally directed efforts.			
Congressional Add: Program Increase: Improving Reliability of Electrical Systems for Future Aircraft		2.926	-
FY 2024 Accomplishments: Conduct Congressionally directed efforts.			
Congressional Add: Program increase - Battery Additives		4.877	-
FY 2024 Accomplishments: Conduct Congressionally directed efforts. Internal realignment to Program 0602605F, Project 625173.			
Congressional Adds Subtotals		34.138	-
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
FY 2026 change - due to administrative transfer of work and funding (\$38.640 million) from 623145 Aerospace Power Technology project to 622403 Aerospace Power & Flight Control Technology project for system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation of work.			
D. Acquisition Strategy			
Not applicable.			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies				Project (Number/Name) 625171 / Missile Rocket Propulsion			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
625171: Missile Rocket Propulsion	0.000	37.095	36.945	34.426	0.000	34.426	-	-	-	-	-	-
A. Mission Description and Budget Item Justification												
This project develops rocket propulsion technologies for the design, development, and fabrication of strategic systems (including solid boost/missile motors, post boost control, aging and surveillance efforts), and tactical missiles. Analytical and experimental areas of emphasis are propellants, propellant management, combustion, rocket material applications, model-based system engineering, digital design of manufacture and test, test stand live-fire testing, and technology for sustainment of strategic systems. This project develops the next generation of physics-based Modeling, Simulation, and Analysis (MS&A) tools for rapid and agile missile propulsion design, analysis, and production, as well as the digital engineering concepts to manage the entire process of design, test, and validation of solid rocket motors through live-fire tests. All efforts in this project contribute to the sustainment of the rocket propulsion industry, providing rocket propulsion technology for the entire DoD. All efforts are reviewed by a DoD level steering committee yearly for relevance to DoD missions.												
B. Accomplishments/Planned Programs (\$ in Millions)							FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	
Title: Missile Propulsion Technology Development							0.000	0.000	34.426	-	34.426	
Description: Develop, characterize, and test advanced fuels, energetics, solid propellants, formulations, and their ingredients to increase missile launch vehicles and refine new synthesis methodologies. Development of propellant management devices in support of fabrication and fuel delivery. Develop and demonstrate missile propulsion technologies for ballistic and tactical missile applications. Research leads to digital design and test with novel manufacturing processes to support national defense needs for performance, effectiveness, and industrial manufacturing capability for missile propulsion.												
FY 2026 change - due to administrative transfer of work and funding to system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation transfer of work.												
FY 2025 Plans: FY 2026 administrative transfer of FY 2025 work of \$10.852 million from Missile Propellant Research effort: - Continue to devise, synthesize, scale-up, test, and characterize novel energetic ingredients for monopropellants, fuels, and oxidizers, for use in DAF and missile applications including tactical and strategic applications.												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025				
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies	Project (Number/Name) 625171 / Missile Rocket Propulsion				
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- Continue to formulate, scale-up, test, and evaluate formulations of solid and liquid rocket propellants, including green monopropellants. - Continue to identify, evaluate, and adapt 21st century automated formulation and production techniques to enable more rapid and agile munitions. - Continue research in high-temperature resins, insulators, and composite case fabrication techniques to enable high performance rocket motor cases. FY 2026 administrative transfer of FY 2025 work of \$26.093 million from Ballistic and Tactical Propulsion Technology effort: - Continue to apply next generation of chemical and mechanical aging mechanism modeling, simulation, and analysis tools, sensor schemes and tools, to user needs and unique challenges. - Continue to develop advanced tactical propulsion hardware and concepts. - Continue development, evaluation, verification, and validation of next generation of physics-based modeling, simulation, and analysis tools for rapid and agile missile propulsion design, analysis, and production to include designs for 21st century material processing techniques and hardware. - Continue to support advanced component technologies for missile propulsion applications for strategic and strike systems helping to ensure their long-term sustainment. - Continue automated solid rocket motor production techniques and components to enable more rapid and agile munitions production and logistic support. FY 2026 Base Plans: - Continue to devise, synthesize, scale-up, test, and characterize novel energetic ingredients for efficient propulsion capabilities for solid rocket motors, rocket engines and related propulsion systems; -Activities include demonstration of propellant micro-reactors, binder testing for printed applications, and tactical-size motor hotfires to demonstrate integrated components. - Continue to evaluate solid and liquid rocket propellants for propulsion capabilities for DoD;							

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025					
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 625171 / Missile Rocket Propulsion				
B. Accomplishments/Planned Programs (\$ in Millions)				FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
-Activities include applied chemical formulation, scale-up, and testing. - Continue to identify, evaluate, and adapt 21st century automated formulation and production techniques to enable more rapid and agile munitions; -Activities include development of new chemical binder and energetic material for three-dimensional printing. - Continue research in high-temperature resins, insulators, and composite case fabrication techniques to enable high performance rocket motor cases; -Activities include testing of grain-wound carbon fiber motor case. - Continue to apply the next generation of chemical and mechanical aging mechanism Modeling Simulation and Analysis (MS&A) tools supporting weapon lifetimes and fleet reliability; -Activities include service life evaluation support for weapon systems. - Continue the development of advanced tactical propulsion hardware for efficient propulsion capabilities for solid rocket motors, rocket engines and related propulsion systems; -Activities include support of flight demonstration tests of solid rocket motors. - Continue the development, evaluation, verification, and validation of next generation of physics-based MS&A tools to enable rapid and agile missile propulsion design, analysis, and production; -Activities include digital performance evaluations supporting hotfire tests. - Continue to support the advanced component technologies for missile propulsion applications supporting development of strategic and strike systems; -Activities include propellant testing and silo firing calculations. - Continue automated solid rocket motor production techniques and components to enable more rapid and agile munitions production and logistic support. -Activities include evaluation and validation of on-site solid rocket motor material testing. FY 2025 to FY 2026 Increase/Decrease Statement:								

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025				
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies	Project (Number/Name) 625171 / Missile Rocket Propulsion				
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
FY 2026 change - due to administrative transfer of work and funding to system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation of work to Missile Propulsion Technology Development (details below).							
FY 2026 increased compared to FY 2025 by \$34.426 million due to transfer of work and funding of: - \$10.852 million from Missile Propellant Research and - \$26.093 million from Ballistic and Tactical Propulsion Technologies efforts; and - \$2.519 million decrease to the Missile Rocket Propulsion Technology project due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency.							
Title: Missile Propellant Research Description: Develop, characterize, and test advanced fuels, energetics, solid propellants, formulations, and their ingredients to increase missile launch vehicles and refine new synthesis methodologies. Development of propellant management devices in support of fabrication and fuel delivery. FY 2026 change - due to administrative transfer of work and funding to system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation transfer of work to Missile Propulsion Technology Development effort. FY 2025 Plans: - Continue to devise, synthesize, scale-up, test, and characterize novel energetic ingredients for monopropellants, fuels, and oxidizers, for use in DAF and missile applications including tactical and strategic applications. - Continue to formulate, scale-up, test, and evaluate formulations of solid and liquid rocket propellants, including green monopropellants. - Continue to identify, evaluate, and adapt 21st century automated formulation and production techniques to enable more rapid and agile munitions.			10.875	10.852	0.000	-	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025					
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 625171 / Missile Rocket Propulsion				
B. Accomplishments/Planned Programs (\$ in Millions)				FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- Continue research in high- temperature resins, insulators, and composite case fabrication techniques to enable high performance rocket motor cases. FY 2026 Base Plans: Transfer of work and fundings Missile Propulsion Technology Development effort. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$10.852 million due to administrative transfer of work and funding to system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation of work to Missile Propulsion Technology Development effort.								
Title: Ballistic and Tactical Propulsion Technologies Description: Develop and demonstrate missile propulsion technologies for ballistic and tactical missile applications. Research develops digital design and test with novel manufacturing processes to support national defense needs for performance, effectiveness, and industrial manufacturing capability for missile propulsion. FY 2026 change - due to administrative transfer of work and funding to system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation transfer of work. FY 2025 Plans: - Continue to apply next generation of chemical and mechanical aging mechanism Modeling, Simulation, and Analysis tools, sensor schemes and tools, to user needs and unique challenges. - Continue to develop advanced tactical propulsion hardware and concepts. - Continue development, evaluation, verification, and validation of next generation of physics-based modeling, simulation, and analysis tools for rapid and agile missile propulsion design, analysis, and production to include designs for 21st century material processing techniques and hardware. - Continue to support advanced component technologies for missile propulsion applications for strategic and strike systems helping to ensure their long-term sustainment.				26.220	26.093	0.000	-	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force				Date: June 2025		
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / <i>Aerospace Systems Technologies</i>		Project (Number/Name) 625171 / <i>Missile Rocket Propulsion</i>		
B. Accomplishments/Planned Programs (\$ in Millions)						
		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- Continue automated solid rocket motor production techniques and components to enable more rapid and agile munitions production and logistic support. <i>FY 2026 Base Plans:</i> Transfer of work and fundings Missile Propulsion Technology Development effort. <i>FY 2025 to FY 2026 Increase/Decrease Statement:</i> FY 2026 decreased compared to FY 2025 by \$26.093 million due to administrative transfer of work and funding to system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation of work to Missile Propulsion Technology Development effort.						
Accomplishments/Planned Programs Subtotals		37.095	36.945	34.426	-	34.426
C. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						
D. Acquisition Strategy						
Not applicable						

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies				Project (Number/Name) 625330 / Aerospace Fuel Technology			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
625330: Aerospace Fuel Technology	0.000	8.525	5.443	8.534	0.000	8.534	-	-	-	-	-	-
A. Mission Description and Budget Item Justification												
This project evaluates fuels for advanced turbine engines, scramjets, detonation, and combined cycle engines. This project also considers fuel related concepts that can increase turbine engine operational reliability, durability, mission flexibility, energy efficiency, and performance while reducing weight, fuel consumption, and cost of ownership. Applications include autonomous collaborative platforms, munitions, and high-speed systems (to include hypersonics). Research areas of emphasis include evaluations of fuel properties and characteristics of traditional, specialty, and alternative fuels developed from unconventional sources.												
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Title: Aerospace Fuel Technology Development								0.000	0.000	8.534	-	8.534
Description: Investigating fuel for use in air breathing propulsion technologies in higher speed and temperature application for higher speed and temperature applications.												
FY 2026 change - due to administrative transfer of work and funding to system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation of work.												
FY 2025 Plans:												
FY 2026 administrative transfer of FY 2025 work of \$0.694 million from Alternative Fuels effort:												
- Initiate research in developing tools to understand fuel composition, focusing on non-drop-in fuels												
FY 2026 administrative transfer of FY 2025 work of \$3.099 million from Integrated Thermal and Energy Management effort:												
- Continue investigation of fuel heat sink approaches for thermal management, model fuel molecular interactions												
- Continue development of sensors and analysis techniques for monitoring fuel chemistry that causes deposits												
- Initiate development of fuel formulations for high-speed applications												
FY 2026 administrative transfer of FY 2025 work of \$1.580 million from Fuel Logistics and Sustainment effort:												
- Initiate research in converting military waste such as hydraulic fluids and engine oil to fuel or fuel components.												
FY 2026 Base Plans:												
- Continue research in developing tools to understand fuel composition for decision making on non-drop-in fuels.												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force				Date: June 2025		
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 625330 / Aerospace Fuel Technology		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- Fuel property and performance model development. - Continue investigation of fuel heat sink approaches for thermal management of fuel deposition modeling - Advance model by capturing performance data. - Continue development of sensors and analysis techniques for monitoring fuel chemistry that causes deposits - Test real-time coking sensor on fuel system simulator. - Continue development of fuel formulations for fuel for high-speed applications - Identify endothermic fuel candidates for scale up to test on deposition screening. - Complete research in converting military waste such as hydraulic fluids and engine oil to fuel or fuel components. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$8.534 million due administrative transfer of work and funding to system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation of work to Aerospace Fuel Technology Development (details below): - Transfer of plans and funding of \$0.694 million from Alternative Fuels; - Transfer of plans and funding of \$3.099 million from Integrated Thermal and Energy Management; - Transfer of plans and funding of \$1.580 million from Fuel Logistics & Sustainment; - Increase of \$3.091 million in Aerospace Fuel Technology project due to emphasis in technology maturation efforts for digital tools advancing in phase.						
Title: Alternative Fuels		0.694	0.694	0.000	-	0.000
Description: Investigate novel sustainable aviation fuels for engines, missiles, aircraft, sustained high-speed vehicles, hypersonic, and responsive space launch applications. Conduct evaluations and perform technical assessments of alternative fuels developed from unconventional sources for use in legacy and advanced aerospace systems. Support development of alternative fuel specification for commercial jet fuels with Federal Aviation Agency.						
FY 2026 change - due to administrative transfer of work and funding to system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation of work.						

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies		Project (Number/Name) 625330 / Aerospace Fuel Technology	
B. Accomplishments/Planned Programs (\$ in Millions)					
	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
FY 2025 Plans: - Complete investigation of novel sustainable and alternative aviation fuels and technologies for potential propulsion performance and logistical enhancements. - Initiate research in developing tools to understand fuel composition, focusing on non-drop-in fuels.					
FY 2026 Base Plans: - Transfer of plans and fundings of \$0.694 million to Aerospace Fuel Technology Development effort.					
FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$0.694 million due to administrative transfer of work and funding to system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation of work to Aerospace Fuels Technology Development effort.					
Title: Integrated Thermal and Energy Management					
Description: Investigate and evaluate stability and performance of advanced and specialty fuels for air breathing propulsion systems. FY 2026 change - due to administrative transfer of work and funding to system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation of work.					
FY 2025 Plans: - Complete the development and evaluation of novel fuel additives, catalysts, compositions, and system approaches enabling new hypersonic applications and expanding into other advance concepts and system-level impacts of emerging aviation technologies. - Continue investigation of fuel heat sink approaches for thermal management, model fuel molecular interactions - Complete development of fuel models for system design and evaluation of fuel system. - Continue development of sensors and analysis techniques for monitoring fuel chemistry that causes deposits. - Complete development of integrated test rigs to tests these approaches and assess their efficiency.					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025				
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / Aerospace Systems Technologies	Project (Number/Name) 625330 / Aerospace Fuel Technology				
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
- Initiate development of fuel formulations for high-speed applications. FY 2026 Base Plans: - Transfer of plans and funding of \$3.099 million to Aerospace Fuel Technology Development effort. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$3.099 million due to administrative transfer of work and funding to system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation of work to Aerospace Fuel Technology Development effort.							
Title: Fuel Logistics and Sustainment Description: Study and evaluate low-cost approaches to reduce fuel logistics footprint to reduce cost. Study fuel logistics vulnerabilities and develop detection and mitigation technologies. FY 2026 change - due to administrative transfer of work and funding to system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation of work. FY 2025 Plans: - Complete support of fuel sustainment issues as needed, to understand current needs and problems as well as work to find solutions. - Complete development of fuel compositional analyses methods that are verifiable across services and leverages a database of specification and extended compositional information to advance data visualization and analytics. - Complete method developments to capture fuel stability limiters to minimize logistics vulnerabilities; develop detection and mitigations for fuel biocontamination to support logistics readiness; and develop fuel-sensing technologies with coordination and collaboration across the government. - Initiate research in converting military waste such as hydraulic fluids and engine oil to fuel or fuel components. FY 2026 Base Plans: Transfer of plans and funding of \$1.580 million to Aerospace Fuel Technology Development effort. FY 2025 to FY 2026 Increase/Decrease Statement:			2.817	1.580	0.000	-	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force				Date: June 2025	
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602203F / <i>Aerospace Systems Technologies</i>		Project (Number/Name) 625330 / <i>Aerospace Fuel Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)					
	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
FY 2026 decreased compared to FY 2025 by \$1.580 million due to administrative transfer of work and funding to system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation of work transfer of plans and fundings to Aerospace Fuel Technology Development effort.					
Title: Combustion Emissions and Performance Description: Investigate novel sustainable aviation fuels for engines, missiles, aircraft, sustained high-speed vehicles, hypersonic, and responsive space launch applications. Conduct evaluations and perform technical assessments of alternative fuels developed from unconventional sources for use in legacy and advanced aerospace systems. Support development of alternative fuel specification for commercial jet fuels with Federal Aviation Agency. FY 2025 Plans: - Complete studies of impact on combustor performance and emissions based on fuel chemistry of sustainable aviation fuels. FY 2026 Base Plans: - Combustion Emissions and Performance completed in FY 2025. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$0.070 million due to administrative transfer of work and funding to system level thrusts versus component level to enable acceleration of integrated system capabilities and capture realistic representation of work to Aerospace Fuel Technology Development effort.	2.197	0.070	0.000	-	0.000
Accomplishments/Planned Programs Subtotals	8.525	5.443	8.534	-	8.534
C. Other Program Funding Summary (\$ in Millions) N/A					
Remarks					
D. Acquisition Strategy Not applicable.					

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research					R-1 Program Element (Number/Name) PE 0602204F I Aerospace Sensors							
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
Total Program Element	0.000	236.340	193.029	199.120	0.000	199.120	-	-	-	-	-	-
622002: Electronic Component Technology	0.000	64.129	50.392	53.672	0.000	53.672	-	-	-	-	-	-
622003: EO Sensors & Countermeasures Tech	0.000	25.549	25.965	0.000	0.000	0.000	-	-	-	-	-	-
622005: Cyber Technology	0.000	14.351	13.839	0.000	0.000	0.000	-	-	-	-	-	-
624920: Electronic Warfare Technology	0.000	39.929	40.981	38.103	0.000	38.103	-	-	-	-	-	-
626095: Sensor Fusion Technology	0.000	50.113	17.995	40.933	0.000	40.933	-	-	-	-	-	-
627622: RF Sensors and Countermeasures Tech	0.000	42.269	43.857	66.412	0.000	66.412	-	-	-	-	-	-
Note In FY 2026, within Program 0602204F, Aerospace Sensors, the technical work and funding in Project 622003, EO Sensors & Countermeasures Tech is being integrated into Project 627622, RF Sensors and Countermeasures Tech. In FY 2026, within Program 0602204F, Aerospace Sensors, the technical work and funding in Project 622005, Cyber Technology; Flexible and Secure Avionics Effort, is being integrated into the following: Project 624920, Electronic Warfare Technology; Radio Frequency Electronic Warfare Technologies Effort (\$2.353 million) and Project 627622, RF Sensors and Countermeasures Tech; Multiband Multifunction Radio Frequency Sensing Effort (\$5.301 million) and Distributed Radio Frequency Sensing Effort (\$6.480 million). A. Mission Description and Budget Item Justification The Air Force Research Laboratory (AFRL) is focused on high-impact, multi-domain science & technology (S&T) solutions that drive innovation now while laying the groundwork for the Air and Space Force to win the future fight. AFRL effectively synchronizes the Department of the Air Force (DAF) S&T enterprise and workforce to align towards the most consequential DAF priorities and accelerate the delivery of game-changing S&T. This program develops the technology base for Air Force aerospace sensors and electromagnetic combat. Advances in aerospace sensors are required to increase combat effectiveness by providing anytime, anywhere surveillance, reconnaissance, precision targeting, and electromagnetic warfare capabilities. To achieve this progress, this program pursues simultaneous advances in: 1) generating, controlling, receiving, and processing electronic and photonic signals for radio frequency sensor aerospace applications; 2) affordable, reliable, all weather radio frequency and electro-optical/infrared countermeasure concepts; 3) positioning, navigation												

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force				Date: June 2025		
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research		R-1 Program Element (Number/Name) PE 0602204F I Aerospace Sensors				
and timing integrity, accuracy, and resiliency; 4)electro-optical and infrared aerospace sensor technologies for a variety of offensive and defensive uses; 5) radio frequency antennas and associated electronics for airborne and space surveillance, together with active and passive electro-optical/infrared sensors; 6) technologies to manage and fuse on-board sensor information for timely, comprehensive situational awareness; 7) technology for affordable, trusted, resilient, and reliable, all-weather surveillance, reconnaissance, and precision strike radio frequency sensors and electronic combat systems; and 8) technologies that aid in the development of agile and resilient mission systems. This program has been coordinated through the Department of Defense Science and Technology Executive Committee process to harmonize efforts and eliminate duplication.						
Funds in this program element may be used to investigate specified technology advancements in multiple domains.						
This program element may include necessary expenses to support the operation and maintenance of facilities to manage, execute, and deliver science and technology capabilities.						
This program includes funding for the requisite DAF Science & Engineering and mission enabling civilian workforce with the necessary technical competencies to develop, manage, and deliver science & technology capabilities. The use of program funds in this program element is in conjunction with the civilian pay expenses budgeted in the following program elements: 1206601SF, 0601102F, 0602020F, 0602102F, 0602202F, 0602203F, 0602298F, 0602336F, 0602602F, 0602605F, 0602788F, and 0603680F. In FY 2026, \$106.756 million is budgeted in this program for 535 direct Full-Time Equivalent civilians. The Air Force Research Laboratory utilizes 10 USC 4091, "Authorities for certain positions at science and technology reinvention laboratories" to manage the workforce strength, structure, positions, and compensation.						
This program is in Budget Activity 2, Applied Research because this budget activity includes studies, investigations, and non-system specific technology efforts directed toward general military needs with a view toward developing and evaluating the feasibility and practicality of proposed solutions and determining their parameters.						
B. Program Change Summary (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Previous President's Budget		216.269	193.029	193.065	0.000	193.065
Current President's Budget		236.340	193.029	199.120	0.000	199.120
Total Adjustments		20.071	0.000	6.055	0.000	6.055
• Congressional General Reductions		0.000	0.000			
• Congressional Directed Reductions		0.000	0.000			
• Congressional Rescissions		0.000	0.000			
• Congressional Adds		32.000	0.000			
• Congressional Directed Transfers		0.000	0.000			
• Reprogrammings		-0.004	0.000			
• SBIR/STTR Transfer		-3.274	0.000			
• Other Adjustments		-8.651	0.000	6.055	0.000	6.055

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research</i>		R-1 Program Element (Number/Name) PE 0602204F / <i>Aerospace Sensors</i>	
Congressional Add Details (\$ in Millions, and Includes General Reductions)		FY 2024	FY 2025
Project: 622002: <i>Electronic Component Technology</i>			
Congressional Add: <i>Program increase: Quantum optoelectronic materials and devices</i>		6.000	0.000
Congressional Add: <i>Program increase: Hardware and embedded systems security, assurance, and trust</i>		9.000	0.000
Congressional Add: <i>Program increase: Zero-trust environment for semiconductor technology</i>		2.000	0.000
Congressional Add Subtotals for Project: 622002		17.000	0.000
Project: 626095: <i>Sensor Fusion Technology</i>			
Congressional Add: <i>Cyber kinetic combat environment</i>		15.000	-
Congressional Add Subtotals for Project: 626095		15.000	-
Congressional Add Totals for all Projects		32.000	0.000
Change Summary Explanation In FY 2024, decrease of \$8.651 million in Other Adjustments was due to realignment of funds to PE 0602212F, Defense Laboratories R&D Projects, to implement the Department of Defense (DoD) Funding Laboratory Enhancements Across Four Categories (FLEX-4) authority under 10 U.S.C Section 4123. The FY 2026 budget request increased by a net \$6.055 million due to programmatic adjustments within the Science and Technology portfolio. The net increase is due to updated average work-year cost for civilian pay. Additional changes include: -- The FY 2026 request was reduced by \$12.056 million for civilian personnel to optimize the workforce in compliance with Executive Order 14210, "Implementing the President's Department of Government Efficiency Workforce Optimization Initiative." -- The FY 2026 request was reduced by \$7.881 million for programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency. -- The FY 2026 request was reduced by \$0.430 million for Advisory and Assistance Services to promote efficiencies and advance the policies of the Administration in alignment with Executive Order 14222, "Implementing the President's Department of Government Efficiency Cost Efficiency Initiative."			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602204F / Aerospace Sensors				Project (Number/Name) 622002 / Electronic Component Technology			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
622002: Electronic Component Technology	0.000	64.129	50.392	53.672	0.000	53.672	-	-	-	-	-	-
A. Mission Description and Budget Item Justification												
This project focuses on electronics and optoelectronics technologies that generate, control, receive, and process electromagnetic spectrum for aerospace sensor and electronic warfare applications. The enabling technologies developed under this project will be used for intelligence, surveillance, reconnaissance, electromagnetic warfare, battlespace access, and precision engagement capabilities. The technologies developed include exploratory electronic and optoelectronic devices, components, microsystems, and subsystems. This project also assesses designs, develops, fabricates, and demonstrates the associated technologies for integrating combinations of these component technologies. The project develops and demonstrates significantly smaller size, lower weight, lower cost, lower power dissipation, higher reliability, trustworthiness, and improved performance components. The device and subsystem technology developments under this project are military unique; they are based on Department of the Air Force and other Department of Defense weapon systems requirements in the areas of radar, communications, electromagnetic warfare, positioning, navigation, timing, and smart weapons.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2024	FY 2025	FY 2026	
Title: Sensor Subsystems									8.121	8.740	0.000	
Description: Develop, analyze, demonstrate, and perform engineering trade studies for technologies for compact, affordable, multi-function subsystems for aerospace sensors.												
FY 2025 Plans:												
- Continue research into autonomous low size, weight, and power sensor processing.												
- Continue research into digital at every element technology for multifunction microwave and millimeter wave arrays.												
- Continue development of low size weight and power wideband multifunction radio frequency sensor subsystem suitable for Group 4 uncrewed aircraft system operation.												
- Continue millimeter wave digital array demonstrations.												
- Continue wideband phased array emulation utilizing digital beamforming demonstrator.												
- Continue system build phase for multifunction wideband digital active electronically scanned array.												
FY 2026 Plans:												
In FY 2026 the funding and technical activities from this effort were realigned to Program Element 0602204F, Aerospace Sensors, 0602204F, Project Electronic Component Technology, 622002, Microelectronics Technology Development effort.												
FY 2025 to FY 2026 Increase/Decrease Statement:												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602204F / <i>Aerospace Sensors</i>	Project (Number/Name) 622002 / <i>Electronic Component Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
FY 2026 decreased compared to FY 2025 by \$8.740 million. This is a result of realignment of funding and technical activities from this project to Program 0602204F, Aerospace Sensors; Project 622002, Electronic Component Technology; Microelectronics Technology Development Effort.			
Title: Microelectronics Technology Development Description: Assess, research, develop, demonstrate, and transition microelectronics technologies from electronic components to sensor sub-systems that incorporate power efficient semiconductor technologies and highly integrated architectures to meet demand for decreased cost, size, and weight. Research, develop, and incorporate resilience and assurance capability into sensor sub-systems to enable revolutionary capabilities for the Department of the Air Force; and impede unwanted technology transfer and enable timely adoption of commercial and government-off-the-shelf microelectronic technologies. In FY 2026 Electronic Devices was renamed Microelectronics Technology Development. FY 2025 Plans: - Complete modeling efforts on integrated chip-level radio frequency device, power conversion modeling, and predictive analysis using higher order harmonics. - Continue development of wide bandgap device and power conversion integration technologies. - Continue demonstration of high efficiency microwave power modules with integrated high speed power conversion switching. - Continue development of high frequency characterization capability and evaluation of next generation wide bandgap radio frequency materials. - Initiate advanced wide-bandgap demonstration. FY 2026 Plans: • Continue modeling and technology development of electronic devices efforts in efficient radio frequency power amplifiers, efficient power conversion semiconductor technology, the characterization and evaluation of radio frequency and power semiconductor components, and technology demonstrations to facilitate transition to industry. Initiate research and development on electronic devices for extreme environments. • Continue development of chip-scale photonic/electronic wideband transceiver components with integrated advanced component and thermal management technologies for cost, size, weight and power constrained microwave and millimeter wave applications. • Continue research and development of resilient and assured radio frequency sensor sub-system prototypes incorporating hardware/software digital emulation, novel sensor processing, digital at every element technology for multifunction microwave and millimeter wave arrays, and digital beamformer technology advancements suitable for Group 4 uncrewed and attritable aircraft weapon systems. • Continue research and development of resilient and assured radio frequency sensor microelectronics prototypes by assessing modern threat capability, conducting reliability of complex integrated circuits, verifying and validating security techniques and methodologies for integrated circuit design, protecting critical microelectronics hardware against reverse engineering		7.907	8.427
			35.313

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602204F / Aerospace Sensors	Project (Number/Name) 622002 / <i>Electronic Component Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
and exploitation, and applying digital engineering and virtual prototyping to develop resilience and assurance techniques for microelectronic designs.			
<i>FY 2025 to FY 2026 Increase/Decrease Statement:</i> FY 2026 increased compared to FY 2025 by \$26.886 million. The increase is due to the realignment of funding and technical activities from the following efforts into this effort.			
- Program 0602204F, Aerospace Sensors; Project 622002, Electronic Component Technology; Sensors Subsystems Effort (\$8.740 million). - Program 0602204F, Aerospace Sensors; Project 622002, Electronic Component Technology; Trusted and Assured Electronics Effort (\$12.042 million). - Program 0602204F, Aerospace Sensors; Project 622002, Electronic Component Technology; Advanced Highly Integrated Microsystems for Intelligence, Surveillance, Reconnaissance and Electronic Warfare Effort (\$4.700 million).			
<i>Title:</i> Photonics Technology Development <i>Description:</i> Research, develop, demonstrate and transition photonic, electro-optical, and infrared components for next generation intelligence, surveillance, reconnaissance and countermeasures. In FY 2026 Photonic Components and Circuits was renamed Photonics Technology Development.		8.950	9.500
<i>FY 2025 Plans:</i> - Continue photonic and quantum substructure technology development. - Continue research into non-linear devices for tunability and power scaling - Continue development of high power, narrow line width lasers sources for advanced sensing and countermeasure applications. - Continue laser component packaging for laser detection and ranging. - Initiate development of chip-scale photonic/electronic wideband transceiver components. - Initiate resilient and assured optoelectronic/infrared and photonic analysis.			
<i>FY 2026 Plans:</i> - Continue photonic and quantum substructure technology development for quantum communications and remote sensing applications - Continue research into non-linear devices for tunability and power scaling relevant to infrared countermeasure development. - Continue development of high power, narrow line width lasers sources for advanced sensing and countermeasure applications. - Continue laser component packaging for laser detection and ranging. - Continue development of chip-scale photonic/electronic wideband transceiver components for electronic warfare technology development.			18.359

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602204F / Aerospace Sensors		Project (Number/Name) 622002 / Electronic Component Technology	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
- Continue resilient and assured optoelectronic/infrared and photonic analysis. - Initiate low-cost wafer-scale approaches for infrared detection and emission. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$8.859 million. The increase is due to the realignment of funding and technical activities from the following efforts into this effort. - Program 0602204, Aerospace Sensors; Project 622002, Electronic Component Technology; Trusted and Assured Electronics Effort (\$3.900 million). - Program 0602204F, Aerospace Sensors; Project 622002, Electronic Component Technology; Advanced Highly Integrated Microsystems for Intelligence, Surveillance, Reconnaissance and Electronic Warfare Effort (\$3.083 million).					
Title: Trusted and Assured Electronics Description: Investigate and develop designs of resilient and assured electronic systems that enable revolutionary capabilities for the Department of the Air Force, assure operational mission systems, and impede unwanted technology transfer thus enabling timely adoption and integration of commercial solutions with government-off-the-shelf microelectronic technologies. Areas of development include multi-function radio frequency and electro-optical subsystems, advanced electronic materials, on-board sensor processing, high-frequency power modules, and resilient, assured, and reliable electronics. FY 2025 Plans: - Continue development of prototype trustworthiness assessment capability and advanced exploitation tool development to assess modern threat capability. - Continue reliability assessments of advanced heterogeneously integrated microsystems. - Continue verification and validation of security techniques and methodologies for integrated circuit designs. - Continue disaggregated multi-chip System in Package demonstration using fine pitch for assurance. - Initiate application of digital engineering and virtual prototyping to develop resilience and assurance techniques for microelectronic designs. - Continue protective technology development for integration of commercial and government technologies for sensors and sensor systems to deter reverse engineering and exploitation of critical hardware and software to impede unwanted technology transfer, alteration of system capability, or development of countermeasures to our systems. FY 2026 Plans: In FY 2026 the funding and technical activities from this effort were realigned to Program Element 0602204F, Aerospace Sensors, Project 622002, Electronic Component Technology, Microelectronics Technology Development effort. FY 2025 to FY 2026 Increase/Decrease Statement:			10.081	15.942	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602204F / Aerospace Sensors	Project (Number/Name) 622002 / Electronic Component Technology	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
FY 2026 decreased compared to FY 2025 by 15.942 million. This is a result of realignment of funding and technical activities from this effort to the following efforts in Program 0602204F, Aerospace Sensors; Project 622002, Electronic Component Technology.			
- Microelectronics Technology Development Effort (12.042 million). - Photonics Technology Development Effort (3.900 million).			
Title: Advanced Highly Integrated Microsystems for Intelligence, Surveillance, Reconnaissance and Electronic Warfare Description: Perform research and development of electronic circuit and microsystem technologies focused on miniaturization, power reduction, reconfigurability and reduced cost. FY 2025 Plans: - Complete development of next generation reconfigurable transceiver. - Continue development of chip-scale photonic/electronic wideband transceiver components. - Complete identification of application areas and development of heterogeneous integration concepts. - Continue development of microsystem integration solutions that integrate advanced components and thermal management technologies for cost, size, weight and power constrained microwave and millimeter wave applications. FY 2026 Plans: In FY 2026 the funding and technical activities from this effort were realigned to Program Element 0602204F, Aerospace Sensors, Project 622002, Electronic Component Technology, Microelectronics Technology Development effort. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$7.783 million. This is a result of realignment of funding and technical activities from this effort to the following efforts in Program 0602204F, Aerospace Sensors; Project 622002, Electronic Component Technology. - Microelectronics Technology Development Effort (4.700 million). - Photonics Technology Development Effort (3.083 million).		7.148	7.783
Title: Microelectronics & Embedded System Assurance Description: Investigate and develop microelectronics security technologies to impede unwanted technology transfer and enable timely adoption of commercial and government-off-the-shelf microelectronic technologies that enable revolutionary capabilities for the Air Force. FY 2025 Plans:		4.922	0.000
		0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602204F / <i>Aerospace Sensors</i>	Project (Number/Name) 622002 / <i>Electronic Component Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
In FY 2025 funding from this effort was realigned to Program Element, 0602204F, Aerospace Sensors, Project 622002, Electronic Component Technology, Trusted and Assured Electronics effort.			
FY 2026 Plans: Not Applicable			
FY 2025 to FY 2026 Increase/Decrease Statement: Not Applicable			
Accomplishments/Planned Programs Subtotals		47.129	50.392
	FY 2024	FY 2025	
Congressional Add: Program increase: Quantum optoelectronic materials and devices	6.000	0.000	
FY 2024 Accomplishments: Conduct Congressional directed efforts			
FY 2025 Plans: Not Applicable			
Congressional Add: Program increase: Hardware and embedded systems security, assurance, and trust	9.000	0.000	
FY 2024 Accomplishments: Conduct Congressional directed efforts			
FY 2025 Plans: Not Applicable			
Congressional Add: Program increase: Zero-trust environment for semiconductor technology	2.000	0.000	
FY 2024 Accomplishments: Conduct Congressional directed efforts			
FY 2025 Plans: Not Applicable			
Congressional Adds Subtotals	17.000	0.000	
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
Not applicable			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025														
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602204F / Aerospace Sensors				Project (Number/Name) 622003 / EO Sensors & Countermeasures Tech															
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost												
622003: EO Sensors & Countermeasures Tech	0.000	25.549	25.965	0.000	0.000	0.000	-	-	-	-	-	-												
Note In FY 2026, within Program 0602204F, Aerospace Sensors, the technical work and funding for the Passive Electro-Optical/Infrared Sensing in Contested Environments Effort, moved from Project 622003, EO Sensors & Countermeasures Tech to Project 627622, RF Sensors and Countermeasures Tech, Electro-Optical/Infrared Sensing in Contested Environments Effort. In FY 2026, within Program 0602204F, Aerospace Sensors, the technical work and funding for the Laser Radar Sensing in Contested Environments Effort, moved from Project 622003, EO Sensors & Countermeasures Tech to Project 627622, RF Sensors and Countermeasures Tech; Laser Radar Sensing in Contested Environments Effort. A. Mission Description and Budget Item Justification This project develops advanced electro-optical aerospace sensor technologies for a variety of offensive and defensive applications. The sensor technologies under development cover the ultraviolet through the infrared portion of the spectrum. Technical efforts include improvements in system integration, digital processing, analysis tools, and sensor architectures. One of the project's goals is to improve electro-optical and related technologies for the detection, tracking, and identification of non-cooperative and difficult targets, such as those obscured by camouflage or operating at significant range. This project also develops the passive and active sensors and algorithms needed to enable precision targeting in challenging operating environments as well as advanced electro-optical threat warning and countermeasures technologies. These technologies are critical to future aerospace surveillance and targeting. B. Accomplishments/Planned Programs (\$ in Millions) <table><tr><td>Title: Passive Electro-Optical/Infrared Sensing in Contested Environments</td><td>FY 2024</td><td>FY 2025</td><td>FY 2026</td></tr><tr><td>Description: Develop innovative passive optical sensing technology to support surveillance, reconnaissance and targeting in contested environments. Develop high performance cameras, aperture technologies, novel sensing architectures, advanced exploitation, and imaging techniques capable of detection, tracking and identification of multi-domain threats.</td><td>14.478</td><td>12.248</td><td>0.000</td></tr><tr><td>FY 2025 Plans: - Complete development of baseline advanced processing algorithms for hyperspectral imaging. Initiate development of thermal infrared hyperspectral technologies to enable day/night capability. - Complete development of multi-domain sensing systems for critical Department of the Air Force needs, including visible-band event-based sensors and passive interferometry. - Continue development of novel multi-domain sensing concepts, including infrared event-based sensors and motion target indicator technology.</td><td></td><td></td><td></td></tr></table>													Title: Passive Electro-Optical/Infrared Sensing in Contested Environments	FY 2024	FY 2025	FY 2026	Description: Develop innovative passive optical sensing technology to support surveillance, reconnaissance and targeting in contested environments. Develop high performance cameras, aperture technologies, novel sensing architectures, advanced exploitation, and imaging techniques capable of detection, tracking and identification of multi-domain threats.	14.478	12.248	0.000	FY 2025 Plans: - Complete development of baseline advanced processing algorithms for hyperspectral imaging. Initiate development of thermal infrared hyperspectral technologies to enable day/night capability. - Complete development of multi-domain sensing systems for critical Department of the Air Force needs, including visible-band event-based sensors and passive interferometry. - Continue development of novel multi-domain sensing concepts, including infrared event-based sensors and motion target indicator technology.			
Title: Passive Electro-Optical/Infrared Sensing in Contested Environments	FY 2024	FY 2025	FY 2026																					
Description: Develop innovative passive optical sensing technology to support surveillance, reconnaissance and targeting in contested environments. Develop high performance cameras, aperture technologies, novel sensing architectures, advanced exploitation, and imaging techniques capable of detection, tracking and identification of multi-domain threats.	14.478	12.248	0.000																					
FY 2025 Plans: - Complete development of baseline advanced processing algorithms for hyperspectral imaging. Initiate development of thermal infrared hyperspectral technologies to enable day/night capability. - Complete development of multi-domain sensing systems for critical Department of the Air Force needs, including visible-band event-based sensors and passive interferometry. - Continue development of novel multi-domain sensing concepts, including infrared event-based sensors and motion target indicator technology.																								

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602204F / Aerospace Sensors	Project (Number/Name) 622003 / EO Sensors & Countermeasures Tech		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Complete development of large format, long wave infrared detector array for infrared search and track and perform system testing. - Complete development of low size, weight and power processor for infrared search and track. - Initiate development of low size, weight and power infrared search and track sensors. FY 2026 Plans: In FY 2026 the funding and technical activities from this effort were realigned to Program 0602204F, Aerospace Sensors; Project 627622, RF Sensors and Countermeasures Tech; Passive Electro-Optical/Infrared Sensing in Contested Environments to better integrate electro-optical and radio frequency sensing technologies into needed Department of the Air Force capabilities. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$12.248 million. This is a result of realignment of funding and technical activities from this project to Program 0602204F, Aerospace Sensors; Project 627622, RF Sensors and Countermeasures Tech; Passive Electro-Optical/Infrared Sensing in Contested Environments Effort.				
Title: Laser Radar Sensing in Contested Environments Description: Develop innovative laser sensing technology for non-cooperative identification and targeting of airborne and surface targets in contested environments. Develop optical spectrum transmitters, detectors, agile aperture and exploitation technologies capable of sensing multiple target characteristics for robust non-cooperative target identification. FY 2025 Plans: - Complete multi-mode laser radar system demonstration and validation for attritable platforms. - Complete effort to reduce size, weight, and power of laser radar systems. - Continue development of processing software for multi-mode laser radar with a focus on processing efficiency. - Complete work on nonmechanical beam steering methods for optical apertures. - Complete designing large aperture laser radar for high-resolution imaging needs. - Initiate effort to improve performance, size, weight and power of laser radar components. FY 2026 Plans: In FY 2026 the funding and technical activities from this effort were realigned to Program 0602204F, Aerospace Sensors; Project 627622, RF Sensors and Countermeasures Tech; Laser Radar Sensing in Contested Environments Effort to better integrate electro-optical and radio frequency sensing technologies into needed Department of the Air Force capabilities. FY 2025 to FY 2026 Increase/Decrease Statement:		11.071	13.717	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602204F / Aerospace Sensors	Project (Number/Name) 622003 / EO Sensors & Countermeasures Tech		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
FY 2026 decreased compared to FY 2025 by \$13.717 million. This is a result of realignment of funding and technical activities from this project to Program 0602204F, Aerospace Sensors; Project 627622, RF Sensors and Countermeasures Tech; Laser Radar Sensing in Contested Environments Effort.				
Accomplishments/Planned Programs Subtotals		25.549	25.965	0.000
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
Not applicable				

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force	Date: June 2025

Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602204F / Aerospace Sensors				Project (Number/Name) 622005 / Cyber Technology			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
622005: <i>Cyber Technology</i>	0.000	14.351	13.839	0.000	0.000	0.000	-	-	-	-	-	-

Note

In FY 2026, within the Program 0602204F, Aerospace Sensors, the technical work and funding in Project 622005, Cyber Technology; Flexible and Secure Avionics Effort, is being integrated into Project 624920, Electronic Warfare Technology; Radio Frequency Electronic Warfare Technologies Effort (\$2.353M); and Project 627622, RF Sensors and Countermeasures Tech; Multiband Multifunction Radio Frequency Sensing Effort (\$5.301M) and Distributed Radio Frequency Sensing Effort (\$6.480M).

A. Mission Description and Budget Item Justification

This project focuses on technologies for enabling agile and resilient Air Force mission systems. This project improves our understanding of cyber vulnerabilities of mission systems by investigating the fundamental nature of those vulnerabilities including: how they come about, how they can be discovered, how they can be quantified and categorized, how they can be exploited, and how they can be removed or mitigated to secure the system. This project develops adaptable and resilient hardware/software for real-time avionics cyber-attack pattern recognition and develops a protection system with the capability for autonomous learning, adaptation, and self-protection. This project investigates open architecture concepts and technologies to deliver capability flexibility to Department of the Air Force mission systems. These technologies are matured via integrated capability demonstrations.

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

	FY 2024	FY 2025	FY 2026
Title: Flexible and Secure Avionics	14.351	13.839	0.000
Description: Develop avionics protection tools and capabilities to enable manned and unmanned aircraft, avionics, and related support equipment to automatically adapt to and withstand cyber-attacks. Research and develop tools, methodologies and architecture guidelines that enable the design of avionics systems with sense, learn and adapt capabilities. Support test, maintenance, and acquisition communities with cyber subject matter expertise and techniques through consultation and technical interchange. Support other Services with cyber resiliency capabilities for air, ground and sea platforms and develop Open Mission Systems architectures incorporating cyber protections and resilience technologies.			
FY 2025 Plans: - Continue investigation and development of techniques to enable resilient cyber protections for mission systems. - Continue laboratory demonstrations on flight worthy hardware. - Share expertise with other services and test, maintenance, and acquisition communities. - Continue investigating protection technologies applied to open system architectures to enable resilience in next-generation mission systems and facilitate agility in mission system capability. - Continue development of advanced modular architecture for agile avionics mission systems. - Continue investigation of model-based systems engineering applications to improve agility and resiliency of legacy and next-generation avionics mission systems architectures.			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602204F / <i>Aerospace Sensors</i>	Project (Number/Name) 622005 / <i>Cyber Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Continue to leverage models and open system architecture standards to quicken integration and transition of critical sensors technology. <i>FY 2026 Plans:</i> In FY 2026, the funding and technical activities from this effort are being realigned to Program 0602204F, Aerospace Sensors; Project 624920, Electronic Warfare Technology; Radio Frequency Electronic Warfare Technologies Effort (2.304 million); and Project 627622, RF Sensors and Countermeasures Tech; Multiband Multifunction Radio Frequency Sensing Effort (5.109 million) and Distributed Radio Frequency Sensing Effort (6.345 million) to better integrate the Flexible and Secure Avionics Effort into Electronic Warfare Technology and RF Sensors and Countermeasures Tech Efforts. <i>FY 2025 to FY 2026 Increase/Decrease Statement:</i> FY 2026 decreased compared to FY 2025 by \$13.839 million. This is a result of realignment of funding and technical activities from this effort to Program 0602204F, Aerospace Sensors; Project 624920, Electronic Warfare Technology; Radio Frequency Electronic Warfare Technologies Effort (\$2.353 million); and Project 627622, RF Sensors and Countermeasures Tech; Multiband Multifunction Radio Frequency Sensing Effort (\$5.301 million) and Distributed Radio Frequency Sensing Effort (\$6.480 million).			
Accomplishments/Planned Programs Subtotals		14.351	13.839
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
Not applicable			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602204F / Aerospace Sensors				Project (Number/Name) 624920 / Electronic Warfare Technology			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
624920: Electronic Warfare Technology	0.000	39.929	40.981	38.103	0.000	38.103	-	-	-	-	-	-
Note In FY2026, a portion of the technical work and funding in Program 0602204F, Aerospace Sensors; Project 622005, Cyber Technology; Flexible and Secure Avionics Effort, is being integrated into Program 0602204F, Aerospace Sensors; Project 624920, Electronic Warfare Technology; Radio Frequency Electronic Warfare Technologies Effort (\$2.353M).												
A. Mission Description and Budget Item Justification This project develops and assesses affordable, reliable, all weather radio frequency countermeasure concepts for aerospace applications covering the range of radio frequency sensors including communications, navigation, intelligence, surveillance and reconnaissance (ISR), and radar, both active and passive, across the air, land, sea, space and cyber domains. It develops and evaluates technology for electronic warfare, integrated radar and electronic warfare systems, and electro-optical/infrared seeker defeat. This project develops the radio frequency warning and countermeasure technology for advanced electronic warfare and information operations applications. The project also explores technologies to maintain a military advantage in positioning, navigation and timing integrity, accuracy, and resiliency as well as on aircraft mission assurance - the protection of airborne platforms, manned and unmanned, in contested environments. The ultimate goal of the project is to ensure unrestricted access to the airspace and the electromagnetic spectrum in contested and congested environments.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2024	FY 2025	FY 2026	
Title: Positioning, Navigation and Timing in Contested/Denied Environments									14.230	12.875	11.408	
Description: Research and develop resilient positioning, navigation, and timing. Explore positioning, navigation, and timing solutions to enable novel distributed radio frequency sensing and countermeasure techniques. Develop science and technology solutions to overcome evolving threats to positioning, navigation, and timing capabilities.												
FY 2025 Plans: - Continue research and demonstrations of integrated positioning, navigation, and timing alternatives of advanced satellite navigation user equipment and alternatives to satellite navigation; alternatives to satellite navigation include environmentally sensed magnetic gradient sensing & map generation, and sensor-derived vision aiding and wide-area vision position acquisition. - Continue developing technologies to support airborne precise time and frequency transfer in contested environments, to enable missions such as coherent sensing (intelligence, surveillance, reconnaissance), coherent effects (electromagnetic warfare), and operational concepts such as the Air Battle Management System. - Continue developing and demonstrating trust techniques and apply to Global Navigation Satellite System-based software defined receivers. - Continue research, and initiate development, of software defined antenna electronics; including implementation of advanced techniques on reference hardware.												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602204F / Aerospace Sensors	Project (Number/Name) 624920 / Electronic Warfare Technology		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
- Continue to explore advanced algorithms for software defined navigation. FY 2026 Plans: - Continue research and demonstrations of integrated positioning, navigation, and timing alternatives of advanced satellite navigation user equipment and alternatives to satellite navigation; alternatives to satellite navigation include environmentally sensed magnetic gradient sensing & map generation, and sensor-derived vision aiding and wide-area vision position acquisition. - Continue developing technologies to support airborne precise time and frequency transfer in contested environments, to enable missions such as coherent sensing (intelligence, surveillance, reconnaissance) and coherent effects (electromagnetic warfare). - Continue developing and demonstrating trust techniques and operational concepts such as distribution of trusted satellite trajectories/information to enable blue force use of foreign satellite navigation signals. - Continue research of software defined antenna electronics to complement software defined navigation receiver efforts. Continue to explore advanced algorithms for software defined navigation. - Initiate mission thread modeling for collaborative and alternative navigation techniques. - Initiate magnetic anomaly navigation simulation development and error modeling. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$1.467 million due to re-prioritization to meet the nation's future security needs.					
Title: Radio Frequency Electronic Warfare Technologies Description: This project develops the radio frequency warning and countermeasure technology for advanced electromagnetic warfare and information operations applications. This project develops techniques and technologies to detect and counter the communications links and sensors of threat integrated air defense systems and hostile command and control networks. FY 2025 Plans: - Continue to develop, assess, and mature radio frequency electromagnetic warfare technologies to identify, address, and reason about capabilities and intentions of complex emitters in contested environments; enhance generalized techniques and logic to strengthen adaptive capabilities that lead towards autonomous implementation for optimized response at tactically relevant timescale. - Continue to develop and mature capabilities to defeat advanced radio frequency and multi-spectrum (integrated electro-optical and radio frequency) threats utilizing a common architecture that will feed into multiple advanced technology development programs. - Continue development of radio frequency environment signal-based simulations utilizing a modular open systems approach. - Continue to enhance and upgrade hardware in the loop assessment capabilities to keep pace with complex electromagnetic spectrum background environments and emerging threats.			18.487	21.587	20.373

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602204F / <i>Aerospace Sensors</i>	Project (Number/Name) 624920 / <i>Electronic Warfare Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Continue robust modeling, simulation, and assessment capabilities to analyze and develop advanced threat kill web defeat concepts. FY 2026 Plans: - Continue to develop, assess, and mature radio frequency electromagnetic warfare technologies that provide capabilities against adversary emitters to promote increased airman survivability in a highly dense, highly adaptive complex electromagnetic operating environment. - Continue development and maturation of multi-spectrum capabilities (integrated radio frequency and electro-optical) to defeat threats utilizing a common open architecture to ensure rapid transition to multiple advanced technology development programs. - Continue to enhance and upgrade hardware in the loop assessment capabilities to provide relevant, complex electromagnetic spectrum background environments to ensure successful operation of advanced concepts. - Continue and advance modeling, simulation, and assessment capabilities to analyze, develop, and refine concepts to defeat threat kill webs. - Initiate development of algorithms and techniques that degrade adversary common operating picture to defeat longer-range threats; synchronize effects across multiple platforms to ensure coordinated attacks; advance low cost, size, weight and power technologies to reduce cost and provide non-kinetic mass; investigate countering of adversary targeting and situational awareness capabilities. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$1.214 million. The decrease is due to re-prioritization to meet the nation's future security needs.			
Title: Electro-Optical/Infrared Threat Warning and Countermeasures Technologies Description: Develop electro-optical/infrared sensor countermeasure technologies. Explore novel concepts to enable electro-optical/infrared threat seeker exploitation and surrogate modeling. Conduct fundamental research in countermeasures to defeat electro-optical/infrared threat seekers. Conduct fundamental research on integrated electro-optical/infrared threat warning systems. FY 2025 Plans: - Continue protection of aircraft and aircrew against advanced electro-optical/infrared guided threats by developing new or improved threat detection and countermeasure techniques. - Continue investigation of long-range missile warning and develop laser warning technology concepts to improve aircraft and aircrew survivability. - Continue to validate threat warning results and missile signature modeling using data collected in live-fire tests. - Continue developing the digital engineering ecosystem to create/improve countermeasure techniques and evaluate novel infrared countermeasures system concepts.		7.212	6.519
			6.322

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602204F / <i>Aerospace Sensors</i>	Project (Number/Name) 624920 / <i>Electronic Warfare Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Continue to perform verification and validation activities on digital twin models within this digital ecosystem by collecting data in static flight tests, laboratory measurements, and peer assessments. - Strengthen development and usage of threat surrogates to gain technical knowledge of future and emerging threats. - Continue development of digital engineering components to expand electro-optical and infrared models and information to enhance multi-spectrum threat assessment and develop advanced threat kill web defeat concepts. <i>FY 2026 Plans:</i> - Continue protection of aircraft and aircrew against advanced electro-optical/infrared guided threats by developing new or improved threat detection and countermeasure techniques. Analyze and assess techniques against hardware in the loop capabilities to ensure capabilities work across an increasingly wide range of operating conditions. - Continue investigation of long-range missile warning; develop surrogate models to refine advanced concepts against these threats; coordinate with other modalities to provide a synchronized, effective response against adversary long-range threats. Validate threat warning results and missile signature modeling using data collected in live-fire tests. - Continue to develop laser warning technology concepts to improve aircraft and aircrew survivability and mission success; prototype geolocation of adversary laser threats; continue to perform verification and validation activities on digital twin models within this digital ecosystem by collecting data in static flight tests, laboratory measurements, and peer assessments. - Continue development of digital engineering components to expand electro-optical and infrared models and information to enhance multi-spectrum threat assessment and develop advanced threat kill web defeat concepts. <i>FY 2025 to FY 2026 Increase/Decrease Statement:</i> FY 2026 decreased compared to FY 2025 by \$0.197 million due to re-prioritization to meet the nation's future security needs.			
Accomplishments/Planned Programs Subtotals		39.929	40.981
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
Not applicable			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602204F / Aerospace Sensors				Project (Number/Name) 626095 / Sensor Fusion Technology			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
626095: Sensor Fusion Technology	0.000	50.113	17.995	40.933	0.000	40.933	-	-	-	-	-	-
Note FY 2025 reductions to this project were the result of re-prioritization to meet the nation's future security needs. FY 2026 increased compared to FY 2025 due to re-prioritization within Program 0602204F, Aerospace Sensors to fund this critical project to a level necessary to ensure future Department of the Air Force intelligence, surveillance, and reconnaissance capabilities. Existing contracts have ceiling and manpower available to enable timely FY 2026 execution.												
A. Mission Description and Budget Item Justification This project develops foundational and applied technologies required for closed-loop autonomous sensing employing multiple information domains, diverse sensor phenomena, and multiple platform types to provide intelligence, surveillance, and reconnaissance, target recognition, situational awareness and battlespace visualization, fire control, and battle damage assessment capabilities against a wide variety of air and ground based targets engaged in multitudes of behaviors in a broad range of operational environments. This project conducts exploratory and applied investigations to determine technology feasibility and estimate operational capability constraints associated with missions in future contested and highly contested operating environments, using cooperative and non-cooperative sensing sources. This project develops techniques to automate multi-sensor exploitation and information processing which leverage data fusion, adaptive signal processing, sensor and platform orchestration, and by leveraging artificial intelligence / machine learning research communities. This project develops concepts and algorithms for efficient processing at the edge, parallel processing, distributed processing, and high-performance computing in sensor data processing and synthetic data generation.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2024	FY 2025	FY 2026	
Title: Multi-Domain Sense Making									17.612	9.033	28.350	
Description: Multi-Domain Sense Making develops military relevant technology that fuses information from any source, recognizes and comprehends the environment, and enables improved, timely, and executable battlespace decisions. This effort focuses on translating relevant data from multiple sensors (or single sensor, as needed), modalities, and domains into useable information and information into knowledge for target identification and custody - applied at-the-edge, at forward operating units, and/or in reach-back cells. Technology areas include data association, entity detect/track/identification, information fusion, training with limited data, simulation of sensor and platform performance at the mission level, engagement level, and physics level, to understand performance and trade space amongst these domains, and performance assessment. The application of artificial intelligence and machine learning techniques to address technical challenges in contested environments is a particular emphasis.												
In FY 2026 Battlespace Awareness Sensing Fusion was renamed Multi-Domain Sense Making.												
FY 2025 Plans: - Continue a system of systems construct utilizing the latest in DevSecOps and Open Mission Standards to generate capability at the tactical edge.												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602204F / <i>Aerospace Sensors</i>		Project (Number/Name) 626095 / <i>Sensor Fusion Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
- Continue to generate knowledge through multiple spatial and temporal sensing systems through improved information fusion. - Continue to research solutions in a train/test data limited environment. - Continue to leverage state of the art algorithm techniques leveraging artificial intelligence with deep learning and machine learning. - Continue to exploit stationary and moving objects of interest in multiple domains by way of pattern of life understanding, applying next-generation information understanding tools and emerging techniques, over a broad set of sensing operating conditions. - Continue to advance research in multi-domain sensing applied to air, ground and surface targets. - Continue to improve fusion of hard and soft information sources. - Continue to improve the amount of time required to move research from basic to applied to advanced demonstrations. - Continue to standardize integration environments, expand simulation capabilities and investigate model-based systems engineering best practices. FY 2026 Plans: - Continue a system of systems construct utilizing the latest in development, security, and operations and open mission standards to generate capability at the tactical edge. - Continue to generate knowledge by fusing information from multiple spatial and temporal sensing systems, improving the state of the art in information fusion. - Continue to provide solutions in contested, train/test data limited environments. - Continue to advance state of the art algorithm techniques leveraging artificial intelligence with deep learning and machine learning. - Continue research, development, and application of machine reasoning techniques and next-generation information understanding tools to identify intent/purpose of stationary and moving objects of interest in multiple domains, over a broad set of sensing operating conditions. - Continue to advance research in multi-domain sense making applied to air, ground, and maritime surface targets. - Continue to improve the amount of time required to move research from basic to applied to advanced demonstrations. - Continue to standardize integration environments, expand simulation capabilities, and investigate model-based systems engineering best practices. - Continue development of performance evaluation techniques addressing both single-intelligence sensing systems as well as closed-loop systems-of-systems. - Continue to perform empirical performance measurements in addition to performance prediction estimates for automated/ autonomous intelligence, surveillance, and reconnaissance exploitation systems of military-critical targets with limited train and test data. - Continue to leverage cluster compute, cloud compute, and high-performance compute facilities. - Continue research in new novel techniques to exploit unforeseen information from non-traditional information sources. FY 2025 to FY 2026 Increase/Decrease Statement:					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602204F / Aerospace Sensors	Project (Number/Name) 626095 / Sensor Fusion Technology	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
FY 2026 increased compared to FY 2025 by \$19.317 million. This is a result of realignment of funding and technical activities from the following efforts within Program 0602204F, Aerospace Sensing; Project 626095, Sensor Fusion Technology, to this effort. - Multi-Domain Sensing Effects and Analysis Effort (\$2.560M). - Cyber Physical Sensing Effort (\$2.973M). Increase is also the result of reprioritization within Program 0602204F, Aerospace Sensing to fund this critical effort to a level necessary to ensure future Department of the Air Force intelligence, surveillance, and reconnaissance capabilities.			
Title: Multi-Domain Sensing Effects and Analysis Description: This effort focuses on two primary areas: (1) Multi domain sensing and effects mission analysis and (2) performance understanding and assessments. It develops methodologies and modeling, simulation, and analysis tools to enable multi-domain analysis and technology development, informing other efforts and projects across the directorate. Investments in modeling, simulation and analysis represent current and next generation sensing platforms to include multiple domains. Technologies include: fusion of information, battlespace understanding, and the ability to simulate sensor and platform performance at the mission level, engagement level, and physics level, to understand performance and trade space amongst these domains. FY 2025 Plans: - Continue development of performance evaluation techniques addressing both single-intelligence sensing systems as well as closed-loop systems-of-systems. - Continue to perform empirical performance measurements in addition to performance prediction estimates for automated/ autonomous intelligence, surveillance and reconnaissance exploitation systems of military-critical targets with limited train and test data. - Continue the employment of data-as-a-service research environment across unclassified and classified networks. - Continue to leverage cluster compute, cloud compute, and high-performance compute facilities to enable autonomy developers and warfighting analysts. - Continue to transition to defense applications, data tagging, automated data availability architecture in a service-wide application along with our intelligence community partners. - Continue the development of the test and evaluation test harness for department-wide evaluation analysis community leveraging standardized test metrics and performance measurement understanding. FY 2026 Plans: In FY 2026 the funding and technical activities from this effort were realigned to Program 0602204F, Aerospace Sensors; Project 626095, Sensor Fusion Technology; Multi-Domain Sense Making (\$2.560 million) and Sensing Autonomy efforts (\$1.261million). FY 2025 to FY 2026 Increase/Decrease Statement:		3.728	1.871
			0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025			
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602204F / Aerospace Sensors	Project (Number/Name) 626095 / Sensor Fusion Technology		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
FY 2026 decreased compared to FY 2025 by \$1.871 million. This is a result of realignment of funding and technical activities from this project to Program 0602204F, Aerospace Sensors; Project 626095, Sensor Fusion Technology; Multi-Domain Sense Making Effort (\$2.560M) and Sensing Autonomy Effort (\$1.261M).					
Title: Sensing Autonomy			9.671	4.986	12.583
Description: Sensing Autonomy develops orchestration systems for use at the edge and in intelligence, surveillance and reconnaissance custody chain command and control. Sensing Autonomy enables predictive analytics, autonomous behaviors, resource management, and mission planning onboard crewed/uncrewed aerial platforms. Applies sensing management principles to multi-domain info sources, accelerating sensing and analysis for autonomy in motion/at rest. Sensing Autonomy will be developed with the Department of the Air Force's digital transformation efforts, requiring the use of modeling, simulation and analysis, digital artifact creation/reuse, software engineering, development, security, and operations, and cyber secure software integration/testing. The primary areas of research in Sensing Autonomy include optimization, sensor data processing, autonomy, and predictive analytics. Technical focus areas include natural language processing, entity recognition, synthetic grammars, track-based activity representation, graph-based knowledge representation and analytics, machine learning, power domination application to graph applications, correlation assessment of streaming sensor information, probabilistic estimation spiking neural networks, analogy learning, and reinforcement learning.					
In FY 2026 Knowledge and Execution Management was renamed Sensing Autonomy.					
FY 2025 Plans:					
- Continue applying research to autonomy techniques for mission resource management, command & control, sense making, resource planning, and mission orchestration.					
- Continue applied research in direct support of systems of systems programs.					
- Continue to accomplish performance understanding through simulation, demonstration, and blended simulation/live testing (multiple vehicles & sensors).					
- Continue expanding the capabilities and scope of computational efficiency of on-board reasoning for tactical-edge Sensing Autonomy beyond specific high value airborne targets to improve prosecution of a broader set of air and surface targets.					
- Continue research in foundational knowledge of management algorithms for battlespace awareness incorporating interacting air/ground targets, air/air targets, and air/surface environments, and operationally representative contingencies.					
- Continue investigations of algorithms to perform information reasoning and continue to evolve forms of representations and combined representations and reasoning approaches.					
- Initiate investigation of lightweight, low power computational methods for edge computing solutions; to include neural emulation, cognitive processing, and machine learning techniques.					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602204F / <i>Aerospace Sensors</i>	Project (Number/Name) 626095 / <i>Sensor Fusion Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Initiate further applied research on the algorithmic tracking of multiple interacting targets across domains, environments, and operationally relevant contingencies. FY 2026 Plans: - Continue applying research to autonomy techniques for mission resource management, command & control, sense making, resource planning, and mission orchestration. - Continue applied research in direct support of systems of systems programs. - Continue to accomplish performance understanding through simulation, demonstration, and blended simulation/live testing (multiple vehicles & sensors); develop additional functionality, especially dynamic geometric collaborative uncrewed aerial vehicle behaviors. - Continue expanding the capabilities and scope of computational efficiency of on-board reasoning for tactical-edge sensing autonomy beyond specific high value airborne targets to improve prosecution of a broader set of air and surface targets. - Continue research in foundational knowledge of management algorithms for battlespace awareness incorporating interacting air/ground targets, air/air targets, and air/surface targets, and operationally representative contingencies. - Continue investigations of algorithms to perform information reasoning and continue to evolve forms of representations and combined representations and reasoning approaches. - Continue investigation of lightweight, low-power computational methods for edge computing solutions; to include neural emulation, cognitive processing, and machine learning techniques. - Initiate further applied research on the algorithmic tracking of multiple interacting targets across domains, environments, and operationally relevant contingencies. - Initiate simulation scenarios/tests with uncrewed aerial vehicles, sensors, and various operating conditions. - Initiate applied research with uncrewed aerial vehicles swarming technology for additional functionality. - Initiate the use of natural language processing to extract activities from reports. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$7.597 million. This is a result of realignment of funding and technical activities from the following efforts within Program 0602204F, Aerospace Sensors; Project 626095, Sensor Fusion Technology, to this effort. - Multi-Domain Sensing Effects and Analysis effort (\$1.261M). - Cyber Physical Sensing effort (\$1.464M). Increase is also the result of reprioritization within Program 0602204F, Aerospace Sensing to fund this critical effort to a level necessary to ensure future Department of the Air Force intelligence, surveillance, and reconnaissance capabilities.			
Title: Cyber Physical Sensing		4.102	2.105
			0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602204F / Aerospace Sensors		Project (Number/Name) 626095 / Sensor Fusion Technology	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
Description: Cyber Physical Sensing is the opportunity to exploit the internet of things and other non-traditional intelligence, surveillance and reconnaissance sensing systems in a way other than what they were designed to do. This additional source of information closes the gap between current intelligence, surveillance and reconnaissance collection capabilities and the vision of all intelligence, surveillance and reconnaissance, all the time. This technology investment looks at the sensing opportunities which exist at the point where physics meets the cyber domain. This effort focuses on the proliferated sensing devices, extracting information from multi-intelligence sensors and translating that information into detection, tracking and identification by use of multi-intelligence fusion. This effort leverages processing at-the-edge and distributed processing, exploited using new-generation machine learning, artificial intelligence and deep learning techniques. FY 2025 Plans: - Continue research in non-traditional intelligence, surveillance and reconnaissance collection and exploitation opportunities; understand through performance evaluation and estimation where the best return on investment opportunities in non-traditional collection are. - Continue improv collection, processing and dissemination of intelligence, allowing for automation and autonomy. - Continue research and development at the edge and edge-to-core/cloud. - Continue research in cyber-physical sensing capabilities through system of system information flows. - Continue investigating transition opportunistic/non-traditional/proliferated sensing products into Department of the Air Force integrated capability programs. - Continue research in new novel techniques to exploit unforeseen information from these non-traditional information sources. - Continue research and development for the advancement of tactics, techniques, and procedures by way of new cyber-physical modalities. FY 2026 Plans: In FY 2026 the funding and technical activities from this effort were realigned to Program 0602204F, Aerospace Sensors; Project 626095, Sensor Fusion Technology; Multi-Domain Sense Making Effort (\$2.973 million) and Sensing Autonomy Effort (\$1.464 million). FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$2.105 million. This is a result of realignment of funding and technical activities from this project to Program Element 0602204F, Aerospace Sensors, Project 626095, Sensor Fusion Technology, Multi-Domain Sense Making and Sensing Autonomy efforts.					
Accomplishments/Planned Programs Subtotals			35.113	17.995	40.933
			FY 2024	FY 2025	
Congressional Add: Cyber kinetic combat environment			15.000	-	

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602204F / Aerospace Sensors	Project (Number/Name) 626095 / Sensor Fusion Technology
	FY 2024	FY 2025
FY 2024 Accomplishments: Conduct Congressional directed efforts		
Congressional Adds Subtotals	15.000	-

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

N/A

Remarks

D. Acquisition Strategy

Not applicable

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602204F / Aerospace Sensors				Project (Number/Name) 627622 / RF Sensors and Countermeasures Tech			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
627622: RF Sensors and Countermeasures Tech	0.000	42.269	43.857	66.412	0.000	66.412	-	-	-	-	-	-
Note In FY 2026, within Program 0602204F, the technical work and funding in Project 622003, EO Sensors & Countermeasures Tech; Passive Electro-Optical/Infrared Sensing in Contested Environments Effort, is being integrated into Project 627622, RF Sensors and Countermeasures Tech; Passive Electro-Optical/Infrared Sensing in Contested Environments Effort. In FY 2026, within Program 0602204F, the technical work and funding in Project 622003, EO Sensors & Countermeasures Tech; Laser Radar Sensing in Contested Environments Effort is being integrated into Project 627622, RF Sensors and Countermeasures Tech; Laser Radar Sensing in Contested Environments Effort. In FY2026, within Program 0602204F, a portion of the technical work and funding in Project 622005, Cyber Technology; Flexible and Secure Avionics Effort, is being integrated into Project 627622, RF Sensors and Countermeasures Tech; Multiband Multifunction Radio Frequency Sensing (\$5.301M) and Distributed Radio Frequency Sensing (\$6.480M) Efforts.												
A. Mission Description and Budget Item Justification This project develops and assesses affordable, reliable all weather radio frequency sensing and countermeasure concepts for aerospace applications covering the range of radio frequency sensors including communications, navigation, intelligence, surveillance and reconnaissance, and radar, both active and passive, across multiple domains. This project also develops and evaluates technology for intelligence, surveillance and reconnaissance sensors, fire control radars, electromagnetic warfare, integrated radar and electromagnetic warfare systems, and offensive information operations systems. It emphasizes the detection and tracking of surface and airborne targets with radio frequency signatures that are difficult to detect due to reduced radar cross sections, concealment and camouflage measures, severe clutter, or heavy jamming. Techniques exploited include the use of multiple radio frequency phenomenologies, multi-dimensional adaptive processing, advanced waveforms and knowledge-aided processing techniques. It also develops advanced electro-optical aerospace sensor technologies for a variety of offensive and defensive applications. The sensor technologies under development cover the ultraviolet through the infrared portion of the spectrum. Technical efforts include improvements in system integration, digital processing, analysis tools, and sensor architectures. One of the project's goals is to improve electro-optical and related technologies for the detection, tracking, and identification of noncooperative and difficult targets, such as those obscured by camouflage or operating at significant range. This project also develops the passive and active sensors and algorithms needed to enable precision targeting in challenging operating environments as well as advanced electro-optical threat warning and countermeasures technologies. The project also explores technologies to maintain a military advantage in positioning, navigation and timing integrity, accuracy, and resiliency. This project also develops concepts to counter threats to our aerospace systems. It develops and evaluates technology for electromagnetic warfare, integrated radar and electromagnetic warfare systems, and electro-optical/infrared seeker defeat.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2024	FY 2025	FY 2026	
Title: Multiband Multifunction Radio Frequency Sensing									14.265	14.741	22.185	

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602204F / Aerospace Sensors	Project (Number/Name) 627622 / RF Sensors and Countermeasures Tech	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
Description: Develop multi-band and multi-beam forming technologies. Address technologies for antenna array operations in dynamic sensor networks. FY 2025 Plans: - Continue advanced mode development for multi-beam and multi-function digital arrays, implementing more complex modes and advanced waveforms with applications for Advanced Early Warning radar. - Continue migration of mode implementation from custom interfaces to Department of Defense and Department of the Air Force standardized interfaces. - Initiate development of modes using standardized interfaces and utilizing hardware architectures representative of emerging Department of the Air Force systems. - Continue integration of additively manufactured antennas and radar backend components to demonstrate low-cost, wide bandwidth, scalable, and conformal phased array antennas for uncrewed sensing platforms. - Continue analysis identifying performance bounds and requirements for low-cost radio frequency sensors in selected mission scenarios. - Continue development of techniques for analysis of complex active electronically scanned arrays on large platforms. FY 2026 Plans: - Continue advanced mode development for multi-beam and multi-function digital arrays, implementing more complex modes and advanced waveforms with applications for Advanced Early Warning radar. - Complete migration of mode implementation from custom interfaces to Department of Defense and Department of the Air Force standardized interfaces. - Continue development of modes using standardized interfaces and utilizing hardware architectures representative of emerging Department of the Air Force systems. - Complete integration of additively manufactured antennas and radar backend components to demonstrate low-cost, wide bandwidth, scalable, and conformal phased array antennas for uncrewed sensing platforms. - Complete analysis identifying performance bounds and requirements for low-cost radio frequency sensors in selected mission scenarios. - Continue development of techniques for analysis of complex active electronically scanned arrays on large platforms. - Continue investigation of emerging receiver technology such as quantum enabled receivers. - Initiate deployment of passive sensing techniques for detecting, geolocating, and characterizing signals of interest onto advanced multifunction systems targeted to small and large platforms - Initiate development of multifunction, wideband radio frequency sensor payloads using scalable, open system architectures and commercially available International Traffic in Arms Regulations products.			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602204F / <i>Aerospace Sensors</i>	Project (Number/Name) 627622 / <i>RF Sensors and Countermeasures Tech</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Initiate scalable mode development for low cost, size, weight, and power multifunction arrays to support Autonomous Collaborative Platform mission payloads. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$7.444 million due to a portion of the technical work and funding in Program 0602204F, Aerospace Sensors; Project 622005, Cyber Technology; Flexible and Secure Avionics Effort, being integrated into Program 0602204F, Aerospace Sensors; Project 627622, RF Sensors and Countermeasures Tech; Multiband Multifunction Radio Frequency Sensing Effort (\$5.301 million).			
Title: Passive Radio Frequency Sensing Description: Develop a system that performs traditional radar sensing modes through passive means. The research plan is designed to continue the development of the subsystems which make up the passive radar and to follow a spiral development path that involves the integration and testing of various technology instantiations to produce alternate versions of a full passive multi-mode system. Includes the development of low size-weight-and-power radio frequency signal detection and geolocation payloads for small uncrewed air systems and the integration of advanced receiver subsystems to meet a particular need of the Department of the Air Force. Explore combat identification technologies, modeling and simulation enhancements, and technologies supporting passive radar, electronic support, and signals intelligence. FY 2025 Plans: - Continue development of small low-cost direction-finding payloads and advanced processing techniques for onboard signal characterization, geolocation/track, and signals pattern-of-life analysis. - Continue demonstrating distributed multi-ship geolocation aboard an expanded set of small uncrewed aircraft systems responsive to user requirements. - Continue development of enhanced radio frequency modeling and simulation tools for evaluation of passive radar performance in complex environments. - Continue enhancement of clutter modelling capability by incorporating sea clutter models from the Navy into the Department of the Air Force analysis tools to support performance and mission modeling including maritime targets. - Continue integrating high-fidelity modeling and simulation with mission level modeling to demonstrate operational utility of passive radar concepts. - Initiate study of analysis tools and architectures in order to improve re-use across the Department of the Air Force research community. - Continue analysis of bi-static target/ground scattering phenomenology and bi-static high resolution radar data in conjunction with advanced automated target recognition algorithms to demonstrate improved accuracy and timeliness for combat identification of complex targets.		14.360	14.759
			0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602204F / <i>Aerospace Sensors</i>	Project (Number/Name) 627622 / <i>RF Sensors and Countermeasures Tech</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Continue the investigation of advanced processing techniques to enhance passive radar performance and enhance target identification performance. - Continue investigation of emerging receiver technology such as quantum enabled receivers. FY 2026 Plans: In FY 2026 the funding and technical activities from this effort were realigned to Program 0602204F, Aerospace Sensors; Project 627622, RF Sensors and Countermeasures Tech; Distributed Radio Frequency Sensing effort. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$14.759 million. This is a result of realignment of funding and technical activities from this project to Program Element 0602204F, Aerospace Sensors; Project 627622, RF Sensors and Countermeasures Tech; Distributed Radio Frequency Sensing Effort.			
Title: Distributed Radio Frequency Sensing Description: Develop innovative, timely, and affordable target detection, tracking, characterization and geolocation capabilities using distributed and passive radio frequency techniques. Distributed radio frequency leverages two or more spatially distributed receivers and transmitters that use cooperative radio frequency transmitters (illuminators), namely those radio frequency sources that have a common objective to the receiver systems being used. Explore technologies supporting passive radar, electronic support, and signals intelligence, utilizing modeling and simulation, advanced receiver subsystems, and digital signal processing enhancements. FY 2025 Plans: - Continue development of multi-static transmit waveforms and receive processing chains for multi-static ground moving target indicator concepts. - Continue investigation of potential platform constraints. - Continue enhancements of multi-static synthetic aperture radar algorithms to support combat identification and automatic target recognition requirements on tactical timelines. - Complete implementation and demonstration of multi-static synthetic aperture radar algorithms on cost and size constrained platforms. - Complete development/maturation of distributed 3-dimensional imaging algorithms that are scalable to a multi-domain approach. - Continue data collection and analysis to assess distributed radar concepts for ground moving target indicator and synthetic aperture radar. - Continue to explore multi- and cross-domain applications. FY 2026 Plans:		13.644	14.357
			23.164

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025			
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602204F / Aerospace Sensors	Project (Number/Name) 627622 / RF Sensors and Countermeasures Tech		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026	
- Complete development of multi-static transmit waveforms and receive processing chains for multi-static ground moving target indicator concepts. - Complete investigation of potential platform constraints. - Continue enhancements of multi-static synthetic aperture radar algorithms to support combat identification and automatic target recognition requirements on tactical timelines. - Continue data collection and analysis to assess distributed radar concepts for ground moving target indicator and synthetic aperture radar. - Complete multi- and cross-domain applications. - Continue development of enhanced radio frequency modeling and simulation tools for evaluation of passive radar performance in complex environments. - Continue enhancement of clutter modelling capability by incorporating sea clutter models from the Navy into the Department of the Air Force analysis tools to support performance and mission modeling including maritime targets. - Continue integrating high-fidelity modeling and simulation with mission level modeling to demonstrate operational utility of distributed and passive radar concepts. - Continue analysis of bi-static target/ground scattering phenomenology and bi-static high resolution radar data in conjunction with advanced automated target recognition algorithms to demonstrate improved accuracy and timeliness for combat identification of complex targets. - Initiate investigations into synchronizing less capable radars to determine if they can achieve or exceed high value asset performance creating targeting/automatic target recognition-quality synthetic aperture radar imagery. - Initiate investigations into performing automatic target recognition on moving targets. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$8.807 million. This is a result of realignment of funding and technical activities from Program Element 0602204F, Aerospace Sensors, Project 627622, RF Sensors and Countermeasures Tech, Passive Radio Frequency Sensing Effort to this effort.					
Title: Laser Radar Sensing in Contested Environments		0.000	0.000	13.840	
Description: Develop innovative laser sensing technology for non-cooperative identification and targeting of air/space and surface targets in contested environments. Develop optical spectrum transmitters, detectors, agile aperture and exploitation technologies capable of sensing multiple target characteristics for robust non-cooperative target identification.					
FY 2025 Plans: Not Applicable					
FY 2026 Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602204F / Aerospace Sensors		Project (Number/Name) 627622 / RF Sensors and Countermeasures Tech	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
- Continue development of processing software for multi-mode laser radar with a focus on processing efficiency. - Continue effort to reduce size, weight, power, and cost of laser radar systems and subsystems. - Continue efforts to improve the performance and capabilities of laser radar components, including: transmitters, detectors, and agile aperture and beam steering methods and mechanisms. - Initiate efforts to improve and validate laser radar data processing and exploitation algorithms, including the associated development, verification, and validation of physics-based and mission-based performance models and simulations. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by 13.840 million. This is a result of realignment of funding and technical activities from Program 0602204F, Aerospace Sensors, Project 622003, EO Sensors and Countermeasures Tech, Laser Radar Sensing in Contested Environments Effort to this effort.					
Title: Passive Electro-Optical/Infrared Sensing in Contested Environments Description: Develop innovative passive optical sensing technology to support surveillance, reconnaissance and targeting in contested environments. Develop high performance cameras, aperture technologies, novel sensing architectures, advanced exploitation, and imaging techniques capable of detection, tracking and identification of multi-domain threats. FY 2025 Plans: Not Applicable FY 2026 Plans: - Initiate development of low cost, size, weight, and power optimized smaller pitch, large format long wave infrared detector array for infrared search and track missions on next-gen air combat vehicles. --Continued testing of large format, long wave infrared detector array for infrared search and track, to include flight testing on an air platform. - Continue development of low size, weight and power processing for infrared search and track. - Continue low cost, size, weight, and power optimized electro-optical/infrared payload and algorithm development for day/night detection and tracking capabilities addressing Department of the Air Force Operational Imperative #3 "Moving Target Engagement at Scale". - Continue infrared event-based sensor chip research and development towards mission-level format arrays and supporting algorithms - Initiate development of thermal infrared hyperspectral technologies to enable day/night capability. FY 2025 to FY 2026 Increase/Decrease Statement:			0.000	0.000	7.223

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602204F / Aerospace Sensors	Project (Number/Name) 627622 / RF Sensors and Countermeasures Tech		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
FY 2026 increased compared to FY 2025 by \$7.223 million. This is a result of realignment of funding and technical activities from Program 0602204F, Aerospace Sensors; Project 622003, EO Sensors & Countermeasures Tech; Passive Electro-Optical/Infrared Sensing in Contested Environments Effort to this effort.				
Accomplishments/Planned Programs Subtotals		42.269	43.857	66.412
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
Not applicable				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force	Date: June 2025

Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
3600: Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research					PE 0602212F I Defense Laboratories R&D Projects (10 U.S.C, Sec 2358)							
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
Total Program Element	0.000	111.692	0.000	0.000	0.000	0.000	-	-	-	-	-	-
622030: Defense Lab R&D Projects	0.000	111.692	0.000	0.000	0.000	0.000	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

Implementation of 10 U.S.C. Section 2363, amendment to PL 110-417, 10 U.S.C. Section 2358 and 10 U.S.C. 2805(d)(1)(B), to fund: innovative basic and applied research conducted at the defense laboratory and supports military missions; development programs supporting the transition of technologies developed by the defense laboratory into operational use; workforce development activities improving the capacity of the defense laboratory to recruit and retain personnel with necessary scientific and engineering expertise that support military missions; and the repair or minor military construction of the laboratory infrastructure and equipment.

The Air Force is dependent on technological advances in response to emerging threats and to maintain a competitive advantage. Air Force has a comprehensive and deliberative planning process to identify and fund research that is expected to have the greatest benefit to the Air Force and the warfighter. 10 U.S.C. Section 2363 provides the Commander of the Air Force Research Laboratory (AFRL), in consultation with the Air Force Science and Technology (S&T) Executive, a degree of flexibility to rapidly exploit scientific breakthroughs or respond to emerging threats, to include developing a skilled workforce and necessary infrastructure. This flexibility increases the rate of innovation and accelerates the development and fielding of needed military capabilities to address current and future problems.

The Air Force has established PE 0602212F, where the 10 U.S.C. Section 2363 funds are internally reprogrammed to this program element in the year of execution after receipt of the appropriation. This allows increased transparency to Congress on 10 U.S.C. Section 2363 funding and additional execution flexibility for 10 U.S.C. Section 2363 activities to cross all technology areas.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force					Date: June 2025
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research		R-1 Program Element (Number/Name) PE 0602212F I Defense Laboratories R&D Projects (10 U.S.C, Sec 2358)			
B. Program Change Summary (\$ in Millions)	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	111.692	0.000	0.000	0.000	0.000
Total Adjustments	111.692	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	111.692	0.000	0.000	0.000	0.000
 Change Summary Explanation					
Increase in FY 2024 in Other Adjustments is due to realignment of funds to PE 0602212F to support Research and Development Projects, 10 U.S.C. Section 2358, as amended by 10 U.S.C. 2805(d)(1)(B) and 10 U.S.C. Section 2363.					
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2024	FY 2025
Title: Defense Laboratories R&D Projects - Air Force Research Laboratory				111.692	-
Description: Implementation of 10 U.S.C. Section 2363, amendment to PL 110-417, 10 U.S.C. Section 2358 and 10 U.S.C. 2805(d)(1)(B), to fund: innovative basic and applied research conducted at the Air Force Research Laboratory (AFRL) and supports military missions; development programs supporting the transition of technologies developed by AFRL into operational use; workforce development activities improving the capacity of AFRL to recruit and retain personnel with necessary scientific and engineering expertise that support military missions; and the repair or minor military construction of the laboratory infrastructure and equipment.					
Accomplishments/Planned Programs Subtotals				111.692	-
D. Other Program Funding Summary (\$ in Millions)					
N/A					
Remarks					
E. Acquisition Strategy					
Not Applicable					

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force	Date: June 2025

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research</i>					R-1 Program Element (Number/Name) PE 0602298F <i>I Science and Technology Management - Major Headquarters Activities</i>							
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
Total Program Element	0.000	10.303	9.662	10.813	0.000	10.813	-	-	-	-	-	-
622520: <i>Science and Technology Management - Major HQ</i>	0.000	10.303	9.662	10.813	0.000	10.813	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

The Air Force Research Laboratory (AFRL) is a global technical enterprise, boasting some of the best and brightest leaders in the world. It provides revolutionary, relevant, and responsive science and technology (S&T) to the Warfighter. AFRL's mission is to lead the discovery, development, and integration of affordable warfighting technologies for the global air, space, and cyberspace force.

The FY26 request for 0602298F was reduced by \$0.918 million for civilian personnel to optimize the workforce in compliance with Executive Order 14210, "Implementing the President's Department of Government Efficiency Workforce Optimization Initiative."

This program element may include necessary civilian pay expenses required to manage, execute, and deliver science & technology capabilities. The use of program funds in this program element would be in addition to the civilian pay expenses budgeted in program elements 0601102F, 0602020F, 0602102F, 0602201F, 0602202F, 0602203F, 0602204F, 0602336F, 0602602F, 0602605F, 0602788F, 0602298F, 0603680F, 1206601SF and 1206616SF. In FY 2026, \$10.813 million is budgeted in this program for 53 direct Full-Time Equivalent (FTE) civilians. The Air Force Research Laboratory (AFRL) utilizes 10 USC 4091, "Authorities for certain positions at science and technology reinvention laboratories" to manage the workforce strength, structure, positions, and compensation.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force				Date: June 2025	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
3600: Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research		PE 0602298F I Science and Technology Management - Major Headquarters Activities			
B. Program Change Summary (\$ in Millions)	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Previous President's Budget	10.303	9.662	9.840	0.000	9.840
Current President's Budget	10.303	9.662	10.813	0.000	10.813
Total Adjustments	0.000	0.000	0.973	0.000	0.973
• 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	0.973	0.000	0.973
Change Summary Explanation					
The FY 2026 request for 0602298F has a net increase of \$0.973. The overall increase included a \$0.918 million reduction for workforce optimization and a \$1.891 million increase for updated average work year costs.					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602298F / <i>Science and Technology Management - Major Headquarters Activities</i>				Project (Number/Name) 622520 / <i>Science and Technology Management - Major HQ</i>			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
622520: <i>Science and Technology Management - Major HQ</i>	0.000	10.303	9.662	10.813	0.000	10.813	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

The Air Force Research Laboratory (AFRL) is a global technical enterprise, boasting some of the best and brightest leaders in the world. It provides revolutionary, relevant, and responsive science and technology (S&T) to the Warfighter. AFRL's mission is to lead the discovery, development, and integration of affordable warfighting technologies for the global air, space, and cyberspace force.

<u>B. Accomplishments/Planned Programs (\$ in Millions)</u>	FY 2024	FY 2025	FY 2026
<i>Title:</i> AFRL - Major Headquarters Activities <i>Description:</i> Provide professional government civilian workforce in support of all AFRL programs and activities. <i>FY 2025 Plans:</i> Provide professional government civilian workforce in support of all AFRL programs and activities. <i>FY 2026 Plans:</i> Continue to provide professional government civilian workforce in support of all AFRL programs and activities. <i>FY 2025 to FY 2026 Increase/Decrease Statement:</i> FY 2026 funding increased compared to FY 2025 by \$1.151 million due to civilian pay reprice adjustments.	10.303	9.662	10.813
Accomplishments/Planned Programs Subtotals	10.303	9.662	10.813

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

N/A

Remarks

D. Acquisition Strategy

Not Applicable

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force	Date: June 2025

Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
3600: <i>Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research</i>					PE 0602336F / <i>Nuclear Delivery Systems Tech Exploration</i>							
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
Total Program Element	0.000	0.000	0.000	4.969	0.000	4.969	-	-	-	-	-	-
623360: <i>Technology Exploration</i>	0.000	0.000	0.000	4.969	0.000	4.969	-	-	-	-	-	-

Note

Effective FY 2026, nuclear system technology efforts under Aerospace Vehicle Technologies (PE 0602201F, Project 625172) will transfer to Nuclear Delivery Systems Technology Exploration (PE 0602336F, Project 623360) to enhance transparency and traceability of the nuclear Science & Technology portfolio.

A. Mission Description and Budget Item Justification

The Air Force Research Laboratory (AFRL) is focused on high-impact, multi-domain science and technology (S&T) solutions that drive innovation now while laying the groundwork for the Air and Space Forces to win the future fight. The AFRL effectively synchronizes the Department of the Air Force (DAF) S&T enterprise and workforce to align towards the most consequential DAF priorities and accelerate the delivery of game-changing S&T.

The Nuclear Delivery Systems Technology Exploration program establishes the foundational computational tools necessary to conduct nuclear forensics, perform potential strategic surveillance, and predict future nuclear re-entry system environmental effects and responses. Program activities aid investigations and analyses of national strategic and nuclear deterrence operations; foreign low yield or evasive underground nuclear tests; and multi-physics algorithms to accurately simulate untested environmental effects and responses in support of nuclear reentry systems development activities in Program Element 0603273F (Science & Technology for Nuclear Reentry Systems). This program provides applied Science & Technology to reestablish nuclear deterrence operations by reestablishing specialized expertise and modernizing the infrastructure and technologies necessary to address, and respond to, current and emerging multi-peer-contested nuclear environments.

This program further supports the requisite DAF Science & Engineering mission enabling civilian workforce with the necessary technical competencies to develop, manage, and deliver Science & Technology capabilities. The use of program funds in this Program Element is aligned with the civilian pay expenses budgeted for in the following program elements: 1206601SF, 0601102F, 0602020F, 0602102F, 0602202F, 0602203F, 0602204F, 0602298F, 0602602F, 0602605F, 0602788F, and 0603680F. In FY 2026, \$1.615 million is budgeted in this program for 8 direct Full-Time Equivalent civilians. The Air Force Research Laboratory references statutory language under 10 USC 4091 ("Authorities for certain positions at Science & Technology reinvention laboratories") to manage the workforce strength, structure, positions, and compensation.

This program element may include necessary expenses to support operation and maintenance activities to manage, execute, and deliver science and technology capabilities.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force				Date: June 2025		
Appropriation/Budget Activity		R-1 Program Element (Number/Name)				
3600: Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research		PE 0602336F I Nuclear Delivery Systems Tech Exploration				
B. Program Change Summary (\$ in Millions)	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	
Previous President's Budget	0.000	0.000	0.000	0.000	0.000	
Current President's Budget	0.000	0.000	4.969	0.000	4.969	
Total Adjustments	0.000	0.000	4.969	0.000	4.969	
• Congressional General Reductions	0.000	0.000				
• Congressional Directed Reductions	0.000	0.000				
• Congressional Rescissions	0.000	0.000				
• Congressional Adds	0.000	0.000				
• Congressional Directed Transfers	0.000	0.000				
• Reprogrammings	0.000	0.000				
• SBIR/STTR Transfer	0.000	0.000				
• Other Adjustments	0.000	0.000	4.969	0.000	4.969	
Change Summary Explanation						
FY 2026 increased compared to FY 2025 by \$4.969 million due to a transfer of effort from Program Element 0602201F, Aerospace Vehicle Technologies, Project 625172 Nuclear System Technology, in order to enhance transparency and traceability of the nuclear Science & Technology portfolio.						
The FY 2026 request was reduced by \$0.500 million for Advisory and Assistance Services to promote efficiencies and advance the policies of the Administration in alignment with Executive Order 14222, "Implementing the President's Department of Government Efficiency Cost Efficiency Initiative."						
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2024	FY 2025	FY 2026
Title: Nuclear Technologies				-	0.000	4.969
Description: Develop the foundational computational technologies, tools, and capabilities necessary to support the investigation and analyses of national strategic and nuclear deterrence operations; multi-physics algorithms to accurately simulate untested environmental effects and responses that future nuclear re-entry systems will experience; and potential foreign low-yield or evasive underground nuclear tests.						
FY 2025 Plans: FY 2025 plans are captured under Aerospace Vehicle Technologies (PE 0602201F, Project 625172). Effective FY 2026, nuclear system technology efforts under Aerospace Vehicle Technologies (PE 0602201F, Project 625172) transfer to Nuclear Delivery Systems Technology Exploration (PE 0602336F, Project 623360) to enhance transparency and traceability of nuclear Science & Technology activities.						
FY 2026 Plans: - Continue developing nuclear re-entry system Modeling & Simulation supporting efforts in PE 0603273F (Science & Technology for Nuclear Re-entry System).						

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research</i>		R-1 Program Element (Number/Name) PE 0602336F / <i>Nuclear Delivery Systems Tech Exploration</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Continue utilizing novel models and statistical methods to provide uncertainty quantification to better discern and evaluate yield estimation performance for local and regional seismic events. - Continue developing machine learning algorithms for seismic signal and array processing to enhance near real-time event detection and discrimination tools. - Continue developing machine learning for distributed acoustic sensing for noise reduction, detection, data compression, and source characterization to enhance seismic monitoring, including applications to non-seismic signals. - Continue developing novel methods for faster, more accurate, automated processing of non-seismic data to enhance nuclear explosion monitoring capabilities. - Initiate plans and resourcing strategy for the extension of novel methods and algorithms development for processing non-seismic data for multi-domain moving target indicator detection and tracking. - Continue advancing and linking 3D source simulations, linear wave propagation simulations, and earth structure models to enhance prediction capabilities for improved discrimination and characterization of seismic events. - Continue aerothermal model validation and improvements to include the development of integrated, comprehensive physics-based modeling suites to predict aerodynamic flow fields, signatures, and material characterizations. - Continue enhancing plasma chemistry modeling fidelity through machine learning models and computational chemistry. - Continue developing computational tools for predicting physics-based effects that result in leading-edge shape change of hypersonic vehicles. - Continue weather effects testing on re-entry vehicles to gather data for validating current modeling and simulation tools, and for generating new algorithms used in predicting re-entry vehicle responses to extreme or inclement weather in the lower atmosphere. - Continue analyzing strategic command, control, and communications to identify multi-domain technologies of interest. - Continue developing test and integration plans for hypersonic re-entry flight tests containing government payloads. - Continue developing hypersonic technology payloads (e.g., inertial sensors, millimeter-wave communications, spectral and hyperspectral sensors, and heatshield materials) for technology maturation opportunities in future flight tests. - Continue validating computational results of hypersonic aerothermal chemistry and shock-layer behavior with experimental reentry flight test data. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$4.969 million due to a transfer of effort from Program Element 0602201F, Aerospace Vehicle Technologies, Project 625172 Nuclear System Technology, in order to enhance transparency and traceability of the nuclear Science & Technology portfolio.				
Accomplishments/Planned Programs Subtotals		-	0.000	4.969

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force										Date: June 2025	
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research					R-1 Program Element (Number/Name) PE 0602336F I Nuclear Delivery Systems Tech Exploration						
D. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
• RDTE 02 0602201F: Aerospace Vehicle Technologies	12.922	15.235	-	-	-	-	-	-	-	-	-
• RDTE 03 0603211F: Aerospace Technology Dev/Demo	88.628	0.000	-	-	-	-	-	-	-	-	-
• RDTE 03 0603273F: Science & Technology for Nuclear Re-entry Systems	65.088	91.885	128.407	-	128.407	-	-	-	-	-	-
Remarks											
E. Acquisition Strategy											
N/A											

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force	Date: June 2025

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research</i>	R-1 Program Element (Number/Name) PE 0602602F <i>I Conventional Munitions</i>

COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
Total Program Element	0.000	149.962	142.497	125.102	0.000	125.102	-	-	-	-	-	-
622068: <i>Advanced Guidance Technology</i>	0.000	82.398	76.734	63.172	0.000	63.172	-	-	-	-	-	-
622502: <i>Ordnance Technology</i>	0.000	67.564	65.763	61.930	0.000	61.930	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This program investigates, develops, and establishes the technical feasibility and military utility of guidance and ordnance technologies for conventional munitions. The effort supports core technical competencies of munitions aerodynamics, guidance, navigation, and control; terminal seeker sciences; fuze technology; energetic materials; damage mechanisms; and munition systems effects. Technologies and associated models and simulation assets to be developed include seekers that provide high-confidence target discrimination and classification with precise target location and robust terminal tracking; navigation technologies that do not rely upon the Global Positioning System (GPS); blast, fragmentation, penetrating, low-collateral-damage, and multi-mission warheads; collaborative, synchronized fuzing; and high-performance and insensitive explosives.

Funds in this PE may be used to investigate specified technology advancements in air, space and/or cyber domains.

The Air Force Research Laboratory (AFRL) is focused on high-impact, multi-domain science & technology (S&T) solutions that drive innovation now while laying the groundwork for the Air and Space Force to win the future fight. AFRL effectively synchronizes the Department of the Air Force (DAF) S&T enterprise and workforce to align towards the most consequential DAF priorities and accelerate the delivery of game-changing S&T.

This program includes funding for the requisite DAF Science & Engineering (S&E) and mission enabling civilian workforce with the necessary technical competencies to develop, manage, and deliver science & technology capabilities. The use of program funds in this program element is in conjunction with the civilian pay expenses budgeted in the following program elements: 1206601SF, 0601102F, 0602020F, 0602102F, 0602202F, 0602203F, 0602204F, 0602298F, 0602336F, 0602605F, 0602788F, and 0603680F. In FY 2026, \$49.406 million is budgeted in this program for 257 direct Full-Time Equivalent (FTE) civilians. The Air Force Research Laboratory (AFRL) utilizes 10 USC 4091, "Authorities for certain positions at science and technology reinvention laboratories" to manage the workforce strength, structure, positions, and compensation.

This program element may include necessary expenses to support the operation and maintenance of facilities to manage, execute, and deliver science and technology capabilities.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force				Date: June 2025	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
3600: Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research		PE 0602602F I Conventional Munitions			
B. Program Change Summary (\$ in Millions)	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Previous President's Budget	160.599	138.497	132.450	0.000	132.450
Current President's Budget	149.962	142.497	125.102	0.000	125.102
Total Adjustments	-10.637	4.000	-7.348	0.000	-7.348
• Congressional General Reductions	-1.275	0.000			
• Congressional Directed Reductions	-10.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	10.000	4.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-2.938	0.000			
• Other Adjustments	-6.424	0.000	-7.348	0.000	-7.348
Congressional Add Details (\$ in Millions, and Includes General Reductions)					
Project: 622068: Advanced Guidance Technology				FY 2024	FY 2025
Congressional Add: Program increase - University-led hyper-velocity test capability				0.000	4.000
Congressional Add Subtotals for Project: 622068				0.000	4.000
Project: 622502: Ordnance Technology					
Congressional Add: Convergence technology research				9.892	0.000
Congressional Add Subtotals for Project: 622502				9.892	0.000
Congressional Add Totals for all Projects				9.892	4.000
Change Summary Explanation					
Decrease FY 2024 funding of \$6.424 million in Other Adjustment was for realignment of funds to PE 0602212F, Defense Laboratories R&D Projects, to implement the Department of Defense (DoD) Funding Laboratory Enhancements Across Four Categories (FLEX-4) authority under 10 U.S.C. Section 4123.					
Decrease in FY 2024 funding of \$10.000 million due to excess growth.					
Increase in FY 2024 funding of \$10.000 million for congressional add program increase - Convergence Technology Research.					
Increase in FY 2025 funding of \$4.000 million for congressional add program increase - University-led Hyper-velocity test capability.					

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research	R-1 Program Element (Number/Name) PE 0602602F I Conventional Munitions	
Decrease in FY 2026 funding of \$4.021 million reflects a strategic realignment to optimize core research areas and improve resource efficiency. The FY 2026 request was reduced by \$5.563 million for civilian personnel to optimize the workforce in compliance with Executive Order 14210, "Implementing the President's Department of Government Efficiency Workforce Optimization Initiative." The FY 2026 request was reduced by \$0.965 million for Advisory and Assistance Services to promote efficiencies and advance the policies of the Administration in alignment with Executive Order 14222, "Implementing the President's Department of Government Efficiency Cost Efficiency Initiative."		

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602602F / Conventional Munitions				Project (Number/Name) 622068 / Advanced Guidance Technology			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
622068: Advanced Guidance Technology	0.000	82.398	76.734	63.172	0.000	63.172	-	-	-	-	-	-
A. Mission Description and Budget Item Justification												
This project investigates, develops, and evaluates conventional munitions guidance technologies to establish technical feasibility and military utility of innovative munition seekers, weapon aerodynamics, navigation and control, and guidance subsystem integration/simulation. Project payoffs include adverse-weather, Global Positioning System (GPS)-degraded and Global Positioning System-denied, networked, and autonomous precision munition guidance capability; increased number of kills per sortie; increased aerospace vehicle survivability; improved weapon reliability and affordability; and improved weapon survivability and effectiveness.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2024	FY 2025	FY 2026	
Title: Seeker Technologies									15.840	14.579	12.662	
Description: Develops seeker technologies for munitions to provide high-confidence target discrimination and classification, precise target location, and robust terminal tracking.												
FY 2025 Plans:												
- Continue emphasizing technology development of multi-function sensors, biology-inspired information processing and data fusion, and low-power computation.												
- Continue developing technologies that simplify, increase flexibility, and reduce the cost of advanced seeker concepts.												
- Continue to develop algorithmic approaches integrating weapons into the kill chain to enable distributive, flexible seeker targeting with or without an operator in the loop.												
- Effort completed for seeker algorithm development, modeling, simulation, and testing of innovative engagement methods to enable targeting of adversary fifth-generation threat aircraft. Upon completion analysis and reports provided to munitions program offices.												
- Continue development of weapon radomes and apertures to improve transmission and optical performance while increasing protection from severe operational environments.												
- Effort complete in FY 2025 for exploring sparse sensing and compressive sensing techniques for seeker cost reduction with performance improvement. Upon Completion we will conclude the research on compressive sensing and neuromorphic processing.												
- Effort complete for research on integrated processing techniques to enable networked systems. Upon Completion we expect delivery and test of prototype microwave array technology for reconfigurable integrated circuits seeker processing assemblies.												
- Continue and expand research into multi-function radio frequency (RF) system development for multiple RF applications on weapons as well as to enable novel coherent RF multi-weapon functions.												
- Effort complete for open seeker architecture integration into the weapon open system architecture and evaluate the impact with respect to cyber vulnerability. Upon completion we plan on resolving errata discovered during demonstrations of the Open Seeker												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602602F / <i>Conventional Munitions</i>		Project (Number/Name) 622068 / <i>Advanced Guidance Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
Architecture (OSA) and base-lining of OSA as a part of the Weapons Open System Architecture (WOSA) Initial Capabilities Document (ICD). - Effort complete for development and demonstration of coherent collaborative radio frequency seeker operation. Upon Completion we plan on a collaborative effort to mature coherent radio frequency (RF) system relative position and timing synchronization challenges in support of Networked Collaborative Autonomous (NCA) weapons. FY 2026 Plans: - Continue seeker technology development of multi-function sensors, biology-inspired information processing, data fusion, and low-power computation. To provide improvements in the performance and Cost, Size, Weight, and power of future munitions and intelligence, surveillance, reconnaissance (ISR) systems. - Continue developing technologies that simplify, increase flexibility, and reduce the cost of advanced seeker concepts. To enable the development of next generation seekers will have greater precision at longer range and lower cost. - Continue to develop algorithmic approaches integrating weapons into the kill chain. To enable distributive, flexible seeker targeting. - Continue development of weapon radomes and apertures. To improve transmission and optical performance while increasing protection from severe operational environments. - To enable the development for multiple RF applications on weapons as well as to enable novel coherent functions. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$1.917 million due to programmatic adjustments for RF/Electro-Optical (EO)/IR Seeker Technologies. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency.					
Title: Aerodynamics, Navigation, and Control Technologies Description: Develops weapon aerodynamic control, navigation, and networking technologies for munitions to provide precise, agile flight, networked effects, and resiliency against countermeasures. FY 2025 Plans: - Continue novel position, navigation and timing technology development for global positioning system denied environments with intent to insert into demonstration programs. - Continue investigation of cooperative, autonomous, and collaborative weapon behaviors to develop robust algorithms and swarming play-books. - Continue experiments demonstrating precision navigation, emphasizing cruise missile, form-factored optics and tracker for celestial-aided navigation at supersonic cruise missile speeds and trajectory. - Continue flight testing of articulating head missile at supersonic speeds at full scale to include analysis of range extension through airframe morphing and articulation.			37.584	32.610	28.323

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602602F / <i>Conventional Munitions</i>		Project (Number/Name) 622068 / <i>Advanced Guidance Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
- Continue kinetic and electronic attack swarm plays incorporating cyber domain, electronic warfare, and kinetic effects. - Effort complete for flight demonstration of network-aided navigation autonomy play-book. Upon completion analysis and reports provided to munitions program offices. - Continue machine learning to develop tactics for multi-weapon engagements. - Continue synthetic aperture radar-based alternative-navigation technology investigation. - Continue post-weapon deployment data analytics to improve guidance, navigation, and controls models and autonomy tactics. - Initiate flight demonstration of networked collaborative autonomy plays and tactics for survivability and lethality in contested environments. FY 2026 Plans: - Continue novel position, navigation and timing technology for weapons. To develop navigation denied environments with intent to insert into demonstration for weapon programs. - Continue investigation of cooperative, autonomous, and collaborative weapon behaviors. To develop robust algorithms and swarming weapon play-books for weapons guidance increasing mission performance and survivability. - Continue experiments demonstrating precision navigation, emphasizing cruise missile, form-factored optics and tracker for celestial-aided navigation at supersonic speeds and trajectory. To develop mission and cost, size, weight, and power navigation solutions for constrained/denied navigation environments. - Continue flight testing of articulating head missile at supersonic speeds at full scale to include analysis of range extension through airframe morphing and articulation. To develop computational tools, material database, wind tunnel models, and expertise to rapidly develop new high-speed weapons technology. - Continue kinetic and electronic attack swarm plays incorporating cyber domain, electronic warfare, and kinetic effects. To develop collaborative multi-agent maneuver algorithms increasing battle state awareness and engagements. - Continue computational intelligence effort to develop tactics for multi-weapon engagements. To develop and test computational intelligence algorithms that can increase the capability and performance of a weapon. - Continue synthetic aperture radar-based alternative-navigation technology investigation. To develop mission and cost, size, weight, and power navigation solutions for constrained/denied navigation environments. - Continue post-weapon deployment data analytics to improve guidance, navigation, and controls models and autonomy tactics. To develop and test computational intelligence algorithms that can increase the capability and performance of a weapons guidance and control. - Continue flight demonstration of networked collaborative autonomy plays and tactics for survivability and lethality in contested environments. To develop collaborative multi-agent maneuver algorithms increasing battle state awareness and engagement. - Initiate software enabled weapons research focused on accelerating data-driven weapon software updates. To focus on accelerating data-driven weapon software updates. FY 2025 to FY 2026 Increase/Decrease Statement:					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602602F / <i>Conventional Munitions</i>	Project (Number/Name) 622068 / <i>Advanced Guidance Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
FY 2026 decreased compared to FY 2025 by \$4.287 million due to programmatic adjustments for Munitions Aerodynamics, Navigation and Control Technologies. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency.			
Title: Guidance Technologies Description: Develops guidance subsystem integration and evaluation technologies to provide open and closed-loop ground testing, flight test risk reduction, and digital simulation of novel concepts. FY 2025 Plans: - Continue development of cruise missile behaviors for distributed, cooperative, collaborative strategies and other advanced guidance capabilities. - Continue improvement of constructive and virtual analysis tools for design, development, and analysis of advanced missile concepts in representative environments. - Continue engagement-level analysis on high-speed and air-to-air weapon concepts providing design, performance, and trade-space analysis to the munitions program offices. - Continue improvement of simulation technologies evaluating innovative air-to-air and air-to-surface engagements to include guidance and control evaluation. - Continue inclusion of additional targets and improved terrain resolution to radar, millimeter wave, infrared, and ultraviolet signature generation capability for testing algorithms in real-time software and hardware in-the-loop environments. - Continue development of high-speed hardware-in-the-loop simulation technology, including thermal environment, aerodynamic control uncertainty, seeker modeling, and alternative navigation sensor effectiveness. - Continue development of infrared light-emitting diode target simulator technology to create higher frame rate and higher resolution target simulator technology. - Continue providing weapon-oriented multi-security level, cross-domain distributed modeling and simulation support using distributed connectivity between Eglin Air Force Base facilities and other geographic locations. - Effort complete for development of 6-degrees of freedom and scene generation modules for the extended modeling and simulation community using Air Force Simulator. Upon Completion incorporating 3D machine learning for plume interpolation and delivery of prototype global scene generation through multiple Small Business Innovation Research (SBIR) projects. - Continue hardware-in-the-loop activities in support of international cooperative research efforts. FY 2026 Plans: - Continue development of cruise missile behaviors for distributed, cooperative, collaborative strategies and other advanced guidance capabilities. To develop collaborative multi-agent maneuver algorithms increasing battle state awareness and engagement. - Continue improvement of constructive and virtual analysis tools for design, development, and analysis of advanced missile concepts in representative environments. To develop Hardware/software-in-the-loop technology used for weapons evaluation.		28.974	25.545
			22.187

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602602F / <i>Conventional Munitions</i>		Project (Number/Name) 622068 / <i>Advanced Guidance Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
- Complete engagement-level analysis on high-speed and air-to- air weapon concepts providing design, performance, and trade-space analysis to the munitions program offices. To develop Hardware/software-in-the-loop technology used for weapons evaluation. Upon completion analysis and reports provided to munitions program offices. - Continue improvement of simulation technologies evaluating innovative air-to-air and air-to-surface engagements to include guidance and control evaluation. To develop Hardware/software-in-the-loop technology used for weapons evaluation. Activities include continuing development of an automated multi-disciplinary design optimization capability using evolutionary algorithms and advancing the Missile Data Compendium documentation and codebase. Initiate maritime interdiction closed loop guidance simulation capability. - Continue inclusion of additional targets and improved terrain resolution to radar, millimeter wave, infrared, and ultraviolet signature generation capability for testing algorithms in real-time software and hardware in-the-loop environments. To develop Hardware/software-in-the-loop technology used for weapons evaluation. - Continue development of high-speed hardware-in-the-loop simulation technology, including thermal environment, aerodynamic control uncertainty, seeker modeling, and alternative navigation sensor effectiveness. To develop Hardware/software-in-the-loop technology used for weapons evaluation. - Continue development of infrared light-emitting diode target simulator technology to improve target simulator frame rate and resolution. To develop weapon seeker technologies to enable the next generation of precision guided munitions to attack targets in contested environments. - Continue providing weapon-oriented multi-security level, cross-domain distributed modeling and simulation support using distributed connectivity between Eglin Air Force Base facilities and other geographic locations. To develop Hardware/software-in-the-loop technology used for weapons evaluation. - Continue hardware-in-the- loop activities in support of international cooperative research efforts. To develop Hardware/software-in-the-loop technology used for weapons evaluation.					
FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$3.358 million due to programmatic adjustments in virtual and physical environments modeling and simulation for Guidance Technologies. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency.					
Accomplishments/Planned Programs Subtotals			82.398	72.734	63.172
			FY 2024	FY 2025	
Congressional Add: Program increase - University-led hyper-velocity test capability			0.000	4.000	

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602602F / <i>Conventional Munitions</i>	Project (Number/Name) 622068 / <i>Advanced Guidance Technology</i>	
		FY 2024	FY 2025
FY 2024 Accomplishments: Not applicable			
FY 2025 Plans: Conduct Congressionally directed efforts.			
Congressional Adds Subtotals		0.000	4.000

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

N/A

Remarks

D. Acquisition Strategy

Not Applicable

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602602F / Conventional Munitions				Project (Number/Name) 622502 / Ordnance Technology			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
622502: Ordnance Technology	0.000	67.564	65.763	61.930	0.000	61.930	-	-	-	-	-	-
A. Mission Description and Budget Item Justification												
This project investigates, develops, and evaluates conventional ordnance technologies to establish technical feasibility and military utility for advanced explosives, fuzes, warheads, sub-munitions, and weapon airframes, carriage, and dispensing. The project also assesses the lethality and effectiveness of current and planned conventional weapons technology programs and assesses target vulnerability. The payoffs include improved storage capability and transportation safety of fully assembled weapons, improved warhead and fuze effectiveness, improved sub-munitions dispensing, low-cost airframe/subsystem components and structures, and reduced aerospace vehicle and weapon drag.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2024	FY 2025	FY 2026	
Title: Energetic Materials Technology									7.495	8.730	8.221	
Description: Investigates and develops energetic materials and technology that safely and securely optimize survivability, cost, and weapon lethality for munitions.												
FY 2025 Plans:												
- Complete advancement and development of selected energetic materials, specifically nano-intermetallic compounds, to increase energy density over traditional explosives while enhancing damage mechanisms and lethality for mass and volume-constrained applications. Upon completion, transition new ingredient technologies into formulation efforts.												
- Continue building and implementing experimental techniques/capabilities to quantify dynamic and mechanical properties as well as survivability of energetic materials in extreme temperature and vibrational environments.												
- Continue development of tools and analysis techniques to further the understanding of energy partitioning between blast/fragmentation and combined effects to optimize lethality against a broad spectrum of targets.												
- Complete maturation of additive manufacturing techniques to increase the design space for kinetic weapon lethality and to facilitate distributed manufacturing processes. Upon completion, report concepts to Warhead technology group for potential consideration in ordnance testing												
- Continue formulation of novel explosive fill to satisfy severe environmental constraints.												
- Continue development of large-scale nano-energetic material fabrication.												
- Initiate maturation of novel Energetics for Advanced Shaped Charges.												
- Initiate research of Electrical and Electromagnetic Effects in Explosives.												
- Initiate development of Digital Engineering of Energetic Material Systems.												
- Initiate development of Aging prediction models in energetic system of systems.												
FY 2026 Plans:												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602602F / Conventional Munitions	Project (Number/Name) 622502 / Ordnance Technology		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
- Continue building and implementing experimental techniques/capabilities to quantify dynamic and mechanical properties as well as survivability of energetic materials in extreme temperature and vibrational environments. To model energetic materials technology that maximizes weapon lethality, survivability, effectiveness and safety for air-delivered munitions. - Continue development of tools and analysis techniques to further the understanding of energy partitioning between blast/fragmentation and combined effects to optimize lethality against a broad spectrum of targets. To provide operational weaponeering tools with robust lethality analyses and informed/efficient decision-making tools to enhance strategic planning. - Continue formulation of novel explosive fill balanced to satisfy severe environmental constraints and have acceptable performance. To discover and develop energetic materials technology that maximizes weapon lethality, survivability, effectiveness and safety for air-delivered munitions. - Continue development of large-scale nano-energetic material fabrication. To develop, integrate, model, and transition energetic materials technology that maximizes weapon lethality, survivability, effectiveness and safety for air-delivered munitions. - Continue maturation of novel Energetics for Advanced Shaped Charges for smaller/higher efficiency effects. To model energetic materials technology that maximizes weapon lethality, survivability, effectiveness and safety for air-delivered munitions. - Continue research of Electrical and Electromagnetic Effects in Explosives for understanding and exploiting detonation/initiation sensitivity for dynamic ordnance effects. To develop evolving ordnance concepts necessary to build a more lethal force. - Continue development of design capability for Digital Engineering of Energetic Material Systems to optimize survivability and performance of ordnance concepts. To model energetic materials technology that maximizes weapon lethality, survivability, effectiveness and safety for air-delivered munitions. - Continue development of aging prediction models in energetic system of systems in order to enable model-justified munition service life extensions. To model energetic materials technology that maximizes weapon lethality, survivability, effectiveness and safety for air-delivered munitions. - Initiates development of CL-20 based explosives to increase lethality and range of advance munitions. To develop, integrate, model, and transition energetic materials technology that maximizes weapon lethality, survivability, effectiveness and safety for air-delivered munitions. - Initiates qualification of new combined effects explosives for enhancing damage mechanisms and lethality for mass and volume-constrained applications. To develop, integrate, model, and transition energetic materials technology that maximizes weapon lethality, survivability, effectiveness and safety for air-delivered munitions.					
FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$0.509 million due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency.					
Title: Fuze Technologies			7.650	8.902	8.383
Description: Investigate and develop fuzing technology for weapons to ensure reliable and optimal function to maximize weapon lethality for all engagement scenarios.					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602602F / <i>Conventional Munitions</i>	Project (Number/Name) 622502 / <i>Ordnance Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
FY 2025 Plans: - Continue implementation of digital engineering tools to enable digital design of munition fuzes. - Continue development and demonstration of alternative packaging technology for survivable fuze electronic components in weapon systems designed for multi-mission purpose. - Continue investigating the reliability and survivability of electronic components for prediction and measurement of fuze performance during munition penetration at high-impact speeds. - Continue research facilitating tailored lethal effects that enable optimum fuzing solutions across the spectrum of weapon and target interactions as enabling technologies for agile weapon effect concepts. - Continue research for distributed and multi-point fuzing concepts as enabling technologies for agile weapon effect concepts. Include design and development of a fuzes capable of surviving and reliably functioning in counter maritime scenarios: onset of weapon detonation on the surface, within, or beneath a maritime vessel to give warfighter flexibility in mission solutions. - Continue implementing additive manufacturing techniques to increase fuze reliability and to facilitate distributed manufacturing. Advance to enable frequency selective surfaces on curved surfaces to increase fuze sensor rejection of interference. - Continue fuze explosive interfaces analysis for robust definition of explosive train reliability and performance. - Continue fuze endgame, active imaging for target detection and aim point selection. - Initiate advances in sensor materials for radar and infrared that allows increased performance in reduced size, weight, and power for greater for agile, small, networked weapons and in harsh environments. FY 2026 Plans: - Continue implementation of digital engineering tools to enable digital design of munition fuzes. To develop optimized fuze and explosive system for increased survivability and necessary lethality in maritime targets. - Continue development and demonstration of alternative packaging technology. To develop survivable fuze electronic components in weapon systems designed for multi-mission purpose. - Continue investigating the reliability and survivability of electronic components. To predict and measure fuze performance during munition penetration at high-impact speeds. - Continue research facilitating tailored lethal effects. To enable optimum fuzing solutions across the spectrum of weapon and target interactions as enabling technologies for agile weapon effect concepts. - Continue research for distributed and multi-point fuzing concepts as enabling technologies for agile weapon effect concepts. To enable the design and development of a fuzes capable of surviving and reliably functioning in maritime interdiction scenarios. - Continue implementing additive manufacturing techniques to increase fuze reliability and to facilitate distributed manufacturing. To develop modernized manufacturing capabilities and evolving ordnance concepts necessary to build a more lethal force. - Continue fuze explosive interfaces analysis for robust definition of explosive train reliability and performance. To develop optimized fuze and explosive system for increased survivability and necessary lethality in maritime targets. - Continue fuze endgame, active imaging for target detection and aim point selection. To develop robust radar system architectures for prosecuting moving and relocatable targets in multiple adverse scenarios.			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602602F / <i>Conventional Munitions</i>	Project (Number/Name) 622502 / <i>Ordnance Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Continue advances in sensor materials for radar and infrared that allows increased performance in reduced size, weight, and power for greater for agile, small, networked weapons and in harsh environments. To develop increased performance in reduced size, weight, and power for greater more agile, small, networked weapons and in harsh environments. - Initiate exploration to utilize wireless fuze concept in explosive system. To discover emerging and pervasive ordnance fuzing technologies. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$0.519 million due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency.			
Title: Warhead Technologies Description: Investigate and develop innovative warhead kill mechanisms for weapons that maximize weapon lethality for all engagement scenarios. FY 2025 Plans: - Continue maturation of small, multi-output warhead technologies for soft-surface targets, to include limited penetration capability of surface-hardened structures and maritime targets. - Continue evolving test capabilities to enhance quantification of the mechanical response under high-rate, high-pressure loading conditions for use in high-fidelity modeling and simulation tools, to include materials used in additive manufacturing processes, enabling digital engineering of warhead concepts. Include testing for conditions meeting maritime target data needs for models. - Continue developing additive manufacturing techniques and produce optimized sub-scale articles for test. Expand material selections through partnerships within DoD. - Continue demonstration of technologies for effective and survivable high-speed penetration, specifically focusing on maritime and surface targets relevant to Joint Warfighting Concept in all domains. Includes warhead capable of surviving and reliably functioning in all counter maritime scenarios: weapon function capability on vessel surface, perforate and function within vessel, complete perforation through vessel and function when beneath vessel, or direct penetration through water to function underneath a vessel. Intent is to give warfighter flexibility in mission solutions. - Continue development of warhead concepts for the air targets in peer engagement scenarios. - Continue research and develop cumulative damage mechanisms taking advantage of coordinated and distributed impact. - Continue subsystem warhead technology integration. FY 2026 Plans: - Continue maturation of small, multi-output warhead technologies for soft-surface targets, to include limited penetration capability of surface-hardened structures and maritime targets. To enable more weapons on carrier per sortie while sustaining or enhancing lethality.		10.785	12.393
			11.671

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602602F / Conventional Munitions	Project (Number/Name) 622502 / Ordnance Technology		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Continue evolving test capabilities to enhance quantification of the mechanical response under high-rate, high-pressure loading conditions for use in high-fidelity modeling and simulation tools, to include materials used in additive manufacturing processes. To enable digital engineering of warhead concepts. - Continue developing additive manufacturing techniques and produce optimized sub-scale articles for test. Expand material selections through partnerships within DoD. To develop warhead applications in air-delivered weapons. - Continue demonstration of technologies for effective and survivable high-speed penetration, specifically focusing on maritime and surface targets relevant to Joint Warfighting Concept in all domains. To discover and develop defined requirements for warhead to function in each of the maritime scenarios. - Continue development of warhead concepts for the air targets in peer engagement scenarios. To develop innovative warhead concepts for weapons that maximize weapon lethality for all engagement scenarios. - Continue research and development of cumulative damage mechanisms taking advantage of coordinated and distributed impact. To develop cumulative damage mechanisms in maritime targets. - Continue subsystem technology integration into warheads for maritime target engagements. To focus on optimized warhead technology integration through development, application, and refinement of digital engineering and model-based engineering architectures and tools. - Initiate rapid-design and modular warhead into low-cost cruise missile concepts with DoD partner. To develop innovative warhead concepts for weapons that maximize weapon lethality for all engagement scenarios. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$0.722 million due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency.				
Title: Ordnance Technologies Description: Investigate and develop ordnance sub-system (energetics, fuzes and war-heads) and integrated system concepts using both high-fidelity and fast-running engineering level Modeling and Simulation tools. FY 2025 Plans: - Continue developing validated mesoscale modeling and simulation tools for computational physics sciences. - Continue to develop engineering-level simulation architecture capability to enable weapon sub-system and system-level technology assessments. - Continue implementing cost-effective and rapid- transition warhead technologies for inventory weapons. - Continue modeling and simulation efforts exploring the ordnance technology trade-space for low-cost, long-range munition concepts. - Continue developing predictive techniques for munition effectiveness tools used in concept development and assessment as well as studies involving analysis of alternatives.		31.742	35.738	33.655

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602602F / <i>Conventional Munitions</i>		Project (Number/Name) 622502 / <i>Ordnance Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
- Continue developing test capability and data collection for modeling and simulation tools to characterize lethality, survivability, and performance of sub-systems and integrated ordnance systems. - Continue investigation of machine learning technologies for ordnance. - Continue exploring the connection of ordnance modeling and simulation and lethality tools to the broader digital engineering ecosystem. - Initiate development and maturation of a mini-Joint Simulation Environment (JSE) node to conduct analysis at mission/campaign level for evaluation of munition research to optimize S&T investments to meet warfighter needs. - Initiate development and integration of maritime lethality analysis and assessment tools for air-delivered weapons delivered by the warfighter in three counter maritime scenarios. FY 2026 Plans: - Continue developing validated mesoscale modeling and simulation tools for computational physics sciences application of ordnance performance and aging. To develop evolving ordnance concepts necessary to build a more lethal force. - Continue to develop ordnance engineering-level simulation architecture capabilities. To enable weapon sub-system and system-level technology assessments. - Continue implementing cost-effective and rapid- transition warhead technologies for inventory weapons. To enable weapons affordable mass. - Continue modeling and simulation efforts exploring the ordnance technology trade-space for low-cost, long-range munition concepts. To develop evolving ordnance concepts necessary to build a more lethal force. - Continue developing predictive techniques for munition effectiveness tools used in concept development and assessment as well as studies involving analysis of alternatives. To investigate and develop ordnance sub-system (energetics, fuzes, and warheads) and integrated system concepts using modeling and simulation tools. - Continue developing test capability and data collection for modeling and simulation tools to characterize lethality, survivability, and performance of sub-systems and integrated ordnance systems. To investigate and develop ordnance sub-system (energetics, fuzes, and warheads) and integrated system concepts using modeling and simulation tools. - Continue investigation of computational intelligence technologies for shorten design cycles and predictive lethal effects. To Develop deep learning methodologies to develop whole target lethality models that run fast for weaponeer and designer use. - Continue exploring the connection of ordnance modeling and simulation and lethality tools to the broader digital engineering ecosystem. To investigate and develop ordnance sub-system (energetics, fuzes, and warheads) and integrated system concepts using modeling and simulation tools. - Continue development and maturation of a mini-Joint Simulation Environment (JSE) node to conduct analysis at mission and campaign level for evaluation of munition research. To optimize S&T investments to meet warfighter needs. - Continue development and integration of maritime lethality analysis and assessment tools for air-delivered weapons delivered by the warfighter in three counter maritime scenarios. To optimize S&T investments to meet warfighter needs. FY 2025 to FY 2026 Increase/Decrease Statement:					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602602F / Conventional Munitions	Project (Number/Name) 622502 / Ordnance Technology		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
FY 2026 decreased compared to FY 2025 by \$2.083 million due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency.				
Accomplishments/Planned Programs Subtotals		57.672	65.763	61.930
		FY 2024	FY 2025	
Congressional Add: Convergence technology research		9.892	0.000	
FY 2024 Accomplishments: Conducted Congressionally directed efforts.				
FY 2025 Plans: Not applicable				
Congressional Adds Subtotals		9.892	0.000	
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
Not Applicable.				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force **Date:** June 2025

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research</i>					R-1 Program Element (Number/Name) PE 0602605F / <i>Directed Energy Technology</i>							

COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
Total Program Element	0.000	111.169	98.012	92.331	0.000	92.331	-	-	-	-	-	-
624866: <i>Lasers & Imaging Technology</i>	0.000	14.745	7.115	0.000	0.000	0.000	-	-	-	-	-	-
624867: <i>Advanced Weapons & Survivability Technology</i>	0.000	74.787	42.065	43.436	0.000	43.436	-	-	-	-	-	-
625173: <i>Laser Technology</i>	0.000	21.637	48.832	48.895	0.000	48.895	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

The Air Force Research Laboratory (AFRL) is focused on high-impact, multi-domain science & technology (S&T) solutions that drive innovation now while laying the groundwork for the Air and Space Force to win the future fight. AFRL effectively synchronizes the Department of the Air Force (DAF) S&T enterprise and workforce to align towards the most consequential DAF priorities and accelerate the delivery of game-changing S&T.

This program conducts research, development, test and evaluation in advanced high energy laser (HEL) and high power electromagnetic (HPEM) technologies to satisfy Department of the Air Force requirements in areas including counter-adversary unmanned aerial systems (c-UAS), counter-adversary intelligence/surveillance/reconnaissance (c-ISR), counter-adversary missiles (c-Missile), and counter-adversary electronics (c-Electronic). This program also conducts research and development in directed energy for lethal and non-lethal applications by assessing the vulnerability and lethality of high energy lasers and high power microwave systems to meet Air Force needs. Technologies developed under this PE 0602605 (Directed Energy Technology) feed directly into directed energy technology demonstrations to graduate the technology to a higher technology readiness level (TRL) under program 0603605F (Advanced Weapons Technology), project 633151 (High Power Solid State Laser Technology) and project 633152 (High Power Microwave Development and Integration).

This program includes funding for the requisite DAF Science & Engineering (S&E) and mission enabling civilian workforce with the necessary technical competencies to develop, manage, and deliver science & technology capabilities. The use of program funds in this program element is in conjunction with the civilian pay expenses budgeted in the following program elements: 0601102F, 0602020F, 0602102F, 0602202F, 0602203F, 0602204F, 0602298F, 0602336F, 0602602F, 0602788F, and 0603680F. In FY 2026, 54.717 million is budgeted in this program for 291 direct Full-Time Equivalent (FTE) civilians. The Air Force Research Laboratory (AFRL) utilizes 10 USC 4091, "Authorities for certain positions at science and technology reinvention laboratories" to manage the workforce strength, structure, positions, and compensation without regard to any limitation on appointments, positions, or funding in a manner consistent with the budget.

This program element does include necessary expenses to support the operation and maintenance of facilities to manage, execute, and deliver science and technology capabilities.

Funds in this PE may be used to investigate specified technology advancements in air, space and/or cyber domains.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force				Date: June 2025	
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research		R-1 Program Element (Number/Name) PE 0602605F I Directed Energy Technology			
This program is in Budget Activity 2, Applied Research because this budget activity includes studies, investigations, and non-system specific technology efforts directed toward general military needs with a view toward developing and evaluating the feasibility and practicality of proposed solutions and determining their parameters.					
B. Program Change Summary (\$ in Millions)	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Previous President's Budget	129.961	114.962	98.603	0.000	98.603
Current President's Budget	111.169	98.012	92.331	0.000	92.331
Total Adjustments	-18.792	-16.950	-6.272	0.000	-6.272
• Congressional General Reductions	-11.509	0.000			
• Congressional Directed Reductions	0.000	-16.950			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-0.004	0.000			
• SBIR/STTR Transfer	-2.081	0.000			
• Other Adjustments	-5.198	0.000	-6.272	0.000	-6.272
Change Summary Explanation					
FY 2024 decreased of \$11.509 million due to "excess to need."					
FY 2025 decreased of \$16.950 million due to "unjustified growth."					
FY 2026 decreased compared to FY 2025 by \$5.681 million due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency.					
Efficiency - Workforce Optimization					
The FY 2026 request was reduced by \$5.699 million for reduced civilian personnel full-time equivalents and funding to optimize the workforce in compliance with Executive Order 14210, "Implementing the President's Department of Government Efficiency Workforce Optimization Initiative."					
Efficiency - Contract Services					
The FY 2026 request was reduced by \$0.164 million for reduced contracts for Advisory and Assistance Services to promote efficiencies and advance the policies of the Administration in alignment with Executive Order 14222, "Implementing the President's Department of Government Efficiency Cost Efficiency Initiative."					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602605F / Directed Energy Technology				Project (Number/Name) 624866 / Lasers & Imaging Technology			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
624866: Lasers & Imaging Technology	0.000	14.745	7.115	0.000	0.000	0.000	-	-	-	-	-	-
Note This BPAC is being transferred to PE1206601SF in FY 2026 due to technology alignment.												
A. Mission Description and Budget Item Justification This project explores the technical feasibility of high power lasers, including beam control, for applications such as aircraft protection, force protection, and precision engagement from the Department of the Air Force platforms. This project investigates the effects of laser weapons on a wide range of systems and components as well as producing, modifying, validating and applying Directed Energy and non-Directed Energy concept development and assessment tools to determine which technology solutions to pursue.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2024	FY 2025	FY 2026	
Title: High Energy Laser Technologies and Directed Energy Assessments									14.745	7.115	0.000	
Description: This effort explores the technical feasibility of moderate to high power lasers, including beam control, for applications such as aircraft protection, force protection, and precision engagement from the Department of the Air Force platforms. This project investigates the effects of laser weapons on a wide range of systems and components as well as producing, modifying, validating and applying Directed Energy and non-Directed Energy concept development and assessment tools to determine which technology solutions to pursue.												
FY 2025 Plans: - Complete the assessment and development of sources for beacon/tracking illuminator lasers and associated tracking and pointing improvements. - Complete plan to develop 100-Watt average power for beacon illuminating laser used for target acquisition. - Complete the development of fiber optic amplifiers that are more resistant to nonlinear effects to demonstrate 100-Watt average power for beacon illuminating laser used for target acquisition.												
This BPAC is being transferred to PE1206601SF in FY 2026 due to technology alignment.												
FY 2026 Plans: This project is zeroed out in the future years and there are no planned efforts.												
FY 2025 to FY 2026 Increase/Decrease Statement:												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2				R-1 Program Element (Number/Name) PE 0602605F / Directed Energy Technology				Project (Number/Name) 624866 / Lasers & Imaging Technology				
B. Accomplishments/Planned Programs (\$ in Millions)										FY 2024	FY 2025	FY 2026
FY 2026 decreased compared to FY 2025 by \$7.115 million due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency.												
Accomplishments/Planned Programs Subtotals										14.745	7.115	0.000
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost	
• RDTE 02 0602605F: Directed Energy Technology	-	0.000	-	-	-	-	-	-	-	-	-	
Remarks												
D. Acquisition Strategy												
N/A												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602605F / Directed Energy Technology				Project (Number/Name) 624867 / Advanced Weapons & Survivability Technology			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
624867: Advanced Weapons & Survivability Technology	0.000	74.787	42.065	43.436	0.000	43.436	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This project conducts research in high power electromagnetics (HPEM), which can include high power microwaves (HPM), plasmas, particle beams, and millimeter waves and other unconventional, innovative weapon technologies, to satisfy Department of the Air Force requirements in the following areas: counter-adversary unmanned aerial systems (c-UAS), counter-adversary intelligence/surveillance/reconnaissance (c-ISR), counter-adversary missiles (c-Missile) and counter-adversary electronics (c-Electronic) for high-value airborne asset (HVAA) protection, and point defense. This project conducts research to advance the state-of-the-art of HPM sources, antennas, and novel directed energy applications by investigating the effects of HPM weapons on a wide range of systems and components. This project conducts physics-level numerical simulations, modeling, and analysis to inform science and technology investments and for assessing the military utility of HPM systems. This project includes but is not limited to high power microwaves, plasmas, particle beams, and millimeter waves. Technologies developed under this project feed directly into HPM technology demonstrations to graduate the technology to higher technology readiness level (TRL) under PE 0603605F (Advanced Weapons Technology), project 633152 (High Power Microwave Development and Integration).

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

	FY 2024	FY 2025	FY 2026
Title: High Power Microwave and Unconventional Weapon Technologies	35.402	16.826	17.374
Description: Investigate high power microwave and other unconventional weapon concepts using innovative technologies. Investigate non-kinetic/non-lethal counter-electronics applications technologies that support force protection tactical applications.			
FY 2025 Plans: - Continue the assessment of solid-state devices for pulse power systems to increase reliability and lifetime for aircraft protection and point defense applications. - Continue limited in-house government exploration of new and novel antenna designs for aircraft protection and point defense applications. The antenna is the largest volume sub-component of high power microwave (HPM) technologies. A new antenna design will reduce size, weight, and infrastructure while maintaining directed energy performance. These attributes will increase the technology mobility and transportability, increase the number of candidate platforms for potential integration, and extend the number of military applications for HPM technology. - Continue developing and upgrading the modeling, simulation, and analysis tools that are being utilized by the broader modeling, simulation, and analysis community for wargames, directed energy component design, mission level modeling, and military utility assessments. This work ensures that all mission partners are utilizing up-to-date computer models to create predictions for considering and utilizing directed energy technology in the future battle space. - Pause the development of smaller, higher power microwave source technology. The HPM source is a component that creates the initial high power electromagnetic wave which is amplified and emitted from the HPM device. Pausing this development delays			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602605F / <i>Directed Energy Technology</i>		Project (Number/Name) 624867 / <i>Advanced Weapons & Survivability Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
progress to conform the technology to relevant future platform size and weight restrictions and delays the 2030 next-generation DAF HPM technology demonstration for aircraft protection and point defense applications. - Pause the testing of high-power microwave components for ground and aerial high power microwave demonstrators, pause testing components in relevant environments to ensure their functionality, and pause work towards reduced logistic requirements to ease maintenance of the systems. Insufficient resourcing significantly increases the technology schedule risk to meet 2027 c-UAS and c-missile objectives to supply rapid, near-infinite munition capability for point defense applications. - Reduce research effort to build microwave sources to address high priority, real-world events and pause the design of microwave sources that would increase the target set of high-power microwave systems. - Pause proactive research of arctic climate microwave propagation, material-interaction effects, and technology employment, to support future military applications in austere environments. This effort decreases the risk to utilizing high power microwave directed energy technology for operational suitability in all environments relevant to military applications. FY 2026 Plans: - Initiate in-house government evaluation of mission sets for particle beam technologies. This evaluation will compare recent advances in particle beam component technology maturation against updates to strategic defense priorities to identify potential asymmetric advantages to benefit military application. - Continue advancing, supporting, and transitioning directed energy weapon modeling, simulation, and analysis tools, including more realistic weather effects on directed energy, updated laser vulnerability modules, and updated high power microwave (HPM) vulnerability modules to the defense wargaming communities. This work ensures that mission partners are utilizing up-to-date computer models to create predictions for considering and utilizing directed energy technology in the future battle space. - Continue the development of solid-state devices for HPM pulse power systems. This work seeks to increase reliability, increase pulse repetition rates, and improve lifetime for aircraft protection and point defense applications. - Continue in-house government exploration of new and novel antenna designs to reduce size, weight, and infrastructure while maintaining performance for use in point defense applications. The antenna is the largest volume sub-component of HPM technologies. A new antenna design will reduce size, weight, and infrastructure while maintaining directed energy performance. These attributes will increase the technology mobility and transportability, increase the number of candidate platforms for potential integration, and extend the number of military applications for HPM technology. - Pause effort to develop high power microwave (HPM) sources to address high priority, real-world events. A HPM source is a component that creates the initial high power electromagnetic wave which is amplified and emitted from the HPM device. This effort includes optimizing source designs to expand the threats susceptible to high power microwave systems, conforms the technology to relevant future platform size and weight restrictions, and prepares the technology for the 2030 next-generation DAF HPM technology demonstration for aircraft protection and point defense applications.					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602605F / <i>Directed Energy Technology</i>	Project (Number/Name) 624867 / <i>Advanced Weapons & Survivability Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Pause proactive research of arctic climate microwave propagation, material-interaction effects, and technology employment, to support future military applications in austere environments. This effort decreases the risk to utilizing high power microwave directed energy technology for operational suitability in all environments relevant to military applications.” FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$0.548 million for High Power Microwave and Unconventional Weapon Technologies, allowing the restart of the previously paused in-house government evaluation of mission sets for particle beam technologies.			
Title: High Power Microwave Effects Description: Assess the effects/lethality of high-power microwave technologies. Develop and apply sophisticated models to enhance the development of high-power microwave and related technology. Develop tools and perform assessments which allow comparisons among directed energy concepts and trade-offs between directed energy and non-directed energy solutions. FY 2025 Plans: - Continue in-house government development of high power microwave (HPM) source modeling and simulation tools to decrease the time and processing power required for each computer simulation. - Pause effort to populate the database of high power microwave sources to include solid-state sources; focus on new frequencies and waveforms to increase potential target list susceptible to high power microwaves. - Terminate the military utility assessments of high-power microwave weapon technology integrated into the kill-chain for multiple target engagements using end-to-end mission level modeling. - Terminate assessing synergistic weapon concepts that merge kinetic energy and non-kinetic high power microwave weapon capabilities into one weapon system; perform engagement and mission level modeling to determine military utility. - Continue developing and upgrading the modeling, simulation, and analysis tools that have been transitioned to the broader modeling, simulation, and analysis community; collaborating at the enterprise-level and international-level system analysis. FY 2026 Plans: - Restart the previously paused effort to populate the database of high-power sources to include solid-state sources. Specific test activity includes identifying new targets susceptible to defeat by new high power microwave waveforms and frequencies. - Continue in-house government development to decrease the time required for high fidelity simulations while also reducing the computational processing power required. - Continue advancing, supporting, and transitioning directed energy weapon, modeling, simulation, and analysis for point defense and high-value airborne asset (HVAA) protection tools for the broader modeling, simulation, and analysis wargaming communities, and collaboration with enterprise-level and international-level system analysis. FY 2025 to FY 2026 Increase/Decrease Statement:		39.385	25.239
			26.062

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602605F / Directed Energy Technology	Project (Number/Name) 624867 / Advanced Weapons & Survivability Technology		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
FY 2026 increased compared to FY 2025 by \$0.823 million, for High Power Microwave Effects allowing the restart of the previously paused effort to populate the database of high power sources, which includes solid-state sources.				
Accomplishments/Planned Programs Subtotals		74.787	42.065	43.436
C. Other Program Funding Summary (\$ in Millions) N/A				
Remarks				
D. Acquisition Strategy Not Applicable				

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force Date: June 2025

Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602605F / Directed Energy Technology				Project (Number/Name) 625173 / Laser Technology			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
625173: Laser Technology	0.000	21.637	48.832	48.895	0.000	48.895	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This project conducts research to advance the state-of-the-art in continuous wave (CW) and pulsed laser sources, optical beam combination techniques, optical beam control technologies, optical beam propagation methodologies, lethality enhancement techniques via laser effect testing, and the integration of these technologies into laboratory-level system demonstration packages for Air Force applications such as counter-adversary unmanned aerial systems (c-UAS), counter-adversary intelligence/surveillance/reconnaissance (c-ISR), and counter-adversary missiles (c-Missile) for high value airborne asset (HVAA) protection, and point defense. This project conducts modeling, simulation, and analysis to guide science and technology investments and for assessing the military utility of the technologies being developed. Technologies developed under this project feed directly into laser system technology demonstrations to graduate the technology to a higher technology readiness level (TRL) under PE 0603605F (Advanced Weapons Technology), 633151 (High Power Solid State Laser Technology).

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

	FY 2024	FY 2025	FY 2026
Title: Laser Technology Description: High energy laser (HEL) research and development (R&D) includes advancements in continuous wave (CW) and pulsed laser sources, optical beam combination techniques, optical beam control technologies, optical beam propagation methodologies, and the integration of these technologies into laser weapon system demonstration packages. To direct laser technology development, this project investigates the lethality of high energy laser weapons against target materials and systems of interest and develops/employs target engagement analysis tools to determine effective and efficient uses of laser weapon system technologies to satisfy Department of the Air Force requirements, including counter-adversary unmanned aerial systems (c-UAS), counter-adversary intelligence/surveillance/reconnaissance (c-ISR), and counter-adversary missiles (c-Missile) for High Value Airborne Asset (HVAA) protection and point defense. FY 2025 Plans: - Continue, at a reduced rate, in-house development, validation, and transition of predictive, multi-physics modeling tools required to optimize laser weapon system concept designs. Activities within this fiscal year include preparing validated models to enable technology demonstration which is expected to kick off in FY 2027 (PE 0603605F/633151). - Continue, until mid-year pause, development of laser subsystem technologies to advance the state of the art of continuous wave and pulsed laser sources, optical beam combination techniques, optical beam control technologies, and laser beam propagation/compensation techniques. Activities this FY include preparing technologies for transition into planned laser technology demonstrator system development expected to kick off in FY 2027 (PE 0603605F/633151). Laser subsystem development will resume, behind schedule, in FY 2026. - Continue, at a reduced rate, developing laser vulnerability models for high-priority emerging threat systems. Activities within this FY include preparing critical threat-vulnerability data packages and laser effects data packages to inform the Department of Defense and the laser system technology demonstrator development expected to kick off in FY 2027 (PE 0603605F/633151).	21.637	48.832	48.895

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602605F / <i>Directed Energy Technology</i>		Project (Number/Name) 625173 / <i>Laser Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
- Continue, at a reduced rate, efforts to transition state-of-the-art modeling and simulation tools necessary to design and build laser systems to the Department of Defense and industry modeling, simulation, and analysis community. Ongoing activities within this FY include finalizing current model versions and transitioning them to the Department of Defense and industrial partners. - Continue, at reduced rate, participation in Department of Defense-wide tabletop exercises and wargames via development and implementation of laser weapon system engagement concepts. Ongoing activities within this FY include wargame participation and generating critical laser weapon system employment data from wargame results, required to design, develop, and demonstrate effective laser weapon system capabilities. - Conclude investigation of alternative high-power fiber amplifier designs with significantly reduced size-weight-and-power consumption suitable for directed energy systems. Activities within this FY include finalizing associated design concepts and documentation for transition to government and industrial partners. In FY 2025, PE 0602605F, Directed Energy Technology, Project 624867, Advanced Weapon & Survivability Technology partial efforts were transferred to PE 0602605F, Directed Energy Technology Project 625173, Laser Technology, in order to align funding and work. FY 2026 Plans: - Continue in-house development, validation, and transition of predictive, multi-physics modeling tools required to optimize laser weapon system concept designs. Activities within this fiscal year (FY) include preparing validated models to enable technology demonstration which is expected to kick off in FY 2027 (PE 0603605F/633151). - Continue development of laser subsystem technologies to advance the state of the art of continuous wave and pulsed laser sources, optical beam combination techniques, optical beam control technologies, and laser beam propagation/compensation techniques. Activities within this FY include preparing technologies for transition into planned laser technology demonstrator system development expected to kick off in FY 2027 (PE 0603605F/633151). - Continue in-house development of laser vulnerability models and laser effects assessments for high-priority emerging threat systems. Activities within this FY include preparing critical threat-vulnerability data packages and laser effects data packages to inform laser system technology demonstrator development expected to kick off in FY 2027 (PE 0603605F/633151). - Continue efforts to transition high-fidelity, multi-physics, laser and beam-propagation modeling and simulation capabilities that accurately predicts complex system performance, enabling partners to effectively design and validate laser system performance before hardware build phase. Ongoing activities within this FY include finalizing current model versions and transitioning them to the Department of Defense and industrial partners. - Continue participation in Department of Defense-wide tabletop exercises and wargames via development, and implementation of laser weapon system engagement concepts. Ongoing activities within this FY include wargame participation and generating critical laser weapon system employment data, from wargame results required to design, develop, and demonstrate effective laser weapon system capabilities.					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602605F / <i>Directed Energy Technology</i>	Project (Number/Name) 625173 / <i>Laser Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Initiate development and implementation of in-house model-based systems engineering (MBSE) and digital engineering constructs. Activities within this FY include developing systems engineering models and workflows to inform planned laser weapon system demonstrator development expected to kick off in FY 2027 (PE 0603605F/633151) and to direct in-house technology development that will feed these demonstrations. <i>FY 2025 to FY 2026 Increase/Decrease Statement:</i> Not applicable.			
Accomplishments/Planned Programs Subtotals		21.637	48.832
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
Non Applicable			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force	Date: June 2025

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research</i>	R-1 Program Element (Number/Name) PE 0602788F <i>I Dominant Information Sciences and Methods</i>

COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
Total Program Element	0.000	337.052	207.333	187.036	0.000	187.036	-	-	-	-	-	-
625315: <i>C4I Dominance Technology</i>	0.000	226.318	87.270	115.649	0.000	115.649	-	-	-	-	-	-
625319: <i>Cyberspace Dominance Technology</i>	0.000	83.422	93.674	42.563	0.000	42.563	-	-	-	-	-	-
62OMMS: <i>Research Site Support</i>	0.000	27.312	26.389	28.824	0.000	28.824	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

The Air Force Research Laboratory (AFRL) is focused on high-impact, multi-domain science & technology (S&T) solutions that drive innovation now, while laying the groundwork for the Air and Space Force to win the future fight. AFRL effectively synchronizes the Department of the Air Force (DAF) S&T enterprise and workforce to align towards the most consequential DAF priorities and accelerate the delivery of game-changing S&T.

This program executes applied research to develop information technologies for the Department of the Air Force to address technology gaps for Command, Control, Communications, Computers, Cyber, Intelligence, Surveillance, Reconnaissance, and Targeting (C5ISR). These technologies are required to advance the state-of-the-art for C5ISR that encompasses integrated systems and processes used by the Department of the Air Force and its joint & coalition partners, to collect, process, analyze, and disseminate information to achieve decision-making superiority for warfighter operations.

The C4I Dominance Technology Project provides the technologies for (a) informed decision making and coordinated operations; (b) reliable, resilient, and secure communications; (c) advanced computer processing and data & information analysis. C4I is defined as Command, Control, Communications, Computers, and Intelligence.

The Cyberspace Dominance Technology Project provides the technologies to achieve and maintain superiority in cyberspace (aligning with air, land, sea, and space domains), focusing on cyber offense, cyber defense, and cyber resilience.

The Research Site Support Project provides the Rome Research Site infrastructure at Rome, New York and provides for the continued operations of all Rome Research Site properties, buildings, and services necessary for the research mission for AFRL and for the Defense Finance and Accounting Service (DFAS) Rome, NY location.

Efforts in this program have been coordinated through the Department of Defense (DoD) Science and Technology (S&T) Executive Committee process to harmonize efforts and eliminate duplication.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force				Date: June 2025		
Appropriation/Budget Activity		R-1 Program Element (Number/Name)				
3600: Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research		PE 0602788F I Dominant Information Sciences and Methods				
This program includes funding for the requisite DAF Science & Engineering (S&E) and mission enabling civilian workforce with the necessary technical competencies to develop, manage, and deliver science & technology capabilities. The use of program funds in this program element is in conjunction with the civilian pay expenses budgeted in the following program elements: 1206601SF, 0601102F, 0602020F, 0602102F, 0602202F, 0602203F, 0602204F, 0602298F, 0602336F, 0602602F, 0602605F, and 0603680F. In FY 2026, \$104.926 million is budgeted in this program for 627 direct Full-Time Equivalent (FTE) civilians. The Air Force Research Laboratory (AFRL) utilizes 10 USC 4091, "Authorities for certain positions at science and technology reinvention laboratories" to manage the workforce strength, structure, positions, and compensation.						
This program is in Budget Activity 2, Applied Research because this budget activity includes studies, investigations, and non-system specific technology efforts directed toward general military needs with a view toward developing and evaluating the feasibility and practicality of proposed solutions and determining their parameters.						
B. Program Change Summary (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Previous President's Budget		182.076	176.333	176.607	0.000	176.607
Current President's Budget		337.052	207.333	187.036	0.000	187.036
Total Adjustments		154.976	31.000	10.429	0.000	10.429
• Congressional General Reductions		-0.997	0.000			
• Congressional Directed Reductions		0.000	0.000			
• Congressional Rescissions		0.000	0.000			
• Congressional Adds		170.500	31.000			
• Congressional Directed Transfers		0.000	0.000			
• Reprogrammings		0.000	0.000			
• SBIR/STTR Transfer		-7.244	0.000			
• Other Adjustments		-7.283	0.000	10.429	0.000	10.429
Congressional Add Details (\$ in Millions, and Includes General Reductions)						
Project: 625315: C4I Dominance Technology						
Congressional Add: Program Increase - Photonic Chips for Quantum Computing						9.7950.000
Congressional Add: Program Increase - Heterogeneously Integrated Photonics and Electronic Technologies						9.7950.000
Congressional Add: Program Increase - Quantum Entanglement Distribution						9.7950.000
Congressional Add: Program Increase - Technology Innovation Collaborative						1.9590.000
Congressional Add: Program Increase - Secure Quantum Computing Facility						18.6130.000
Congressional Add: Program Increase - Future Flag JADC2 Operational Experimentation Testbed						24.4870.000
Congressional Add: Program Increase - Quantum Cryptography						9.7950.000
Congressional Add: Program Increase - Ion Trap Quantum Computing						14.6920.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 2: Applied Research</i>		R-1 Program Element (Number/Name) PE 0602788F <i>I Dominant Information Sciences and Methods</i>	
<u>Congressional Add Details (\$ in Millions, and Includes General Reductions)</u>		FY 2024	FY 2025
Congressional Add: <i>Program Increase - Internet of Things Living Ecosystem</i>		2.448	0.000
Congressional Add: <i>Program Increase - Multi-domain RF Spectrum Environment</i>		9.795	0.000
Congressional Add: <i>Program Increase - Photonic Quantum Computing</i>		3.918	0.000
Congressional Add: <i>Program Increase - Quantum Network Testbed</i>		9.795	0.000
Congressional Add: <i>Program Increase - University-based Quantum Materials Applied Research</i>		19.590	0.000
Congressional Add Subtotals for Project: 625315		144.477	0.000
Project: 625319: <i>Cyberspace Dominance Technology</i>			
Congressional Add: <i>Program Increase - Cyberspace Dominance Technology</i>		9.795	0.000
Congressional Add: <i>Program Increase - C-UAS High Speed Imaging Technology</i>		1.959	0.000
Congressional Add: <i>Program Increase - UAS Traffic Management Advanced Air Mobility Enhancements</i>		9.795	0.000
Congressional Add: <i>Program increase - dependable AI for national security</i>		0.000	11.000
Congressional Add: <i>Program increase - TPS75 radar CUAS upgrade</i>		0.000	12.000
Congressional Add: <i>Program increase - Air domain awareness for airspace safety, management and counter UAS effectiveness</i>		0.000	8.000
Congressional Add Subtotals for Project: 625319		21.549	31.000
Congressional Add Totals for all Projects		166.026	31.000
<u>Change Summary Explanation</u>			
In FY 2024, decrease of \$7.283 million in Other Adjustments was due to realignment of funds to PE 0602212F, Defense Laboratories R&D Projects, to implement the Department of Defense (DoD) Funding Laboratory Enhancements Across Four Categories (FLEX-4) authority under 10 U.S.C Section 4123.			
The FY 2026 budget request increased by a net \$10.429 million due to programmatic adjustments within the Science and Technology portfolio. The net increase is primarily due to a correction in the average annual civilian pay cost. Additional programmatic changes include:			
-- The FY 2026 request was reduced by \$10.512 million for civilian personnel to optimize the workforce in compliance with Executive Order 14210, "Implementing the President's Department of Government Efficiency Workforce Optimization Initiative." -- The FY 2026 request was reduced by \$0.067 million for Advisory and Assistance Services to promote efficiencies and advance the policies of the Administration in alignment with Executive Order 14222, "Implementing the President's Department of Government Efficiency Cost Efficiency Initiative." -- The FY 2026 request was reduced by \$3.968 million for programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency.			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025																										
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602788F / Dominant Information Sciences and Methods				Project (Number/Name) 625315 / C4I Dominance Technology																											
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost																								
625315: C4I Dominance Technology	0.000	226.318	87.270	115.649	0.000	115.649	-	-	-	-	-	-																								
Note Within Project 625315, C4I Dominance Technology, the following changes took place: In FY 2026, the Multi-Domain Command & Control (MDC2) effort will be renamed to the Combined Joint All-Domain Command & Control (CJADC2) effort to more accurately capture its focus on enhancing support for joint operations. In FY 2026, the work and funding associated with the "Data to Decisions" effort and the "Processing Technologies" effort will be consolidated into the "Multi-Domain Sensemaking" effort, to best communicate the accelerated research and development of technologies for data processing, fusion, exploitation, and analysis. A. Mission Description and Budget Item Justification This project executes mission-driven applied research to advance the critical technologies supporting Command, Control, Communications, Computers, and Intelligence (C4I), a core enabler of operational effectiveness across the Department of the Air Force (DAF). Activities under this project accelerate the development of next-generation capabilities to ensure time-dominant decision-making, enable synchronized multi-domain operations, and provide reliable, cyber-secure communications in contested environments. Additionally, these efforts advance high-speed computing and data analytics to support real-time intelligence processing and information fusion, which are essential to operational readiness and the successful implementation of Combined Joint All-Domain Command and Control (CJADC2). B. Accomplishments/Planned Programs (\$ in Millions) <table><tr><td></td><td>FY 2024</td><td>FY 2025</td><td>FY 2026</td></tr><tr><td>Title: Combined Joint All-Domain Command & Control (CJADC2)</td><td>17.538</td><td>23.011</td><td>30.727</td></tr><tr><td colspan="4">Description: In FY 2026, the Multi-Domain Command & Control (MDC2) effort will be renamed to the Combined Joint All-Domain Command & Control (CJADC2) effort to more accurately capture its focus on enhancing support for joint operations.</td></tr><tr><td colspan="4">Research and develop foundational technologies for complex adaptive systems, complex effects analysis, artificial intelligence (AI), autonomy, and machine learning (ML) to provide advanced capabilities in command and control (C2) and decision support for contested environments across all domains (air, land, maritime, space, cyber). This research will focus on distributed C2 systems & applications for Air Force operations at speed and scale, provide multi-domain effects quantification, planning, execution, & assessment, and apply AI, autonomy, & ML for the next generation of CJADC2 applications.</td></tr><tr><td colspan="4">FY 2025 Plans:</td></tr><tr><td colspan="4">- Continue research and development to manage the complexity of distributed command and control (C2) resources and assess the ability to perform task redistribution in a highly-resource constrained environment.</td></tr></table>														FY 2024	FY 2025	FY 2026	Title: Combined Joint All-Domain Command & Control (CJADC2)	17.538	23.011	30.727	Description: In FY 2026, the Multi-Domain Command & Control (MDC2) effort will be renamed to the Combined Joint All-Domain Command & Control (CJADC2) effort to more accurately capture its focus on enhancing support for joint operations.				Research and develop foundational technologies for complex adaptive systems, complex effects analysis, artificial intelligence (AI), autonomy, and machine learning (ML) to provide advanced capabilities in command and control (C2) and decision support for contested environments across all domains (air, land, maritime, space, cyber). This research will focus on distributed C2 systems & applications for Air Force operations at speed and scale, provide multi-domain effects quantification, planning, execution, & assessment, and apply AI, autonomy, & ML for the next generation of CJADC2 applications.				FY 2025 Plans:				- Continue research and development to manage the complexity of distributed command and control (C2) resources and assess the ability to perform task redistribution in a highly-resource constrained environment.			
	FY 2024	FY 2025	FY 2026																																	
Title: Combined Joint All-Domain Command & Control (CJADC2)	17.538	23.011	30.727																																	
Description: In FY 2026, the Multi-Domain Command & Control (MDC2) effort will be renamed to the Combined Joint All-Domain Command & Control (CJADC2) effort to more accurately capture its focus on enhancing support for joint operations.																																				
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FY 2025 Plans:																																				
- Continue research and development to manage the complexity of distributed command and control (C2) resources and assess the ability to perform task redistribution in a highly-resource constrained environment.																																				

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602788F / <i>Dominant Information Sciences and Methods</i>	Project (Number/Name) 625315 / <i>C4I Dominance Technology</i>
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024
- Continue development of standards that will be used to create an end-to-end (Australia, United Kingdom, and United States) joint machine learning ecosystem for the rapid development, sharing, and deployment of machine learning and artificial intelligence (AI) tools to enable joint AI missions for nation and coalition operational capabilities. - Continue research and development of generative AI techniques applied to AF data and problem sets through selected use cases, focusing on indicators & warnings analysis and multi-modal knowledge analysis through sensor fusion. - Continue advancing research and development machine learning approaches for supporting and performing operations in complex adversarial environments. FY 2026 Plans: - Initiate research and development of counter-Artificial Intelligence (AI) techniques via non-cyber means for DAF and DoD missions. --To enhance warfighter Counter-AI that will degrade or deny adversaries' own ability to utilize their AI & Machine Learning (ML). ---Activities include initiating the development of an end-to-end analysis engine to perform operational analytics against adversarial AI using established counter-AI techniques. - Initiate research and development for an AI predictor to enable AI adaptation for pulsed operations. ---To enhance the adaptation of AI & Autonomy for operations in contested environments against peer adversaries. - Initiate research and development for a capability to represent and display spatio-temporal logistics information and connections to varying mission objectives and perform analysis on the robustness of logistics plans. --Enhance logistics planning for DAF operations that reduce, or are resilient to, adversary attacks. - Initiate and complete research and development to identify and characterize technical gaps for pulsed operations as it relates to C4I. --Identify technological capabilities needed for command and control (C2) and battle management (BM) of pulsed operations in the Pacific theater. - Continue research and development to manage the complexity of distributed command and control (C2) resources and assess the ability to perform task redistribution in a highly-resource constrained environment. --To optimize, orchestrate, and execute workflows from across multiple locations for distributed C2. ---Activities include development, testing, and assessment of distributed C2 optimization algorithms on operationally relevant data and scenarios. - Continue development of standards that will be used to create an end-to-end (Australia, United Kingdom, and United States) joint machine learning ecosystem for the rapid development, sharing, and deployment of machine learning and artificial intelligence (AI) tools to enable joint AI missions for nation and coalition operational capabilities. --To enhance interoperability of AI assets between international partners for improved coalition operations. ---Activities include development, testing, assessment, and verification of "AI Passport" for release to partner nations and their respective users. - Complete research and development of generative AI techniques applied to AF data and problem sets through selected use cases, focusing on indicators & warnings analysis and multi-modal knowledge analysis through sensor fusion. --Increase effectiveness for DAF operations by leveraging generative AI techniques to process large amounts of data that leads to optimal decision-making and command and control (C2).		FY 2025
		FY 2026

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602788F / <i>Dominant Information Sciences and Methods</i>	Project (Number/Name) 625315 / <i>C4I Dominance Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Complete advancing research and development machine learning approaches for supporting and performing operations in complex adversarial environments. --Increase the speed to employ AI agents for operational evaluation for potential implementation. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 funding increased compared to FY 2025 by \$7.716 million due to strategic realignment of funding and resources within this Program Element from Project 625315, Cyberspace Dominance Technology, to Project 625319, C4I Dominance Technology, to optimize core research investments in Command & Control, Communications, Computers, and Intelligence (C4I) applied research and due to updated average work year costs.			
Title: Multi-Domain Sensemaking Description: In FY 2026, the work and funding associated with the "Data to Decisions" effort and the "Processing Technologies" effort within this Project will be merged into the "Multi-Domain Sensemaking" effort, to promote deeper integration of battlespace awareness and extreme computing technologies and accelerate technological development. Research and develop foundational technologies to provide the capabilities that aggregate, fuse, exploit, and analyze disparate data from all operational domains (land, sea, air, space, cyber) to facilitate the generation of a real-time understanding of the battlespace. These technologies establish the data infrastructure and processing power necessary to support advanced analytics, enabling the potential leveraging of Artificial Intelligence (AI), Autonomy, and Machine Learning (ML) for rapid identification of threats, opportunities, and emergent patterns. By providing a robust foundation for data-driven insights, these technologies ultimately contribute to enhancing situational awareness, accelerating decision cycles, and improving overall operational effectiveness in complex, multi-domain environments. FY 2025 Plans: - In FY 2025, this research is conducted in the "Data to Decisions" and "Processing Technologies" efforts. FY 2025 funding for these efforts are: \$21.875 million for the Data to Decisions effort and \$7.887 million for the Processing Technologies effort. FY 2026 Plans: - Initiate and complete research and development for querying and exploitation of knowledge graphs (KGs) with Large Language Models (LLMs). --Reduces the investigative burden on warfighter analysts, enabling faster and more accurate decision-making. - Initiate and complete research and development to develop and experiment on automatic target recognition (ATR) leveraging topologically informed neural networks (TINN). --Allows the warfighter to overcome adversarial deceptions (e.g., jamming). - Continue research and development of an automated multi-source data fusion and spatio-temporal grounding capability, seeking opportunities for future applications with existing targeting systems. --Will reduce the investigative burden of warfighter analysts		0.000	39.622

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602788F / Dominant Information Sciences and Methods	Project (Number/Name) 625315 / C4I Dominance Technology		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
through automation of the targeting research and prosecution process. ---Activities include testing and assessing developed algorithms to demonstrate increased efficiency for analysis and targeting. - Continue research and development of multi-channel emitter detection and geolocation system hardware, intercept processing software, distributed sensing and automated target detection, recognition software, and ontology development. --Enables persistent intelligence, surveillance, & reconnaissance execution on unmanned platforms in theaters of high interest where traditional manned platforms have limited ability. ---Activities include testing efficient emitter detection algorithms/models using edge computing systems. - Continue research to advance the Strategic Sensing Grid orchestration and data exploitation.--To provide a collaborative, autonomous, Sensing Grid (SG) for Situational Awareness (SA) of ground and air high value targets (HVTs). ---Activities include creating multi-target scenarios to demonstrate performance benefits of autonomous detection tracking and identification. - Continue advancing the application of novel neuromorphic systems for robust and dynamic machine learning, including on mobile or power-constrained platforms.--Enable extreme computing at the sensor to accelerate the Find, Fix, Track, & Target process for the warfighter. Activities include testing and assessing developed algorithms using operationally relevant datasets. - Complete research and development for a High-Value Target (HVT) recommendation system. --Optimizes moving target indicator (MTI) trackers to best ensure HVTs are monitored and non HVTs are disregarded. - Complete research to seek correlations between non-traditional data source signatures and multi-satellite actions. --To enhance the ability to predict multi-satellite engagement scenarios and assess threat impacts. - Complete research and development to collaborate with designated universities to produce a supercomputer in a compact container. --To enhance Artificial Intelligence/Machine Learning (AI/ML) computing at the sensor for real-time data processing for improved decision making. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 funding increased compared to FY 2025 by \$39.622 million due to the following: 1) the transfer of associated work and funding from the "Data to Decisions" effort (21.875 million) and "Processing Technologies" effort (7.887 million) to promote deeper integration of battlespace awareness and extreme computing technologies and accelerate technological development; and 2) strategic realignment (9.860 million) of funding and resources within this Program Element from Project 625315, Cyberspace Dominance Technology, to Project 625319, C4I Dominance Technology, to optimize core research investments in Command & Control, Communications, Computers, and Intelligence (C4I) applied research and due to updated average work year costs.				
Title: Assured Communications & Networks		15.458	22.920	32.61
Description: Develop communications, networking, and signal processing technologies with improved survivability and capacity to provide secure, adaptive, covert, anti-jam, and assured global battlespace connectivity tailored to anti-access and area-denial environments and contested operations. Includes the research and development to advance existing nuclear capable forces to ensure command, control, and connectivity for the President without constraints.				

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602788F / <i>Dominant Information Sciences and Methods</i>	Project (Number/Name) 625315 / <i>C4I Dominance Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
FY 2025 Plans: - Initiate research and development on control technology for modular analog antenna arrays and begin developing tracking algorithms and software interfaces for use with these arrays. - Initiate research and development of a wireless communications system operating at frequencies above 100 GHz (terahertz band) with low probability of detection and anti-jam properties, for communications in contested environments. - Initiate development on Artificial Intelligence/Machine Learning (AI/ML)-based tactical communications waveforms and an emulation environment to test the performance of developed waveforms. - Continue implementation and simulation against several adversarial interference conditions for operationally-relevant scenarios. - Complete the research and development of technologies for robust, adaptive, and mission-aware airborne networks. - Complete the research and development of large-scale hardware-in-the-loop verification of developed directional networking protocols. - Complete the research and development of propagation models. - Complete the development of a network stack suitable for high-bandwidth terahertz links. - Complete the development, verification, and validation of an advanced, airborne high-frequency antenna/ionospheric structure. - Complete the development of an airborne mesh networking capability that utilizes adaptive and responsive antennas for a dynamic and reliable high capacity mesh network suitable for communications in contested environments. - Complete the development, verification, and test of advanced waveforms. - Complete the development, verification, validation, and test of software-defined radio prototypes. - Complete the development of enhanced assurance and filtration offloading. - Complete the development of capabilities that incorporate communications network connectivity into information extraction tools. FY 2026 Plans: - Initiate and complete research to develop radio frequency (RF) communication waveforms that can sustain mission data requirements while undermining non-Blue Force applications in the same bands. --To provide the ability to mitigate adversary communication capabilities while concurrently sustaining mission effectiveness. - Continue research and development on control technology for modular analog antenna arrays. --Enable flexible warfighter communications in contested environments by providing spectrum agility. ---Activities include testing and assessing angle of arrival methods and quad serial peripheral interface (quad-SPI)). - Continue research and development of a wireless communications system operating at frequencies above 100 GHz (terahertz band). --Provides low probability of detection (LPD) and anti-jam (AJ) properties for communications in contested environments. ---Activities include testing and verifying advanced model-based design and characterization of the communications system. - Continue development of Artificial Intelligence/Machine Learning (AI/ML)-based tactical communications waveforms. --Provide the ability to overcome adversarial interference or detection by sensing the environment and assembling some unique			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602788F / <i>Dominant Information Sciences and Methods</i>	Project (Number/Name) 625315 / <i>C4I Dominance Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
waveform(s). ---Activities include developing and testing the waveform selection algorithms over-the-air within emulated environments. - Complete implementation and simulation against several adversarial interference conditions for operationally-relevant scenarios. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 funding increased compared to FY 2025 by \$9.691 million due to strategic realignment of funding and resources within this Program Element from Project 625315, Cyberspace Dominance Technology, to Project 625319, C4I Dominance Technology, to optimize core research investments in Command & Control, Communications, Computers, and Intelligence (C4I) applied research and due to updated average work year costs.			
Title: Data to Decisions Description: In FY 2026, the work and funding associated with this effort will be consolidated into the "Multi-Domain Sensemaking" effort to best communicate the accelerated research and development of technologies of data processing, fusion, exploitation, & analysis. Investigate and develop technologies for decision quality information dissemination services via publish, subscribe, and query across the Global Information Grid to enterprise and tactical assets and coalition partners. FY 2025 Plans: - Initiate research and development for a High-Value Target (HVT) recommendation system and system architecture. - Initiate research and development of an automated multi-source data fusion and spatio-temporal grounding capability, seeking opportunities for future applications with existing targeting systems. - Initiate research and development of multi-channel emitter detection and geolocation system hardware, intercept processing software, distributed sensing and automated target detection, recognition software, and ontology development. - Continue research to seek correlations between non-traditional data source signatures and multi-satellite actions. - Continue research to advance the Strategic Sensing Grid orchestration and data exploitation. - Complete the research and development of data analytics and strategic indications and warnings technologies (including large data alignment, indexing and search on textual data, large-scale and disparate data sources, both structured and unstructured data, and employment of various ontologies and machine learning techniques). - Complete the development of Conversational Artificial Intelligence (CAI) capabilities to deliver conversational agents capable of answering complex analytical questions. - Complete the development of a user customizable entity, event, and relation text extraction capability with automatic performance estimates of the user-customized extractors on new documents and mission areas. - Complete research and development of a Request for Information dialog system that can help answer RFIs for single service applications across 10 essential Intelligence enterprise identified RFIs.		14.615	21.875
			0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602788F / Dominant Information Sciences and Methods	Project (Number/Name) 625315 / C4I Dominance Technology		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Complete the development of a Multi-Source Intelligence, Surveillance, and Reconnaissance ontology connecting Air Force analytics, Application Programming Interfaces, and services. - Complete research and development of an integrated threat detection system based on vetted events from Publicly Available Information fused and corroborated with ISR sources. - Complete the research and development of autonomous, heterogeneous, distributed multi-sensor management and upstream data fusion for improved target detection, tracking, and classification. - Complete the development of new methods that exploit traditional and non-traditional data to categorize and predict engagement scenarios of coordinated, non-cooperative targets, and that assess the threats based on situation-driven adversary capabilities. - Complete the development of capabilities to automate emitter corridor extraction and mode tagging to deploy capabilities onboard the collection platform. - Complete the research of methods that allow for change detection and pattern recognition. - Complete development of a machine-learning environment to autonomously govern the execution of composite tasks. - Complete development of an analyst recognition engine for application programming interfaces, data, and services. - Complete development of an advanced multimodal threat forecasting system. FY 2026 Plans: In FY 2026, the work and funding associated with the "Data to Decisions" effort will be consolidated into the "Multi-Domain Sensemaking" effort to best communicate the accelerated research and development of technologies of data processing, fusion, exploitation, & analysis. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 funding decreased compared to FY 2025 by \$21.875 million due to the consolidation of this research into the "Multi-Domain Sensemaking" effort.				
Title: Processing Technologies Description: In FY 2026, the work and funding associated with this effort will be consolidated into the "Multi-Domain Sensemaking" effort to foster greater integration of supreme processing and computing for applied research. Develop automatic and dynamically reconfigurable, scalable, affordable distributed peta-flop processing technologies for real-time global information systems. FY 2025 Plans: - Initiate research and development to collaborate with designated universities to produce a super computer in a compact container.		6.616	7.887	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602788F / <i>Dominant Information Sciences and Methods</i>	Project (Number/Name) 625315 / <i>C4I Dominance Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Continue advancing the application of novel neuromorphic systems for robust and dynamic machine learning, including on mobile or power-constrained platforms. FY 2026 Plans: In FY 2026, the work and funding associated with the "Processing Technologies" effort will be consolidated into the "Multi-Domain Sensemaking" effort to foster greater integration of supreme processing and computing for applied research. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 funding decreased compared to FY 2025 by \$7.887 million due to the consolidation of this research into the "Multi-Domain Sensemaking" effort.			
Title: Artificial Intelligence/Autonomy/Machine Learning Description: In FY 2025, this work transferred to the "Combined Joint All-Domain Command and Control" effort. Perform research and development (R&D) to harness the speed and scale of computers and machines to address problems of complexity. FY 2025 Plans: - In FY 2025 and out, this research is continued in the "Combined Joint All-Domain Command and Control" effort. FY 2026 Plans: Not applicable FY 2025 to FY 2026 Increase/Decrease Statement: No change in funding.		13.699	0.000
Title: Quantum Information Science Description: Perform research and development (R&D) that will utilize quantum physics for the storage, transmission, manipulation, computing, or measurement of information in ways that offer advantages to classical capabilities. FY 2025 Plans: - Continue research and analysis into designs for network architecture and connectivity and advanced network node operation. - Continue research and development in the area of supreme and quantum computing information sciences. - Continue to advance development of further reducing Size, Weight, and Power (SWaP) of network node demonstrations. - Continue demonstration of quantum information processing on a single chip by using developed quantum photonics processor with photon sources. - Continue research and development of quantum photonic integrated circuits for transmission/node operations.		13.915	11.577
			12.689

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Continue research into designs for network architecture and connectivity. FY 2026 Plans: - Initiate the research towards developing a mobile ad-hoc quantum sensor network. --Provides substantial increase in sensitivity and precision leading to adaptable, high-performance sensing capabilities in contested environments. ---Activities include initial research & design of a distributed quantum sensor network for future testing and demonstration activities. - Continue research and analysis into designs for network architecture & connectivity and advanced network node operation. --To provide a ultra-secure quantum network for contested environments. ---Activities include testing the network with a background-free state detection to acquire more accurate signal measurements; manipulate trapped-ion with quantum photonic integrated circuit (QPIC) to measure and scale future network development. - Complete in-house research and development in the area of extreme computing and quantum computing information sciences. --Enhance extreme computing by increasing the speed of processing to revolutionize areas important to the Department of the Air Force including data analysis & exploitation, cryptography, and materials science; to gain a strategic advantage against peer adversaries. - Complete the research to advance development of further reducing Size, Weight, and Power (SWaP) of network node demonstrations. --Provides an increase in deployability & scalability for warfighter systems & platforms and improves cost effectiveness. - Complete the demonstration of quantum information processing on a single chip by using developed quantum photonics processor with photon sources. --Enhances stability by minimizing interference leading to more robust quantum states and provides the potential for more cost-effective quantum information science technologies for the Department of the Air Force and Department of Defense. - Complete research and development of quantum photonic integrated circuits for transmission/node operations. --Advances quantum communication and computation which is required to develop a robust quantum network and modular quantum computers. - Complete research into designs for network architecture and connectivity. --Provides the ability to develop a high-fidelity quantum network. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 funding increased compared to FY 2025 by \$1.112 million due to strategic realignment of funding and resources within this Program Element from Project 625315, Cyberspace Dominance Technology, to Project 625319, C4I Dominance Technology, to optimize core research investments in Command & Control, Communications, Computers, and Intelligence (C4I) applied research and due to updated average work year costs.			
Accomplishments/Planned Programs Subtotals		81.841	87.270
			115.649

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
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		FY 2024	FY 2025
Congressional Add: Program Increase - Photonic Chips for Quantum Computing FY 2024 Accomplishments: Conducted congressionally directed efforts. FY 2025 Plans: Not applicable		9.795	0.000
Congressional Add: Program Increase - Heterogeneously Integrated Photonics and Electronic Technologies FY 2024 Accomplishments: Conducted congressionally directed efforts. FY 2025 Plans: Not applicable		9.795	0.000
Congressional Add: Program Increase - Quantum Entanglement Distribution FY 2024 Accomplishments: Conducted congressionally directed efforts. FY 2025 Plans: Not applicable		9.795	0.000
Congressional Add: Program Increase - Technology Innovation Collaborative FY 2024 Accomplishments: Conducted congressionally directed efforts. FY 2025 Plans: Not applicable		1.959	0.000
Congressional Add: Program Increase - Secure Quantum Computing Facility FY 2024 Accomplishments: Conducted congressionally directed efforts. FY 2025 Plans: Not applicable		18.613	0.000
Congressional Add: Program Increase - Future Flag JADC2 Operational Experimentation Testbed FY 2024 Accomplishments: Conducted congressionally directed efforts. FY 2025 Plans: Not applicable		24.487	0.000
Congressional Add: Program Increase - Quantum Cryptography FY 2024 Accomplishments: Conducted congressionally directed efforts. FY 2025 Plans: Not applicable		9.795	0.000
Congressional Add: Program Increase - Ion Trap Quantum Computing		14.692	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025
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	FY 2024	FY 2025
FY 2024 Accomplishments: Conducted congressionally directed efforts.		
FY 2025 Plans: Not applicable		
Congressional Add: Program Increase - Internet of Things Living Ecosystem	2.448	0.000
FY 2024 Accomplishments: Conducted congressionally directed efforts.		
FY 2025 Plans: Not applicable		
Congressional Add: Program Increase - Multi-domain RF Spectrum Environment	9.795	0.000
FY 2024 Accomplishments: Conducted congressionally directed efforts.		
FY 2025 Plans: Not applicable		
Congressional Add: Program Increase - Photonic Quantum Computing	3.918	0.000
FY 2024 Accomplishments: Conducted congressionally directed efforts.		
FY 2025 Plans: Not applicable		
Congressional Add: Program Increase - Quantum Network Testbed	9.795	0.000
FY 2024 Accomplishments: Conducted congressionally directed efforts.		
FY 2025 Plans: Not applicable		
Congressional Add: Program Increase - University-based Quantum Materials Applied Research	19.590	0.000
FY 2024 Accomplishments: Conducted congressionally directed efforts.		
FY 2025 Plans: Not applicable		
Congressional Adds Subtotals	144.477	0.000

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

Remarks

D. Acquisition Strategy
 Not applicable

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602788F / Dominant Information Sciences and Methods				Project (Number/Name) 625319 / Cyberspace Dominance Technology			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
625319: Cyberspace Dominance Technology	0.000	83.422	93.674	42.563	0.000	42.563	-	-	-	-	-	-
A. Mission Description and Budget Item Justification												
This project will execute mission-driven applied research to develop and transition advanced technologies that secure and sustain superiority in the cyberspace domain, fully aligned with joint operations across air, land, sea, and space. The efforts under this Project will focus on three key pillars: (1) cyber offense—enabling precision effects and proactive disruption of adversarial capabilities; (2) cyber defense—ensuring robust protection of critical infrastructure, systems, and platforms against persistent and adaptive threats; and (3) cyber resilience—designing systems that can anticipate, absorb, and recover from attacks with speed and agility. By integrating these capabilities across multi-domain operations, these technologies support the Department of the Air Force's (DAF) and Department of Defense's (DoD) strategic vision for a secure, interoperable, and resilient digital ecosystem. It directly contributes to the development of agile, lethal, and networked forces capable of operating with decision advantage in highly dynamic threat environments.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2024	FY 2025	FY 2026	
Title: Cyber Defense Technologies									28.573	0.000	0.000	
Description: Starting in FY 2025, this research is continued in the "Cyber Offensive and Defensive Technologies" effort.												
Develop cyber defense and supporting technologies to detect, defend, and respond to attacks on computer systems as well as provide forensic concerning attacks.												
FY 2025 Plans:												
- In FY 2025 and out, this research is continued in the "Cyber Offensive and Defensive Technologies" effort.												
FY 2026 Plans:												
Not applicable												
FY 2025 to FY 2026 Increase/Decrease Statement:												
No change in funding.												
Title: Cyber Offensive Technologies									33.300	0.000	0.000	
Description: Develop offensive cyber operations technologies to access, maintain presence on, and deliver effects to adversary systems.												
Starting in FY 2025, this research is continued in the "Cyber Offensive and Defensive Technologies" effort.												

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
FY 2025 Plans: - In FY 2025 and out, this research is continued in the "Cyber Offensive and Defensive Technologies" effort.			
FY 2026 Plans: Not applicable			
FY 2025 to FY 2026 Increase/Decrease Statement: No change in funding.			
Title: Cyber Offensive and Defensive Technologies Description: For FY 2024 and prior years, this research was performed in the "Cyber Defense Technologies" and "Cyber Offense Technologies" efforts. Research, design, and develop cyber warfighting, assurance, and electromagnetic (EM) convergence technologies to support offensive and defensive operations across multiple domains.		0.000	62.674
FY 2025 Plans: - Initiate applied research for software assurance, vulnerability discovery, and analysis of source and executable code. - Continue development of algorithms and a physics and topologically-based model to detect critical nodes within an intra-connected and inter-connected critical infrastructure electrical power grid and communications network. - Complete research in the area of autonomous integrated cyber operations. - Complete research into mission-specific block-chain capabilities and the alignment of cyber resilient services. - Complete research and validation of a cyber-hardened (robust, secure) processor for embedded weapon systems. - Complete development of software using evolutionary approaches to make embedded systems tolerant to unexpected and unforeseen situations. - Complete research to discover concepts and capabilities for cyber survivability techniques and algorithms for counter-unmanned aerial systems. - Complete development of a counter-unmanned aerial system open architecture to enable interoperability. - Complete evolution of autonomous machine learning functions, including the validation and demonstration of automated workflows into defensive cyber operations systems. - Complete development of a model-assisted concolic firmware exploration and threat models based on device behavior. - Complete large scale device analysis and demonstration on an AF-relevant system. - Complete creation of a capability to model, intercept, and synchronize the state of all embedded devices connected on a single bus.			42.563

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602788F / <i>Dominant Information Sciences and Methods</i>		Project (Number/Name) 625319 / <i>Cyberspace Dominance Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
- Complete research and development of the design, implementation, and evaluation of a proof-of-concept model to enable secure and efficient outsourcing of relational queries and machine learning training. - Complete research and development of game changing technologies which employ dominant power for cyber offensive operations and information warfare to change the future fight. - Complete research and development in capabilities for multi-function, non-kinetic cyber effects against adversarial systems. - Complete demonstration of ground-based and airborne delivery of disrupt, deny, degrade, destroy, or deceive effects that are both cyber and physical/kinetic. - Complete the advancement of research in systems to perform blind data discovery associated with the Internet of Things. - Complete research and development for the identification of items of interest associated with the Internet of Things. - Complete research on the inference to untrusted clouds with cost-based optimization options, under Multiparty Computation (MPC) protocols with different threat models, guarantees, and physical deployments (i.e., Local Area Network, Wide Area Networks, Blockchain, or mixed) settings. - Terminate research to implement a binary injection suite on software binaries and research on expansion of software introspection techniques to exploit introspection accelerator capabilities. FY 2026 Plans: - Initiate research and development of secure, multi-platform capabilities to support joint missions across multi-domain environments through development of a high assurance containerization of multiple applications. --To provide security for containerized applications & orchestration framework that will enable mission specific, multi-platform capabilities to support joint missions across multi-domain environments. ---Activities include development and integration of security auditing tool to verify implementation correctness of cross-container and cross-pod security controls. - Continue development of algorithms and a physics and topologically-based model to detect critical nodes within an intra-connected and inter-connected electrical power grid and communications network.--To enhance the resilience of critical power grid infrastructures to ensure continued military operations.---Activities include developing algorithms that rapidly identify critical nodes within a large electrical infrastructure, test on a model representative of a large nation-wide infrastructure. - Continue applied research for software assurance, vulnerability discovery, and analysis of source and executable code. --To provide advanced software vulnerability detection capabilities, for source code and compiled binary code. ---Activities include development an experimentation of an environment to facilitate software vulnerability discovery and analysis and collaboration with established partners. - Complete the research for the feasibility and design of a digital modeling & simulation (M&S) information environment (IE) to enable rapid information operations (IO) technologies and training.--To provide a low cost, highly accessible digital Integrated Weapons Training Relevant Exercises (IWTRE) for rapid development of Information Warfare/Information Operations (IW/IO) technology and Tactics, Techniques, Procedures (TTPs), and improved readiness of operators .					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 2		R-1 Program Element (Number/Name) PE 0602788F / <i>Dominant Information Sciences and Methods</i>		Project (Number/Name) 625319 / <i>Cyberspace Dominance Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
- Complete the research to investigate novel technologies that can retrieve publicly available information from internet sources confidentially. --To provide scalable, resilient, and confidential query execution over public cloud databases. - Complete the research to investigate mission relevant terrain in cyberspace, identify gaps and develop proposed opportunities for automated or autonomous cyber operations. --To determine the optimal and most effective employment of cyber capabilities for pulsed air operations. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 funding decreased compared to FY 2025 by \$20.111 million due to strategic realignment of funding and resources within this Program Element from the Project 625315, Cyberspace Dominance Technology, to Project 625319, C4I Dominance Technology, to optimize core research investments in Command & Control, Communications, Computers, and Intelligence (C4I) applied research.					
Accomplishments/Planned Programs Subtotals			61.873	62.674	42.563
			FY 2024	FY 2025	
Congressional Add: Program Increase - Cyberspace Dominance Technology			9.795	0.000	
FY 2024 Accomplishments: Conducted congressionally directed efforts.					
FY 2025 Plans: Not applicable					
Congressional Add: Program Increase - C-UAS High Speed Imaging Technology			1.959	0.000	
FY 2024 Accomplishments: Conducted congressionally directed efforts.					
FY 2025 Plans: Not applicable					
Congressional Add: Program Increase - UAS Traffic Management Advanced Air Mobility Enhancements			9.795	0.000	
FY 2024 Accomplishments: Conducted congressionally directed efforts.					
FY 2025 Plans: Not applicable					
Congressional Add: Program increase - dependable AI for national security			0.000	11.000	
FY 2024 Accomplishments: Not applicable					
FY 2025 Plans: Conduct congressionally directed efforts.					
Congressional Add: Program increase - TPS75 radar CUAS upgrade			0.000	12.000	

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602788F / Dominant Information Sciences and Methods	Project (Number/Name) 625319 / Cyberspace Dominance Technology
	FY 2024	FY 2025
FY 2024 Accomplishments: Not applicable		
FY 2025 Plans: Conduct congressionally directed efforts.		
Congressional Add: Program increase - Air domain awareness for airspace safety, management and counter UAS effectiveness	0.000	8.000
FY 2024 Accomplishments: Not applicable		
FY 2025 Plans: Conduct congressionally directed efforts.		
Congressional Adds Subtotals	21.549	31.000
C. Other Program Funding Summary (\$ in Millions)		
N/A		
Remarks		
D. Acquisition Strategy		
Not applicable		

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602788F / Dominant Information Sciences and Methods				Project (Number/Name) 62OMMS / Research Site Support			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
62OMMS: Research Site Support	0.000	27.312	26.389	28.824	0.000	28.824	-	-	-	-	-	-
A. Mission Description and Budget Item Justification												
The Research Site Support Project ensures the continued operation, maintenance, and modernization of the Rome Research Site infrastructure in Rome, New York. This site is a strategic asset supporting both the Air Force Research Laboratory (AFRL) and the Defense Finance and Accounting Service (DFAS), enabling uninterrupted research, innovation, and financial operations essential to national defense. The project provides comprehensive support for all Rome Research Site properties, buildings, utilities, and services—ensuring a secure, resilient, and fully functional environment for day-to-day mission execution and long-term strategic objectives.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2024	FY 2025	FY 2026	
Title: Rome Research Infrastructure									27.312	26.389	28.824	
Description: Provides the necessary services and support including, but not limited to: fire inspections, refuse collection, water, electricity, steam, heat, custodial, and grounds maintenance services to the Research Site. Provides the necessary support for the maintenance and repair of Research Site facilities (buildings and other structures), vehicle & equipment lease and security/safety inspections & services as necessary for compliance and safety/security of personnel & research assets. Provides the Research Site with long haul communications (using the Government Services Administration set of Networx contracts for Continental United States), trunk connectivity and wireless communications.												
FY 2025 Plans:												
- Continue providing civilian payroll and non-pay costs for installation operations in support of the Rome Research Site property and all onsite personnel.												
- Continue providing facilities, facility operations, facility sustainment, support equipment, contracts, and associated costs to plan, manage and execute the following functions: fire prevention, disaster preparedness, plant operation and purchase of commodity, refuse collection, pavement clearance of snow and ice, grounds maintenance including landscaping, real property special inspections, pest control, and custodial services.												
- Continue providing Real Property Management and Engineering Services, including: (1) Facility Management and Administration and (2) Installation Engineering Services. Facility Management includes public works management costs, contract management, material procurement, facility data management, furnishings management costs, and real estate management. Installation Engineering Services includes annual inspection of facilities, master planning, overhead of planning and design, overhead of construction management, and non Site Recovery Management service calls.												
- Continue providing basic installation communication services, including long haul trunk and telecommunications services.												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 2	R-1 Program Element (Number/Name) PE 0602788F / <i>Dominant Information Sciences and Methods</i>	Project (Number/Name) 62OMMS / <i>Research Site Support</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Continue providing site vehicle lease for logistics, security, and mission support under the Government Services Administration. FY 2026 Plans: - Continue providing civilian payroll and non-pay costs for installation operations in support of the Rome Research Site property and all onsite personnel. - Continue providing facilities, facility operations, facility sustainment, support equipment, contracts, and associated costs to plan, manage and execute the following functions: fire prevention, disaster preparedness, plant operation and purchase of commodity, refuse collection, pavement clearance of snow and ice, grounds maintenance including landscaping, real property special inspections, pest control, and custodial services. - Continue providing Real Property Management and Engineering Services, including: (1) Facility Management and Administration and (2) Installation Engineering Services. Facility Management includes public works management costs, contract management, material procurement, facility data management, furnishings management costs, and real estate management. Installation Engineering Services includes annual inspection of facilities, master planning, overhead of planning and design, overhead of construction management, and non Site Recovery Management service calls. - Continue providing basic installation communication services, including long haul trunk and telecommunications services. - Continue providing site vehicle lease for logistics, security, and mission support under the Government Services Administration. - Continue to provide installation security for the entire Rome Research Site (includes Air Force Research Laboratory & Defense Finance and Accounting Service) FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 funding increased compared to FY 2025 by \$2.435 million due to updated average work year cost.			
Accomplishments/Planned Programs Subtotals		27.312	26.389
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
Not applicable			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
3600: Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)					PE 0603032F I Future AF Integrated Technology Demos							
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
Total Program Element	0.000	154.013	161.336	268.754	0.000	268.754	-	-	-	-	-	-
630320: Air Force Vanguard	0.000	154.013	161.336	268.754	0.000	268.754	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2024 Rocket Cargo (RC) and NTS-3 scope (\$48.373 million) was transferred to the United States Space Force (USSF) account 3620, Program 1206616SF Advanced Technology Development (ATD), Project 630321 Space Warfighter Technologist Capabilities. The FY 2025 PB occurred before the FY 2024 Appropriations, and therefore RC and NTS-3 were not transferred in the FY 2025 PB. This transfer was accomplished in the FY 2025 Congressional Intent table (Project Level Adjustment Tables to Accompany Division A, Title IV, Department of Defense, Full-Year Continuing Appropriations and Extensions Act, 2025), transferring \$58.204 million to the USSF PE.

Additionally, in FY 2025 this program received Congressionally directed reductions for "excess growth" of \$15.000 million and "historical underexecution" of \$13.966 million.

A. Mission Description and Budget Item Justification

This Program is a concentrated effort to evolve Air Force Research Laboratory (AFRL) business practices to accelerate transition of emerging technologies into the hands of the warfighter. Vanguard programs draw the operational, acquisition, and technology communities together into coherent teams to solve hard Science & Technology (S&T) problems based on Department of the Air Force (DAF) strategic priorities which do not have readily available emerging technology solutions.

Teams follow a disciplined process to accelerate efforts as deemed necessary by the department. This process (known as WARTECH, for WARfighter / TECHnologist) utilizes discrete progress gates to deliver S&T efforts organized as Vanguard Pathfinders, Vanguard Prospects, and Vanguard. This construct organizes these multi-disciplinary, capability-focused investments based on characteristics such as effort maturity, established military utility, technical viability and transitionability. Each progress gate has built-in off-ramps to promote transition. The process is overseen by an Executive Committee, whose membership includes the DAF Technical Leadership, operational requirements representatives, and acquisitions communities.

Vanguard Pathfinders are focused thrust areas which comprise numerous exploratory efforts intended to establish military utility and technical viability of concepts under exploration. Extensive socialization occurs within these efforts to inform activities inherent to these emerging investment areas. Concept socialization activities include but are not limited to the codification of the operational champion, planning engagements with other government R&D, exploratory outreach to industry and other non-traditional partners, and the initial identification of potential transition partners. These investments seek to identify and integrate emerging applied research efforts from government labs and/or industry into integrated technology demonstrations. Vanguard pathfinder teams seek to bring appropriate communities together to answer the question "are we solving the right problem" while establishing technical viability of the concepts under consideration. This phase can be accelerated or bypassed for efforts with well understood operational requirements and concepts with established technical viability. Pathfinders serve as the pipeline for DAF's future Vanguard Prospects and Vanguard.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force				Date: June 2025		
Appropriation/Budget Activity		R-1 Program Element (Number/Name)				
3600: Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)		PE 0603032F I Future AF Integrated Technology Demos				
Vanguard Prospects focus on maturing contributing technologies in accordance with the technical objectives of the effort while further engaging acquisitions communities and industry partners. Teams draw in technologies from multiple sources and ensure use of the right technologies. By establishing fielding strategies, teams solve the problem in a transitionable way. Vanguard Prospects provide focused S&T investment to accelerate the maturation of contributing technologies while laying the foundation for the effort to achieve full Vanguard status or transition into a Program of record. Vanguards build on the foundational work of the earlier stages, maturing and integrating contributing technologies to demonstrate solutions to the department's most pressing S&T problems based on DAF strategic requirements. Vanguard Programs - high risk by design - are focused, Secretary of the Air Force-priority initiatives with enterprise commitment. They are commissioned by the Assistant Secretary of the Air Force for Acquisition, Technology and Logistics, the Vice Chief of Staff of the Air Force, and the Vice Chief of Space Operations as DAF investments. This program element may include necessary civilian pay expenses required to manage, execute, and deliver science & technology capabilities. This program is in Budget Activity 3, Advanced Technology Development because this budget activity includes development of subsystems and components and efforts to integrate subsystems and components into system prototypes for field experiments and/or tests in a simulated environment. The FY 2026 request was reduced by \$0.487 million for Advisory and Assistance Services to promote efficiencies and advance the policies of the Administration in alignment with Executive Order 14222, "Implementing the President's Department of Government Efficiency Cost Efficiency Initiative." This program is in Budget Activity 3, Advanced Technology Development because this budget activity includes development of subsystems and components and efforts to integrate subsystems and components into system prototypes for field experiments and/or tests in a simulated environment.						
B. Program Change Summary (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Previous President's Budget		255.855	248.506	283.896	0.000	283.896
Current President's Budget		154.013	161.336	268.754	0.000	268.754
Total Adjustments		-101.842	-87.170	-15.142	0.000	-15.142
• Congressional General Reductions		-43.276	-28.966			
• Congressional Directed Reductions		0.000	0.000			
• Congressional Rescissions		0.000	0.000			
• Congressional Adds		2.434	0.000			
• Congressional Directed Transfers		-48.373	-58.204			
• Reprogrammings		0.000	0.000			
• SBIR/STTR Transfer		-4.328	0.000			
• Other Adjustments		-8.299	0.000	-15.142	0.000	-15.142

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)		R-1 Program Element (Number/Name) PE 0603032F I Future AF Integrated Technology Demos		
<u>Congressional Add Details (\$ in Millions, and Includes General Reductions)</u>		FY 2024	FY 2025	
Project: 630320: Air Force Vanguard				
Congressional Add: Program increase - automated geospatial intelligence detection algorithms		0.000	0.000	
Congressional Add: Program increase - mobile autonomous robotic swarms		2.434	-	
Congressional Add Subtotals for Project: 630320		2.434	0.000	
Congressional Add Totals for all Projects		2.434	0.000	
Change Summary Explanation				
The FY24 Congressional Add "Automated Geospatial Intelligence Algorithms" has no money listed because it was moved to PE 0603456F.				
FY 2024 Changes (-\$101.842 million):				
• Congressional: -\$43.3 million Unjustified growth (resulting from large cuts in FY23 during a PE merge, resulting in a large growth to the PB request for this PE in FY24), \$2.434 million in Congressional adds, and -\$48.4 million- NTS-3 & Rocket Cargo scope was transferred to the Space Force (PE 1206616SF)				
• SBIR/STTR Transfer: -\$4.328 million				
• Other Adjustments: -\$8.299 million for section-219				
FY 2025 Changes (-\$87.170 million):				
• Congressional: -\$28.966 million (\$15.000 million for excess growth and -\$13.966 million for historical underexection) and -\$58.204 million in directed transfers to the US Space Force (USSF) (PE 1206616SF) to support space unique S&T for NTS-3 and Rocket Cargo				
FY 2026 Changes (-\$15.142 million):				
• Other adjustments: -\$13.347 million funding to support NTS-3 & Rocket Cargo scope transferred to the USSF (PE 1206616SF), and -\$1.795 million for programmatic adjustments to the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency.				
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
Title: WARTECH		8.231	0.000	5.527
Description: The Department of the Air Force needs to provide game-changing leap-ahead capabilities to meet future force TECHnologist (WARTECH) process. The WARTECH process enables the DAF enterprise to collaboratively translate future force design priorities and requirements into targeted multi-disciplinary science and technology investments.				
WARTECH accelerates capability development and responds to emerging technology opportunities by supporting integrated concept exploration. These investments support activities such as mission thread analyses to demonstrate military utility and				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603032F <i>I Future AF Integrated Technology Demos</i>		
C. Accomplishments/Planned Programs (\$ in Millions) software and hardware feasibility assessments. Select efforts will evolve into either a Vanguard Pathfinder to allow for further assessment and maturation or be designated a Vanguard Prospect or Vanguard indicating enterprise-level priority. FY 2025 Plans: - Continue activities performing modeling, simulation, and analyses (MS&A) assessing the military utility of candidate Transformational Component investments. - Continue assessments informing decisions to promote candidate technologies into the WARTECH process. - Initiate partnering and leveraging of subject matter expertise from federally funded research and development centers, university-affiliated research centers, and other government agencies to advise and support technological ideation during the WARTECH process. FY 2026 Plans: - Continue activities performing MS&A assessing the military utility of candidate Transformational Component investments. - Continue assessments informing decisions to promote candidate technologies into the WARTECH process. - Continue partnering and leveraging of subject matter expertise from federally funded research and development centers, university-affiliated research centers, and other government agencies to advise and support technological ideation during the WARTECH process. - Initiate modeling, simulation, and analyses (MS&A) and capability development activities that enhance the DAF ability to support employment of joint all domain effects at speed and scale. - Initiate MS&A and capability development activities that degrade adversary ability to effectively employ joint all domain effects at speed and scale. - Initiate development of multi-mode sensing and cueing for various platforms to include High Value Airborne Assets (HVAA). - Initiate identification of current sensors and evaluate their efficacy for HVAA protect missions. - Initiate integration of sensing into sense-making for cueing the effector. - Initiate early systems engineering to develop a system of integrated Command and Control (C2) Decision Aids. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$5.527 million to support the planned scope and new MS&A work. In FY 2025 the funding was reduced significantly to support emerging higher priority, Vanguard Prospects (Swift Hammer, APEX GEAR, Scabbard Rage, and EO/IR Sensing Demonstration) which resulted in an increase in FY 2026.		FY 2024	FY 2025	FY 2026
Title: Navigation Technology Satellite 3 (NTS-3) Description: The Vanguard, Navigation Technology Satellite 3, develops and demonstrates advanced space-based navigation system technologies to provide resilient navigation support in contested environments. The demonstration includes a space-based test vehicle, ground-based enterprise command and control, and agile software defined receivers for the user.		0.000	0.000	0.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603032F <i>I Future AF Integrated Technology Demos</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
This thrust was realigned under US Space Force Account 3620, Program 1206616SF Advanced Technology Development (ATD), Project 630321 Space Warfighter Technologist Capabilities: 1. In FY 2024, FY 2024 money was transferred to the Space Force. At the time, FY 2025 funding was not transferred because the FY 2025 PB occurred prior to the FY 2024 Appropriations. 2. The Congressional Intent table (Project Level Adjustment Tables to Accompany Division A, Title IV, Department of Defense, Full-Year Continuing Appropriations and Extensions Act, 2025), transferred FY 2025 scope. FY 2025 Plans: This thrust was realigned under US Space Force Account 3620, Program 1206616SF Advanced Technology Development (ATD), Project 630321 Space Warfighter Technologist Capabilities. FY 2026 Plans: This thrust was realigned under US Space Force Account 3620, Program 1206616SF Advanced Technology Development (ATD), Project 630321 Space Warfighter Technologist Capabilities. FY 2025 to FY 2026 Increase/Decrease Statement: This thrust was realigned under US Space Force Account 3620, Program 1206616SF Advanced Technology Development (ATD), Project 630321 Space Warfighter Technologist Capabilities.				
Title: Rocket Cargo Description: The Vanguard, Rocket Cargo, is an S&T effort to leverage the multi-billion dollars of commercial investments in large reusable launch vehicles to extend the commercial rocket capabilities and create a novel DOD solution for global reach. DAF S&T efforts and resources are focused on the specific areas that are unique to military transport applications. The S&T objective is to determine the viability, performance, military utility, and business case of the commercial rocket capability. Potential investigation activities will include detailed mission and cost analyses, investigation of the harsh rocket plume interactions with landing surfaces, evaluation of rocket landing capabilities at austere sites, and human factors at landing sites. Investments will also determine the ability to airdrop cargo after reentry, will assess in-flight communications to the rocket, will test cargo environments and novel cargo "loadmaster" designs for rapid load/unload, and will evaluate rocket detectability and vulnerability. This thrust was realigned under US Space Force Account 3620, Program 1206616SF Advanced Technology Development (ATD), Project 630321 Space Warfighter Technologist Capabilities:		0.000	0.000	0.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603032F <i>I Future AF Integrated Technology Demos</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
1. In FY 2024, FY 2024 money was transferred to the Space Force. At the time, FY 2025 funding was not transferred because the FY 2025 PB occurred prior to the FY 2024 Appropriations. 2. The Congressional Intent table (Project Level Adjustment Tables to Accompany Division A, Title IV, Department of Defense, Full-Year Continuing Appropriations and Extensions Act, 2025), transferred FY 2025 scope. FY 2025 Plans: This thrust was realigned under US Space Force Account 3620, Program 1206616SF Advanced Technology Development (ATD), Project 630321 Space Warfighter Technologist Capabilities. FY 2026 Plans: - In the FY 2024 appropriation work in this effort was realigned under US Space Force Account 3620, Program 1206616SF Advanced Technology Development (ATD), Project 630321 Space Warfighter Technologist Capabilities. FY 2025 to FY 2026 Increase/Decrease Statement: This thrust was realigned under US Space Force Account 3620, Program 1206616SF Advanced Technology Development (ATD), Project 630321 Space Warfighter Technologist Capabilities.				
Title: Vanguard Prospect - Resolute Sentry Description: The Vanguard Prospect, Resolute Sentry, provides real-time multi-domain battlespace awareness in highly contested environments. Develops and demonstrates an autonomy foundation which integrates software and hardware capabilities to enable cross-domain, cross-platform Intelligence, Surveillance, and Reconnaissance (ISR) via autonomous platforms at the tactical edge in communications degraded and denied environments. Resolute Sentry fuses information from multiple off-board sources with on-board and networked sensors to provide higher fidelity information to the joint force as part of the Sensing Grid feed to the Joint All Domain Command and Control capability. Resolute Sentry leverages Open Mission Systems and Sensor Open Systems Architectures to maximize platform compatibility. FY 2025 Plans: - Continue assessments, development and maturation, integration, and testing of advanced sensor fusion, robust communications, and platform orchestration technologies integrated with advanced computing hardware for autonomous unmanned systems at the tactical edge. - Continue modeling, simulation, and analysis of system design trades and Model Based System Engineering activities. - Continue technology maturation of sensing systems integration, platform data fusion integration and orchestration, and advanced analytics for on-board autonomous systems, systems trades analyses, and software integration. - Continue software development and maturation of software/hardware mission management and multi-platform autonomous system orchestration efforts with industry for integration into the Systems Integration Laboratory/Hardware Integration Laboratory.		28.426	15.635	14.538

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603032F <i>I Future AF Integrated Technology Demos</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Continue software development interfaces with off-board systems connected to Joint All-Domain Command and Control enterprise. - Continue integration of robust communications applications with industry for highly contested environments. - Continue integrated systems testing and demonstration planning on experimentation platforms. - Complete hardware purchases for multi-platform flight testing and operational demonstration. - Continue Systems Integration Laboratory/Hardware Integration Laboratory, ground, and flight test planning and events supporting system demonstration and transition activities. - Continue transition analysis, planning and documentation of the overall system. FY 2026 Plans: - Complete assessments, development and maturation, integration, and testing of advanced sensor fusion, robust communications, and platform orchestration technologies integrated with advanced computing hardware for autonomous unmanned systems at the tactical edge. - Complete modeling, simulation, and analysis of system design trades and Model Based System Engineering activities. - Complete technology maturation of sensing systems integration, platform data fusion integration and orchestration, and advanced analytics for on-board autonomous systems, systems trades analyses, and software integration. - Complete software development and maturation of software/hardware mission management and multi-platform autonomous system orchestration efforts with industry for integration into the Systems Integration Laboratory/Hardware Integration Laboratory. - Complete software development interfaces with off-board systems connected to Joint All-Domain Command and Control enterprise. - Complete integration of robust communications applications with industry for highly contested environments - Complete integrated systems testing and demonstration planning on experimentation platforms. - Complete Systems Integration Laboratory/Hardware Integration Laboratory, ground, and flight test planning and events supporting system demonstration and transition activities. - Complete transition analysis, planning and documentation of the overall system. - Initiate and complete transition of software implementation and knowledge products. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$1.097 million due to the completion of integration efforts and software development maturation in FY 2026.				
Title: Vanguard Prospect - Long Range Kill Chain Description: The Vanguard Prospect, Long Range Kill Chain is prototyping and testing advanced techniques that utilize data sources from all domains to form and maintain the best possible targeting information against challenging adversary threats. This effort matures key special communications techniques and hardware required to utilize the assembled targeting information in		29.974	0.000	0.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603032F <i>I Future AF Integrated Technology Demos</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
tactically relevant timelines. The hardware and techniques matured under this effort will be inserted into the end-to-end Hawkeye kill chain.				
- Effort completed in FY 2024: Completed demonstration of over-the-air performance of special communications techniques with a specific radio intended for use in selected tactical platforms, including assessment against known and anticipated adversary threats. FY 2025 Plans: - Vanguard Prospect complete. FY 2026 Plans: - Vanguard Prospect complete. FY 2025 to FY 2026 Increase/Decrease Statement: Vanguard Prospect complete in FY 2024, no funding in either FY 2025 or FY 2026.				
Title: Vanguard Prospect - Area Effects Demonstration Description: The Vanguard Prospect, Area Effects Demo, advances the development of high-speed area effects concepts through a series of focused ground and flight test campaigns. Full program demonstration and collected data will enable advanced modeling and simulation (MS&A) tool development within relevant, actual, and approximate flight conditions. Program deliverables will improve understanding of hypersonic phenomena as well as provide risk reduction for future high-speed vehicle concepts and hypersonic multi-mission platforms. FY 2025 Plans: - Complete validating modeling and simulation tools using data obtained through ground testing of various flight-representative components. - Complete flight test integration activities to include software in the loop testing; hardware in the loop testing; environmental testing; and other form, fit, function, and acceptance testing. - Initiate and Complete flight testing, demonstrating the area effects concept. - Initiate post-test analysis using the flight test results, evaluate the accuracy of the pre-test simulations and inform future tool development efforts. FY 2026 Plans:		17.139	14.370	6.238

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603032F <i>I Future AF Integrated Technology Demos</i>		
C. Accomplishments/Planned Programs (\$ in Millions) - Complete post-test analysis using the flight test results, evaluate the accuracy of the pre-test simulations and inform future tool development efforts. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$8.132 million due to flight test and flight test integration completion in FY 2025.		FY 2024	FY 2025	FY 2026
Title: Vanguard Prospect - Fight Tonight Description: The Vanguard Prospect, Fight Tonight, develops and demonstrates a transformational gaming engine and artificial intelligence based military planning capability enabling the Department of the Air Force to develop, assess, and continuously adapt the employment of combat power at the pace and scale needed for peer conflict, achieving decision advantage across highly dynamic and contested environments. FY 2025 Plans: - Complete human-AI teaming assessment and apply findings to optimize system. - Complete demonstration of operational level planning capability on representative classified network and data, scaling software for digital plan rehearsal and plan adaptation and integrate with existing data used for operational mission. - Complete Systems Integration Laboratory deployment and user-driven assessment of software system effectiveness with Department of the Air Force operational planners. - Complete transition planning of the software Systems addressing critical Department of the Air Force process and technology gaps. - Initiate & complete integration with Air Operations Center software Systems of Record. FY 2026 Plans: - Vanguard Prospect complete. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$7.688 million due to the Vanguard Prospect Fight Tonight completing in FY 2025.		28.119	7.688	0.000
Title: Vanguard Prospect - CRONUS Description: The objective of the Combat Refueling & Operations Networked Universal System (CRONUS) program is a technology insertion into current and future manned and unmanned aerial refueling systems. CRONUS is an operational concept which enables "fueling the fight" - delivering fuel to airborne assets where and when needed to support the joint force to include contested areas. To project combat power, an airborne platform, whether it be a counter-air, strike, or Intelligence, Surveillance, and Reconnaissance (ISR), must be able to operate within contested or highly contested operational environments. The CRONUS concept includes real-time dynamic Air Refueling Battle Management (ARBM) and Automated Air-to-Air Refueling (A3R). The CRONUS ARBM effort will provide automation to the tracking and scheduling of aerial refueling within contested areas, while the		12.430	27.189	39.189

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603032F <i>I Future AF Integrated Technology Demos</i>		
C. Accomplishments/Planned Programs (\$ in Millions) A3R effort will focus on automating the mechanical aspects of the aerial refueling process to include automated refueling and receiving equipment. FY 2025 Plans: - Complete ARBM requirements analysis to inform ARBM algorithm attributes. - Continue ARBM algorithm development, test, and evaluation based on the modeling and simulation operational utility analysis and implement improvements to the algorithms required to improve system level performance. - Continue Model Based Systems Engineering (MBSE) collaboration with the program office to refine the system models and capture new aspects related to the CRONUS algorithm development. - Continue Hardware-In-the-Loop / Software-In-the-Loop (HIL/SIL) environment development and implementation. - Continue modeling and simulation operational utility analysis based on updates/improvements of the ARBM algorithms. - Complete A3R requirements analysis. - Continue modeling and simulation of A3R in relevant MBSE models. Advance MBSE tool and artifact development. - Continue the development of the sensors, logic, and algorithms necessary for tanker-receiver pairing as part of the A3R Relative Navigation system. - Continue the development of the fully automated mechanical system to enable automated air-to-air refueling as part of the A3R boom automation system. - Initiate certification with advanced analysis for ground testing of A3R's automated boom system - Initiate end-to-end system testing to demonstrate the ARBM capabilities with human-in-the-loop evaluations. - Initiate ARBM flight test preparation and planning to support initial flight demo in FY 2025 to inform design and utility. - Initiate A3R relative navigation lab and ground test planning and preparation for lab demonstration. - Initiate A3R boom automation lab and ground test planning and preparation for lab demonstration. FY 2026 Plans: - Continue ARBM algorithm development, test, and evaluation based on the modeling and simulation operational utility analysis. Implement improvements to the algorithms required to improve system level performance. - Continue Model Based Systems Engineering (MBSE) development and collaboration with the program office to refine the system models and capture new aspects related to the CRONUS algorithm development. - Continue Hardware-In-the-Loop / Software-In-the-Loop (HIL/SIL) environment development and implementation. - Continue modeling and simulation operational utility analysis based on updates/improvements of the Air Refueling Battle Management (ARBM) algorithms. - Continue modeling and simulation of Automated Air-to-Air Refueling (A3R) in relevant MBSE models. Advance MBSE tool and artifact development.		FY 2024	FY 2025	FY 2026

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603032F <i>I Future AF Integrated Technology Demos</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Continue the development of the sensors, logic, and algorithms necessary for tanker-receiver pairing as part of the A3R Relative Navigation system. - Continue the development of the fully automated mechanical system to enable automated air-to-air refueling as part of the A3R boom automation system. - Continue end-to-end system testing to demonstrate the ARBM capabilities with human-in-the-loop evaluations. - Complete A3R relative navigation lab and ground test planning and preparation and conduct lab demonstration. - Complete A3R boom automation lab and ground test planning and preparation and conduct lab demonstration. - Continue certification with advanced analysis for ground testing of A3R's automated boom system. - Complete ARBM flight test preparation and planning to support initial flight demo to inform design and utility. - Initiate A3R relative navigation flight test planning and preparation. - Initiate A3R boom automation flight test planning and preparation. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$12.000 million due to awarding five new contracts to three vendors for relative navigation and boom automation. These awards allow for the initiation of flight test planning and preparation of Automated Air-to-Air Refueling (A3R).				
Title: Vanguard Prospect - Ephemeral Paragon (E-Gon) Description: The Vanguard Prospect, E-Gon, is a comprehensive electromagnetic warfare (EW) solution being developed via open standards, utilizing adaptive/cognitive methodologies to meet the requirements of a complex and congested electromagnetic operating environment, specifically to address unknown and/or complex emitters. Rapid development, assessment, and integration of new techniques is needed to operate in an evolving electromagnetic spectrum environment which requires the ability to sense the electromagnetic spectrum and make decisions and/or recommendations based on an understanding of that environment. FY 2025 Plans: - Continue maturation efforts on electromagnetic warfare methodologies. - Continue algorithm maturation and assessment to support integration into minimum viable product. - Continue assessment and evaluation efforts for sub systems, and algorithms to test the minimum viable product. - Initiate integration of subsystems, algorithms, and electromagnetic warfare methodologies towards an instantiation of the minimum viable product. - Initiate incremental systems test and capabilities assessments of integrated components. FY 2026 Plans: - Continue and increase the rate of advancing the maturation of electromagnetic warfare methodologies.		8.272	15.297	36.871

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603032F <i>I Future AF Integrated Technology Demos</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Continue and increase the rate of advancing algorithm maturation and assessment supporting software integration. - Continue and increase the rate of advancing the assessment and evaluation efforts for subsystems, and algorithms to test the electronic warfare (EW) solution. - Continue and increase the rate of advancing integration of subsystems, algorithms, and electromagnetic warfare methodologies towards an EW solution. - Continue and increase the rate of advancing incremental systems test and capabilities assessments of integrated components. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$21.574 million due to the increase in all the ongoing activities as this effort awarded five new contracts to five vendors.				
Title: Vanguard Prospect - Swift Hammer Description: The Vanguard Prospect, Swift Hammer, is an S&T effort focused on the development and demonstration of key technologies for long-range, high-speed weapons. The program includes the development of propulsion subsystems and the integration of these subsystems for high-speed weapon airframes. The program will also investigate integrated design and manufacturing processes that reduce the production costs and can dramatically increase the production rates of long-range, high-speed weapons. Integral to these activities is high-fidelity modeling and simulation and model-based systems engineering to ensure the technology products developed transition smoothly to future high-speed weapon systems. Note: Early concept scoping was accomplished for this effort under the WARTECH thrust. Continued concept scoping was planned to be accomplished in FY 2025 under the Integrated Combat Effects (ICE) Vanguard Pathfinder captured in the FY 2025 PB. This effort matured sufficiently in FY 2024 to graduate into its own thrust, labeled Swift Hammer. The scope related to Swift Hammer was moved from the ICE Pathfinder into the Swift Hammer Vanguard Prospect. FY 2025 Plans: (Note: Swift Hammer graduated from the Integrated Combat Effects (ICE) Vanguard Pathfinder into its own Vanguard Prospect thrust. The scope related to Swift Hammer was moved from the ICE Pathfinder into this Thrust, specifically the 'Continued' scope originally fell under Integrated Combat Effects.) - Continue the design and development of the propulsion subsystem. - Continue the development of advanced modelling capabilities beyond the current state of the art for emerging employment approaches. - Continue the assessment of advanced weapon concepts in diverse operational scenarios. - Initiate manufacturing readiness assessments of key weapons system components to reduce manufacturing costs and enable rapid increases in production of weapons.		3.570	28.855	46.588

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603032F <i>I Future AF Integrated Technology Demos</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Initiate digital integration of the propulsion and other subsystems into a modular family of weapon designs from several weapon system contractors. FY 2026 Plans: - Continue the design and development of the propulsion subsystem. - Continue the development of advanced modelling capabilities for long-range, high-speed weapons employment approaches. - Continue the assessment of advanced weapon concepts in diverse operational scenarios - Continue manufacturing risk assessments of key components to identify cost reductions and rapid increases in production. - Continue digital integration of the propulsion subsystem into the refined weapon system demonstrator designs of multiple weapons system contractors. - Initiate hardware purchasing and testing. - Initiate propulsion subsystem testing. - Initiate advanced model verification and simulation of emerging employment approaches. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$17.733 million due to hardware procurement and testing, testing of propulsion systems, and verification work of models.				
Title: Vanguard Prospect - APEX GEAR Description: The Vanguard Prospect, APEX GEAR, develops and demonstrates human-in-the-loop automated planning software for accelerated resource allocation and exploration of plans modification opportunities optimized for outcomes diversified by potential adversary responses that are informed by near real time enemy order of battle at the scale of great power competition against a peer adversary. On completion, the software will begin transition to the Air Operations Center weapons system program of record. FY 2025 Plans: - Initiate data interoperability and experimentation activities with Air Operations Center weapons system software. - Initiate development of software to enable human oversight and modification of system generated air battle plans. - Initiate development of software for measuring adversary response against an air battle plan. - Initiate participation in military exercises to validate and measure benefits of automation over current manual human planning. FY 2026 Plans: - Continue data interoperability and experimentation activities with Air Operations Center weapons system software. - Continue development of software to enable human oversight and modification of system generated air battle plans. - Continue development of software for measuring adversary response against an air battle plan. - Continue participation in military exercises to validate and measure benefits of automation over current manual human planning.		-	7.682	22.941

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603032F <i>I Future AF Integrated Technology Demos</i>		
C. Accomplishments/Planned Programs (\$ in Millions) - Initiate development of automated data transfer into Air Operations Center weapons system to accelerate planning, addressing critical Department of the Air Force process and technology gaps. - Initiate data interoperability and experimentation activities with emerging theater air planning system of systems within the DAF BATTLE NETWORK. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$15.259 million due to automation efforts of weapons system data transfers and data interoperability and experimentation activities within the DAF BATTLE NETWORK.		FY 2024	FY 2025	FY 2026
Title: Vanguard Prospect - Scabbard Rage Description: The Vanguard Prospect, Scabbard Rage, identifies, assesses, integrates, and demonstrates material and non-material solutions to support EMS protection and survivability of air and space platforms, personnel, systems, systems of systems (SoS), and equipment. The Department of the Air Force has a need to protect personnel, facilities, and equipment from the effects of friendly, neutral, or enemy use of the electromagnetic spectrum (EMS) as well as naturally occurring phenomena that degrade, neutralize, or destroy combat capability. Note: Scabbard Rage matured out of the Integrated Combat Effects (ICE) and Integrated Electronic Warfare (IEW) Vanguard Pathfinders into its own Vanguard Prospect thrust. The scope related to Scabbard Rage was moved from the ICE & IEW Pathfinders into this thrust, specifically the 'Continued' scope in FY 2025 originally fell under ICE or IEW. FY 2025 Plans: - Continue modeling and simulation from material to vehicle to identify and mature EMS protection and integrate data into applicable program offices (from IEW). - Continue system, subsystem, and component level testing to baseline performance of EMS protection materials (from IEW). - Continue integration of EMS protection and survivability techniques and principles within select systems of interest in support of transition (from IEW). - Continue development of transition into industry for application into component and warfighter systems (from IEW). - Continue technology demonstration and training aid capabilities to develop tactics, training, and procedures for aircrew and platforms to operate in and around EMS contested environments (from IEW). - Continue activities to mature and demonstrate advanced technology solutions, components and sub-system prototypes and models to support large-scale, widely adopted all-domain warfighter operations (from ICE).		0.000	16.333	24.391

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603032F <i>I Future AF Integrated Technology Demos</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Initiate design and development of multi-domain experiment to rapidly mature EMS protection material solutions FY 2026 Plans: - Continue modeling and simulation from material to vehicle to identify and mature EMS protection and integrate data into applicable program offices. - Continue system, subsystem, and component level testing to baseline performance of EMS protection materials. - Continue integration of EMS protection and survivability techniques and principles within select systems of interest in support of transition. - Continue development of transition into industry for application into component and warfighter systems. - Continue technology demonstration and training aid capabilities to develop tactics, training, and procedures for aircrew and platforms to operate in and around electromagnetic spectrum (EMS) contested environments. - Continue activities to mature and demonstrate advanced technology solutions, components and sub-system prototypes and models to support large-scale, widely adopted all-domain warfighter operations. - Initiate design and development of multi-domain experiment to rapidly mature EMS protection material solutions. - Initiate demonstration planning, site survey, security and safety coordination. - Initiate Model-Based Systems Engineering (MBSE) of platform and system function, response, material performance, and behaviors. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$8.058 million due to multi-domain experimentation development, demonstration planning, and model-based systems engineering of platform and system function.				
Title: Vanguard Prospect - Payload Delivery System Description: The Vanguard Prospect Payload Delivery System is a Spacedrop Demonstration which expands upon the Rocket Cargo Vanguard, which leveraged the multi-billion-dollar commercial investments in large reusable launch vehicles to extend the commercial rocket capabilities and create a novel DOD solution for global reach. While Rocket Cargo S&T explored downmass and cargo delivery via rocket re-entry, this effort will investigate cargo downmass and delivery via capsule spacedrop and re-entry. The re-entry capsule approach has potential for increased cargo mass per launch and a broad diversity of launch solutions from medium-lift to super-heavy lift launch vehicles. The capsule S&T is inherently multi-disciplinary and multi-domain across air and space. Note: This in an ongoing effort that is dual funded by the USSF and USAF with the Air portion beginning in FY 2026. The scope shown here includes all the scope (both USAF and USSF) as both funding lines contribute to that scope. The funding shown here is only the USAF funding. The USSF funding can be found in USSF PE 1206616SF.		-	0.000	30.588

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603032F <i>I Future AF Integrated Technology Demos</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
FY 2025 Plans: This multi-domain effort was solely executed out of USSF PE 1206616SF in FY25 FY 2026 Plans: - Complete design and development of a multi-ton prototype capsule for demonstration of spacedrop, re-entry, and cargo deployment concepts for air/land/sea. - Complete modeling and simulation of the capsule re-entry aerodynamics, stability, heating, and technologies for rapid hypersonic deceleration. - Initiate studies of capsule payload environments and survivability, from spacedrop to payload delivery. - Initiate analyses of re-entry communications and plasma black-out. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$30.588 million due to initiation of studies in analyses for payload environments and re-entry communications. Additionally, initiation of USAF funding in FY 2026 to complete design and development of capsule prototype.				
Title: Vanguard Prospect - EO/IR Sensing Demonstration Description: This program focuses on developing and integrating advanced sensor technologies, algorithms, and autonomous systems to address detection and tracking challenges in a contested environment. It encompasses both algorithm development and hardware implementation for Electro-Optical/Infrared (EO/IR) payload systems, leveraging advancements in regional situational awareness products and prioritizing Concept of Operations (CONOPS) that enhance mission effectiveness. This program leverages state of the art technology to advance the Technology Readiness Levels of components and systems providing a transitionable solution to meet the requirements of the Department Air Force (DAF). FY 2025 Plans: - Initiate Modeling & Simulation (M&S) to enhance the M&S environment for more realistic scenarios and comprehensive algorithm testing. - Initiate real-time algorithm implementation by developing the core real-time algorithms for EO/IR sensor processing, focusing on basic detection and tracking functionality. - Initiate algorithm optimization by refining and optimizing the existing real-time algorithms based on test results and performance analysis, focusing on improving detection accuracy, tracking robustness, and computational efficiency. - Initiate software development & integration by developing the software framework and integration plans for the algorithms, hardware control, and data management.		-	22.322	34.235

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603032F <i>I Future AF Integrated Technology Demos</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Initiate and complete Concept Design Review (CDR) by finalizing the system architecture, specifications, hardware/software interfaces, and integration plans based on CDR feedback. FY 2026 Plans: - Continue Modeling and Simulation (M&S) by conducting simulations to evaluate the effectiveness of the algorithms against realistic scenarios and refine operational concepts. - Complete real-time algorithm implementation by developing the core real-time algorithms for EO/IR sensor processing, focusing on basic detection and tracking functionality. - Complete algorithm optimization by refining and optimizing the existing real-time algorithms based on test results and performance analysis, focusing on improving detection accuracy, tracking robustness, and computational efficiency. - Continue software development and integration by refine software interfaces and integrate the algorithms with the hardware platform being developed in the Demo program. - Initiate development of advanced algorithm capabilities, such as improved detection sensitivity, multi-target tracking, and sensor/data fusion. - Initiate work with the designated system integrator to ensure seamless transition of the technology. - Initiate planning integration of the situational awareness products to enable data sharing and collaborative operations. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$11.913 million due to developing advanced algorithms for detection sensitivity, multi-target tracking, and sensor data fusion, as well as work with the system integrator and integration planning.				
Title: Analysis for Emerging Vanguard Pipeline Description: Conduct operational analysis and mission thread engineering activities assessing military utility and cost-effective implementations of emerging technology opportunities under consideration in the WARTECH process. Due to Science and Technology portfolio reprioritization, this effort has been integrated into the WARTECH effort in this program. Funding moved to WARTECH in FY 2024 and FY 2025, as well as to the Vanguard Prospects within this Program Element. FY 2025 Plans: This effort has been integrated into the WARTECH effort in this program. Funding moved to WARTECH in FY 2024 and FY 2025 as well as to the Vanguard Prospects within this PE. FY 2026 Plans: This effort has been integrated into the WARTECH effort in this program. FY 2025 to FY 2026 Increase/Decrease Statement:		0.000	0.000	0.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603032F <i>I Future AF Integrated Technology Demos</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
This effort has been integrated into the WARTECH effort in this program. No funding in either FY2025 or FY 2026				
Title: Vanguard Pathfinder - Integrated Electronic Warfare Description: The Department of the Air Force has a need to identify and counter any use of electromagnetic spectrum (EMS) effects as well as naturally occurring phenomena that degrade, neutralize, or destroy friendly combat capability. This effort will characterize, simulate, and assess techniques to counter signals of interest through the full data processing chain of priority threat systems. Additionally, methods for distributed collection, electromagnetic emission, and battle management of distributed EW platforms will be developed. This effort includes algorithm and tool development with modeling, simulation, and analysis and hardware-in-the loop testing. Note: Scabbard Rage graduated from the Integrated Combat Effects (ICE) and Integrated Electronic Warfare (IEW) Vanguard Pathfinders into its own Vanguard Prospect thrust. The scope related to Scabbard Rage was moved from the ICE & IEW Pathfinders into its own thrust, these changes are reflected in FY 2025 & FY 2026 plans. FY 2025 Plans: (FY 2025 activities were relocated to the Scabbard Rage Vanguard Prospect) FY 2026 Plans: -Initiate planning activities to develop distributed EW battle management system to detect, characterize and counter adversary air defense systems. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$2.883 million to support the planned scope and the initiation of multiple EW efforts. In FY 2025 the funding was reduced significantly to support the emerging higher priority Vanguard Prospects (Swift Hammer and APEX GEAR) and the maturation of Scabbard Rage, an effort within IEW, into its own Vanguard Prospect, which results in an increase in FY 2026.		1.732	0.000	2.883
Title: Vanguard Pathfinder - Integrated Networks Description: The Department of the Air Force has a need to communicate with Joint and Coalition partners and to provide battle management during complex military operations. This effort identifies and assesses accessible, resilient, and secure bidirectional information exchange technology solutions, components, and sub-systems, to enable seamless movement of data to the right place at the right time informing effective decision making on military relevant timescales. Efforts support the integration of applications and algorithms into flexible hardware and software architectures to achieve movement of appropriate data across multiple security levels, and modeling and simulation to assess information exchanges for large-scale all-domain warfighter operations.		2.458	5.965	4.765

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603032F <i>I Future AF Integrated Technology Demos</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
FY 2025 Plans: - Continue development of next-generation cross domain solutions through design and prototyping. - Continue ground emulation evaluation of hardware and software applications received from selected vendors to assess scalability of emerging technologies. Emulation environment to include hardware and software necessary to optimally route mission data across multiple security levels and heterogenous networks. - Initiate the MS&A integration with multi-domain data transport efforts to assess how networks from multiple domains enhance aerial network & kill-chain in complex information security use cases to identify risks, challenges and synergies. Assess scalability to large number of network nodes in air and mission performance under various network conditions. - Initiate integration of software and hardware designs to address any deficiencies discovered during ground simulations. - Initiate integrated demonstration planning. FY 2026 Plans: - Continue development of next-generation cross domain solutions through design and prototyping of software services that enable discoverability and reconfigurability of cross domain solution functions. - Continue ground emulation evaluation of hardware and software applications received from selected vendors to assess scalability of emerging technologies. Emulation environment to include hardware and software necessary to optimally route mission data across multiple security levels and heterogenous networks. - Continue the MS&A integration with multi-domain data transport efforts to assess how networks from multiple domains enhance aerial network & kill-chain in complex information security use cases to identify risks, challenges and synergies. Assess scalability to large number of network nodes in air and mission performance under various network conditions. - Continue integration of software and hardware designs to address any deficiencies discovered during ground simulations and functionality with airborne information management services. - Initiate component level capability demonstration to include over-the-air testing of integrated components necessary for multi-domain, multi-security level data transport in degraded network conditions. - Initiate planning and early systems engineering for development of autonomous/AI aided software microservices that will serve as C2 decision aids enabling Battle Staff and Battle Managers to more rapidly process information and make decisions critical to the employment of kinetic and non-kinetic effects across multi-domain and integrated kill chains. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$1.200 million due to the emerging higher priorities within this Program. AF funding for Vanguard Prospect Payload Delivery System beings in FY 2026 and large increases to Swift Hammer, E-Gon, APEX GEAR, and EO/IR Sensing Demonstration in FY 2026 results in less available money for important, but lower priority, Vanguard Pathfinders.				
Title: Vanguard Pathfinder - Advanced Emulation for Test and Training		0.000	0.000	0.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603032F <i>I Future AF Integrated Technology Demos</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
Description: The Department of Air Force has a need to prepare our forces for joint military operations through simulation of major conflicts and training activities. This effort integrates, assesses, and demonstrates mature science and technology solutions supporting test and training in the synthetic environment to enable future force operations. Note: The funding for this thrust was reprioritized to support the overall program. No work was performed in this thrust for FY 2024 and FY 2025. FY 2025 Plans: (Note: work planned in this effort did not occur due to general reductions and higher Science and Technology portfolio priorities within this program.) FY 2026 Plans: - No work planned in this thrust in FY 2026. FY 2025 to FY 2026 Increase/Decrease Statement: No work or funding is planned in either FY 2025 or FY 2026 for this thrust.				
Title: Vanguard Pathfinder - Integrated Combat Effects Description: The Department of the Air Force has a need to pursue leap ahead technologies to enable offensive and defensive warfighting combat effects. Investments should develop, assess and demonstrate standoff capabilities with increased responsiveness and affordability to jointly deter or blunt peer-adversary offensive operations. Note: A portion of Integrated Combat Effects (ICE) moved into the Vanguard Prospect Scabbard Rage. Scabbard Rage graduated from the Integrated Combat Effects (ICE) and Integrated Electronic Warfare (IEW) Vanguard Pathfinders into its own Vanguard Prospect thrust. The scope related to Scabbard Rage was moved from the ICE & IEW Pathfinders into its own thrust, these changes are reflected in FY 2025 & FY 2026 plans. In FY 2025, funding and effort moved to Scabbard Rage and EO/IR Sensor Demonstration. Additionally, future work planned for FY 2026 moved into the recently approved (June 25) Vanguard Prospect EO/IR Sensing Demonstration. FY 2025 Plans:		11.228	0.000	0.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603032F <i>I Future AF Integrated Technology Demos</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
All work for FY 2025 was moved into Scabbard Rage.				
FY 2026 Plans: All work for FY 2026 was moved into Scabbard Rage and EO/IR Sensing Demonstration.				
FY 2025 to FY 2026 Increase/Decrease Statement: No work or funding is planned in either FY 2025 or FY 2026 for this thrust.				
Accomplishments/Planned Programs Subtotals		151.579	161.336	268.754
		FY 2024	FY 2025	
Congressional Add: Program increase - automated geospatial intelligence detection algorithms		0.000	0.000	
FY 2024 Accomplishments: Conducted Congressionally-directed research.				
FY 2025 Plans: Congressional add was re-programmed out of this PE				
Congressional Add: Program increase - mobile autonomous robotic swarms		2.434	-	
FY 2024 Accomplishments: Conducted Congressionally-directed research.				
Congressional Adds Subtotals		2.434	0.000	
D. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
E. Acquisition Strategy				
Not applicable				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force	Date: June 2025

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603112F / <i>Advanced Materials for Weapon Systems</i>

COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
Total Program Element	0.000	55.005	32.161	31.021	0.000	31.021	-	-	-	-	-	-
632100: <i>Electromagnetic Protection Materials</i>	0.000	12.331	13.580	13.571	0.000	13.571	-	-	-	-	-	-
633153: <i>Non-Destructive Inspection Development</i>	0.000	4.941	4.573	4.684	0.000	4.684	-	-	-	-	-	-
633946: <i>Materials Transition</i>	0.000	37.733	14.008	12.766	0.000	12.766	-	-	-	-	-	-

Note

In FY 2026, Project 632100, Laser Hardened Materials, was renamed Electromagnetic Protection Materials to more accurately describe the project's scope.

A. Mission Description and Budget Item Justification

The Air Force Research Laboratory (AFRL) is focused on high-impact, multi-domain science & technology (S&T) solutions that drive innovation now while laying the groundwork for the Air and Space Force to win the future fight. AFRL effectively synchronizes the Department of the Air Force (DAF) S&T enterprise and workforce to align towards the most consequential DAF priorities and accelerate the delivery of game-changing S&T.

This program develops and demonstrates advanced materials and process technologies to satisfy Department of the Air Force requirements in areas such as survivability, readiness, affordability, and new processes and materials. These projects ensure the Department of the Air Force weapon systems are ready and able when needed.

Funds in this PE may be used to investigate specified technology advancements in air, space and/or cyber domains.

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

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force			Date: June 2025			
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)		R-1 Program Element (Number/Name) PE 0603112F I Advanced Materials for Weapon Systems				
B. Program Change Summary (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Previous President's Budget		30.372	29.661	31.291	0.000	31.291
Current President's Budget		55.005	32.161	31.021	0.000	31.021
Total Adjustments		24.633	2.500	-0.270	0.000	-0.270
• Congressional General Reductions		0.000	0.000			
• Congressional Directed Reductions		0.000	0.000			
• Congressional Rescissions		0.000	0.000			
• Congressional Adds		30.500	2.500			
• Congressional Directed Transfers		-3.033	0.000			
• Reprogrammings		0.000	0.000			
• SBIR/STTR Transfer		-1.740	0.000			
• Other Adjustments		-1.094	0.000	-0.270	0.000	-0.270
Congressional Add Details (\$ in Millions, and Includes General Reductions)						
Project: 633946: Materials Transition						
Congressional Add: Program increase - Metals affordability initiative						
Congressional Add: Program increase - polymer printing technology for additive manufacturing						
Congressional Add: Program increase - advanced carbon materials for sensor and aerospace platform protection						
Congressional Add: Program increase - certification for advanced materials						
Congressional Add Subtotals for Project: 633946						
Congressional Add Totals for all Projects						
Change Summary Explanation						
The FY 2026 request was reduced by \$0.175 million for Advisory and Assistance Services to promote efficiencies and advance the policies of the Administration in alignment with Executive Order 14222, "Implementing the President's Department of Government Efficiency Cost Efficiency Initiative."						
In FY 2024, the Congressionally Directed Transfer of \$3.033 million was due to the realignment of space unique S&T to Unites States Space Force RDT&D, PE 1206616SF, Space Advanced Technology Development/Demo; Project 633834, Project Integrated Space Technology Demonstrations; Effort: Advanced Materials for Spacecraft Resilience.						
In FY 2024, the decrease of \$1.094 million in Other Adjustments was due to realignment of funds to PE 0602212F, Defense Laboratories R&D Projects, to implement the Department of Defense (DoD) Funding Laboratory Enhancements Across Four Categories (FLEX-4) authority under 10 U.S.C. Section 4123.						

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 3					R-1 Program Element (Number/Name) PE 0603112F / <i>Advanced Materials for Weapon Systems</i>				Project (Number/Name) 632100 / <i>Electromagnetic Protection Materials</i>			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
632100: <i>Electromagnetic Protection Materials</i>	0.000	12.331	13.580	13.571	0.000	13.571	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Within Project 632100, Electromagnetic Protection Materials, the following effort name changes occurred:

In FY 2026, the Aerospace Systems Protection effort was renamed the Electromagnetic Protection for Aerospace Systems effort to better reflect its focus.

In FY 2026, the Aircrew Protection effort was renamed the Electromagnetic Protection for Personnel effort to better reflect its focus.

A. Mission Description and Budget Item Justification

This project develops and demonstrates advanced materials and technologies to enable Department of the Air Force personnel, weapons, platforms, and mission-systems to operate with impunity in extreme electromagnetic spectrum environments. These extreme electromagnetic spectrum environments include those caused by deliberate electromagnetic radiation from Directed Energy Weapons (both laser and radio frequency) and nuclear detonation.

In FY 2024 and beyond, work related to protection of space-based platforms is accomplished in PE 1206616SF: Space Advanced Technology Development/Demo; Project 633834: Project Integrated Space Technology Demonstrations; Effort: Advanced Materials for Spacecraft Resilience.

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

	FY 2024	FY 2025	FY 2026
Title: Electromagnetic Protection for Aerospace Systems	7.002	8.442	8.436
Description: In FY 2026, this effort was renamed from "Aerospace Systems Protection" to "Electromagnetic Protection for Aerospace Systems" to better reflect the scope of the technology.			
This project develops and demonstrates electromagnetic protection technologies that enable survivability of Department of the Air Force platforms, systems, and components to ensure mission effectiveness in extreme electromagnetic spectrum environments.			
FY 2025 Plans: - Continue developing, integrating, assessing, and transitioning advanced electromagnetic protection technologies for current and future Department of the Air Force platforms and systems with specific focus on those capabilities prioritized by warfighter needs. - Continue to apply computational materials science to model materials characteristics, aiming to increase the accuracy of predictions and shorten the design cycle time. These results will iteratively refine the models for future material design.			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 3		R-1 Program Element (Number/Name) PE 0603112F / <i>Advanced Materials for Weapon Systems</i>		Project (Number/Name) 632100 / <i>Electromagnetic Protection Materials</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
- Continue analyzing the high-performance properties of semiconductor materials designed to protect electro- optic imaging sensors. - Continue developing of materials for survivable next generation aircraft sensor systems. - Complete development of laser countermeasures for survivability of dynamic electro-optic/infrared imagers. - Complete employment and integration of evolved computational materials science to model materials characteristics to increase accuracy and shorten design cycle time of coatings development for use in sensor hardening. FY 2026 Plans: - Continue developing, integrating, assessing, and transitioning advanced electromagnetic protection technologies for current and future Department of the Air Force platforms and systems with specific focus on those capabilities prioritized by warfighter needs. - Continue to apply computational materials science to model materials characteristics, aiming to increase the accuracy of predictions and shorten the design cycle time. These results will iteratively refine the models for future material design. - Continue analyzing the high-performance properties of semiconductor materials designed to protect electro-optic imaging sensors. - Continue developing materials for survivable next generation aircraft sensor systems. - Initiate development of protection materials and material processing for survivable next generation munitions. - Initiate transitioning technologies and integrating the developments into light-weight, low-cost survivable electro-optic sensors that provide full spectrum protection for missile warning. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$0.006 million due to programmatic adjustments within the Science and Technology portfolio that reflects a strategic realignment.					
Title: Electromagnetic Protection for Personnel Description: In FY 2026, this effort was renamed from "Aircrew Protection" to "Electromagnetic Protection for Personnel" to better describe the scope of the work. This effort develops and demonstrates materials technologies that enhance protection for Department of the Air Force personnel to ensure safety and to enable crews to perform required missions in a threat environment. FY 2025 Plans: - Continue developing, validating, demonstrating, and transitioning laser protection materials and technologies for personnel protection. - Continue advancing transition efforts and development of visor-based aircrew protection materials with agile protection.			5.329	5.138	5.135

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 3		R-1 Program Element (Number/Name) PE 0603112F / <i>Advanced Materials for Weapon Systems</i>		Project (Number/Name) 632100 / <i>Electromagnetic Protection Materials</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
- Continue evaluating and assessing materials and advances in characterization and demonstration of eye protection technologies using computational materials science tools. - Continue transitioning, validating, maturing, and testing improvements to the functionality and performance of personnel protection technologies under expected operational conditions. - Continue development and testing of materials technologies to protect against nuclear flash blindness. FY 2026 Plans: - Continue developing, integrating, assessing, and transitioning electromagnetic protection materials and technologies to mitigate risks to aircrew eyes from lasers and nuclear flash blindness. - Continue transition efforts and further advancing development of visor-based aircrew protection technologies. - Continue evaluating and assessing materials and advances in characterization techniques for eye protection technologies using computational materials science tools. - Continue transitioning, validating, maturing, and testing improvements to the functionality and performance of personnel protection technologies under expected operational conditions. - Continue development and testing of materials technologies to protect against nuclear flash blindness. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$0.003 million due to programmatic adjustments within the Science and Technology portfolio that reflects a strategic realignment.					
Accomplishments/Planned Programs Subtotals			12.331	13.580	13.571
C. Other Program Funding Summary (\$ in Millions)					
N/A					
Remarks					
D. Acquisition Strategy					
N/A					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 3					R-1 Program Element (Number/Name) PE 0603112F / <i>Advanced Materials for Weapon Systems</i>				Project (Number/Name) 633153 / <i>Non-Destructive Inspection Development</i>			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
633153: <i>Non-Destructive Inspection Development</i>	0.000	4.941	4.573	4.684	0.000	4.684	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Within Project 633153, Non-Destructive Inspection Development, the work in the Special Material Inspection Technologies and Advanced System Monitoring Technologies efforts will be consolidated into single effort under the existing Advanced System Monitoring Technologies effort to accelerate technological advancement in inspection and monitoring of specialty materials because the research becomes more interdependent as the technology advances.

A. Mission Description and Budget Item Justification

This project develops and demonstrates advanced nondestructive inspection and evaluation technologies to monitor performance integrity and to detect failure causing conditions in weapon systems components and materials. Nondestructive inspection and evaluation capabilities greatly influence and/or limit many design, manufacturing, and maintenance practices. This project provides technology to satisfy Department of the Air Force requirements to extend the lifetime of current systems through increased reliability and cost-effectiveness at field and depot maintenance levels to include reduced manhours through automation. Equally important is assuring manufacturing quality, integrity, and safety requirements are built in.

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

<i>Title:</i> Special Material Inspection Technologies	FY 2024	FY 2025	FY 2026
<i>Description:</i> In FY 2026, within this Project, the work and funding of the Special Material Inspection Technologies effort will be consolidated into the Advanced System Monitoring Technologies effort to synergistically accelerate technological advancements in the inspection and monitoring of specialty materials.	1.236	1.143	0.000
Develop and demonstrate advanced inspection technologies supporting special material systems to enhance affordability and ensure full performance and survivability.			
<i>FY 2025 Plans:</i>			
- Complete within this effort the transition process to depots and flight lines for improved methods to acquire and analyze data to facilitate improved characterization, registration, and tracking of degradation and damage to special materials that enables/ensures more affordable coatings assessment.			
- Complete within this effort validating tools to improve characterization and failure modes of specialty multilayer coatings.			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 3		R-1 Program Element (Number/Name) PE 0603112F / <i>Advanced Materials for Weapon Systems</i>		Project (Number/Name) 633153 / <i>Non-Destructive Inspection Development</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
- Complete within this effort developing automation for robotic technologies for visual inspections that will realize human-assisted inspection capabilities and provide capabilities for automated multi-spectral characterization. FY 2026 Plans: In FY 2026 and beyond, this effort's plans and funding will be integrated with the Advanced System Monitoring Technologies effort in Project 633153, Non-Destructive Inspection Development, to enhance synergy and accelerate the overall technological development of specialty material monitoring and inspection. The Advanced System Monitoring Technologies effort's plans and funding have been updated accordingly. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 funding decreased compared to FY 2025 by \$1.143 million due to strategic realignment of the work and funding in this effort to the Advanced System Monitoring Technologies effort within this Project to accelerate technological advancement in inspection and monitoring of specialty materials as the technology converges.					
Title: Advanced System Monitoring Technologies Description: In FY 2026, the work and funding associated with the Special Material Inspection Technologies effort in this Project, will be merged into this effort to accelerate technological advancement in inspection and monitoring of specialty materials. Development and transition advanced nondestructive inspection/evaluation (NDI/E) capabilities for data acquisition, analysis, and integration for enhanced damage detection and characterization in composite and specialty materials coatings on aircraft. This supports just-in-time maintenance, increased mission availability, and enables more affordable inspections, including automated robotic technologies. FY 2025 Plans: - Continue demonstrating advanced analytical methods to more accurately assess the location, and register spatial location, of damage detected using nondestructive inspection data and results. - Continue enhanced methods for compiling, reporting, collecting and rapidly analyzing digital nondestructive testing and evaluation data necessary for improved damage detection and characterization. - Continue demonstrating and transitioning technologies to locate damage to composite structures without coating removal and to inspect composite structures with complex geometry. - Continue the transition and integration of computational materials science tools to provide data necessary for life prediction methods to enable risk-based life management. - Complete development of augmented reality technologies to improve the process of performing non-destructive evaluation tasks, acquiring and archiving data and reporting results, and enabling improved inspector guidance and visualization.			3.705	3.430	4.684

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603112F / <i>Advanced Materials for Weapon Systems</i>	Project (Number/Name) 633153 / <i>Non-Destructive Inspection Development</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Complete development and transition of novel approaches to collect, analyze, transport, archive, and use digital nondestructive inspection data and information. FY 2026 Plans: - Continue demonstrating and transitioning technologies to locate damage to composite structures without coating removal and to inspect composite structures with complex geometry resulting in higher mission availability. - Continue enhanced methods for compiling, reporting, collecting and rapidly analyzing digital nondestructive testing and evaluation data necessary for improved damage detection and characterization on aircraft. - Continue the transition and integration of computational materials science tools to provide data necessary for life prediction methods to enable risk-based life management. - Initiate within this effort the transition process to depots and flight lines for improved methods to acquire and analyze data to facilitate improved characterization, registration, and tracking of degradation and damage to specialty materials that enables/ ensures more affordable coatings assessment. (This work was accomplished in Special Material Inspection Technologies effort in FY 2025.) - Initiate within this effort validating tools to improve characterization and failure modes of specialty multilayer coatings to increase mission availability. (This work was accomplished in Special Material Inspection Technologies effort in FY 2025.) - Initiate within this effort developing automation for robotic technologies for visual inspections that will realize human-assisted inspection capabilities and provide capabilities for automated multi-spectral characterization reducing inspection/maintenance manhours. (This work was accomplished in Special Material Inspection Technologies in FY 2025.) FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 funding increased compared to FY 2025 by \$1.254 million due to: 1) standard budget fluctuations of \$0.111 million and 2) the transfer of plans and funding of \$1.143 million from the Special Material Inspection Technologies effort within this Project that will accelerate technological advancement in inspection and monitoring of specialty materials as the technology converges.			
Accomplishments/Planned Programs Subtotals		4.941	4.573
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 3					R-1 Program Element (Number/Name) PE 0603112F / Advanced Materials for Weapon Systems				Project (Number/Name) 633946 / Materials Transition			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
633946: Materials Transition	0.000	37.733	14.008	12.766	0.000	12.766	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
This project develops and demonstrates advanced materials and processing technologies for fielded and planned Department of the Air Force weapon, airframe, aerospace structure, protection, and propulsion applications. Advanced materials and processes that have matured beyond applied research are characterized, critical data are collected, and critical evaluations in the proposed operating environment are performed. This design and scale-up data improves the overall affordability of promising materials and processing technologies, providing needed initial incentives for their industrial development.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2024	FY 2025	FY 2026	
Title: Air Vehicle Materials Technologies									4.152	6.508	6.766	
Description: Develop and demonstrate materials and processes technologies for air vehicle and subsystems to enhance lift, propulsion, power generation management, survivability, and affordability of air vehicles.												
FY 2025 Plans: - Continue development and characterization of materials for next-generation electromagnetic protection												
FY 2026 Plans: - Continue development and characterization of materials for next-generation electromagnetic protection. - Initiate development and transitioning of materials and processes for minimizing electromagnetic interference in systems with minimal performance degradation.												
FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$0.258 million due to initiation of research to minimize electromagnetic interference.												
Title: Counter Intelligence, Surveillance, and Reconnaissance Technologies									4.000	5.000	6.000	
Description: Develop and demonstrate multiple physical and technical methods for the degradation of adversarial Intelligence, Surveillance, and Reconnaissance (ISR) collection and analysis supporting resilient basing and Agile Combat Employment Concepts of Operations (CONEMPS). These efforts will delay enemy decisions and actions, furthering Department of the Air Force mission goals. This work directly supports both passive airbase defense and overall theater operations.												
FY 2025 Plans: - Continue developmental efforts in counter ISR technologies across multiple collection domains in a tactically coordinated way that considers all relevant operational environments.												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603112F / <i>Advanced Materials for Weapon Systems</i>	Project (Number/Name) 633946 / <i>Materials Transition</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Continue development of a closed-loop simulation in a digital test environment with a human in the loop and quantify the utility of techniques incorporating cost, size, weight and power requirements. FY 2026 Plans: - Continue developmental efforts in counter ISR technologies across multiple collection domains in a tactically coordinated way that considers all relevant operational environments. Evaluate first generation prototypes in the laboratory environment; passing that test, perform operationally relevant environment testing. - Continue development of a closed-loop simulation in a digital test environment with a human in the loop and quantify the utility of techniques incorporating cost, size, weight and power requirements to obscure operations. - Initiate new methods and materials development to allow ruggedization of deliverables for all relevant environments; emphasize improvements for ease of use by operators in the field. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 funding increased compared to FY 2025 by \$1.000 million due to ruggedization of prototype samples to meet the demands of transport, storage, and fielding in operationally relevant environments.			
Accomplishments/Planned Programs Subtotals		8.152	11.508
		FY 2024	FY 2025
Congressional Add: Program increase - Metals affordability initiative		2.424	2.500
FY 2024 Accomplishments: Conducted Congressional directed efforts.			
FY 2025 Plans: Conduct Congressional directed efforts.			
Congressional Add: Program increase - polymer printing technology for additive manufacturing		4.849	0.000
FY 2024 Accomplishments: Conducted Congressionally directed efforts.			
FY 2025 Plans: Not applicable			
Congressional Add: Program increase - advanced carbon materials for sensor and aerospace platform protection		4.849	0.000
FY 2024 Accomplishments: Conducted Congressionally directed efforts.			
FY 2025 Plans: Not applicable			
Congressional Add: Program increase - certification for advanced materials		17.459	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603112F / Advanced Materials for Wea pon Systems	Project (Number/Name) 633946 / Materials Transition
	FY 2024	FY 2025
FY 2024 Accomplishments: Conducted Congressionally directed efforts.		
FY 2025 Plans: Not applicable		
Congressional Adds Subtotals	29.581	2.500
C. Other Program Funding Summary (\$ in Millions)		
N/A		
Remarks		
D. Acquisition Strategy		
N/A		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force	Date: June 2025

Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>					PE 0603199F / <i>Sustainment Science and Technology (S&T)</i>							
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
Total Program Element	0.000	9.710	5.668	12.915	0.000	12.915	-	-	-	-	-	-
635351: <i>Technology Sustainment</i>	0.000	9.710	5.668	12.915	0.000	12.915	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2026, within Project 635351, Technology Sustainment, the Prevention/Enhanced Maintainability Technologies effort was renamed Affordable Survivability Technologies to better reflect the project's focus on affordable, survivable materials and processes.

A. Mission Description and Budget Item Justification

The Air Force Research Laboratory (AFRL) is focused on high-impact, multi-domain science & technology (S&T) solutions that drive innovation now while laying the groundwork for the Air and Space Force to win the future fight. AFRL effectively synchronizes the Department of the Air Force (DAF) S&T enterprise and workforce to align towards the most consequential DAF priorities and accelerate the delivery of game-changing S&T.

This program develops and transitions AFRL readiness technologies for fielded and future Department of the Air Force systems. These technologies include corrosion/erosion prevention, maintenance/repair techniques, state awareness/non-destructive inspection, and health management and life prediction. Matured and demonstrated technologies increase lethality and readiness by improving the affordability and availability of aerospace weapon systems. This is achieved by reducing sustainment costs, extending service life, and maintaining mission readiness and capability. Studies are conducted to analyze processes and methodologies for applying these technologies to address sustainment issues across the force. These studies identify cross-cutting applications for fielded systems and opportunities for building sustainability into future weapon systems. This program also develops and demonstrates affordable advanced composites and specialty materials for current and future weapon systems.

Funds in this PE may be used to investigate specified technology advancements in air, space and/or cyber domains.

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

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force				Date: June 2025		
Appropriation/Budget Activity		R-1 Program Element (Number/Name)				
3600: Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)		PE 0603199F I Sustainment Science and Technology (S&T)				
B. Program Change Summary (\$ in Millions)	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	
Previous President's Budget	10.478	12.558	12.965	0.000	12.965	
Current President's Budget	9.710	5.668	12.915	0.000	12.915	
Total Adjustments	-0.768	-6.890	-0.050	0.000	-0.050	
• Congressional General Reductions	0.000	0.000				
• Congressional Directed Reductions	0.000	-6.890				
• 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	-0.349	0.000				
• Other Adjustments	-0.419	0.000	-0.050	0.000	-0.050	
Change Summary Explanation						
The FY 2026 request was reduced by \$0.010 million for Advisory and Assistance Services to promote efficiencies and advance the policies of the Administration in alignment with Executive Order 14222, "Implementing the President's Department of Government Efficiency Cost Efficiency Initiative."						
In FY 2024, the decrease of \$0.419 million in Other Adjustments was due to realignment of funds to PE 0602212F, Defense Laboratories R&D Projects, to implement the Department of Defense (DoD) Funding Laboratory Enhancements Across Four Categories (FLEX-4) authority under 10 U.S.C. Section 4123.						
In FY 2025, the Congressionally Directed Reduction of \$6.890 million was due to prevention/enhanced maintainability technologies unjustified growth.						
Increase from FY 2025 to FY 2026 in Current budget request is due to acceleration of activities in Affordable Survivable Technology.						
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2024	FY 2025	FY 2026
Title: Affordable Survivability Technologies				5.050	5.568	12.915
Description: In FY 2026, this effort was renamed "Affordable Survivability Technologies" from "Prevention/Enhanced Maintainability Technologies" to more accurately describe its focus.						
This effort develops, demonstrates, and transitions affordable survivability technologies to reduce weapon system production and sustainment costs, while enabling advanced aircraft and weapon systems to operate with superiority in contested environments.						
FY 2025 Plans:						
- Continue rapid repair and materials development for aircraft battle damage repair of advanced fighter aircraft.						
- Continue advanced canopy technology development.						

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603199F <i>I Sustainment Science and Technology (S&T)</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Continue total body nondestructive evaluation system for outer mold line inspection of advanced fighter aircraft. - Continue to develop, demonstrate, and transition maintenance and sustainment technologies to improve component design, maintenance, repair, replacement, and concepts for maintainer training, extending part life, and reduced maintenance burden spanning Department of the Air Force mission areas of Air, Space, and Cyber. - Pause activities to demonstrate high reliability of repair and maintenance technologies to increase service time between maintenance actions. - Pause development of materials and processes to reduce maintenance burden on aerospace systems. - Pause work to develop system fleet management decision-making tools, maintenance/repair database technologies and techniques, and supply chain/infrastructure approaches to reduce sustainment costs. These efforts span Department of the Air Force mission areas of Air, Space, and Cyber. FY 2026 Plans: - Continue rapid repair and materials development for aircraft battle damage repair of advanced fighter aircraft increasing mission availability. - Continue to accelerate advanced durable aircraft canopy technology development to reduce maintenance burden on aerospace systems. - Continue acceleration of total body nondestructive evaluation system for outer mold line inspection of advanced aircraft. - Continue to develop, demonstrate, and transition maintenance and sustainment technologies to improve component design, maintenance, repair, replacement, and concepts for maintainer training, extending part life, and reduced maintenance burden spanning Department of the Air Force mission areas. - Re-initiate and accelerate activities to demonstrate high reliability of repair and maintenance technologies to increase service time between maintenance actions, reducing demands on depots. - Re-initiate and accelerate development of materials and processes to reduce maintenance burden on aerospace systems in austere environments, thus increasing durability/repairability of systems and keeping aircraft at forward bases for longer periods of time. - Re-initiate and accelerate activities to develop system fleet management decision-making tools, maintenance/repair database technologies and techniques, and supply chain/infrastructure approaches to reduce sustainment costs. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 funding increased compared to FY 2025 by \$7.347 million due to re-initiating and accelerating activities to demonstrate high reliability of repair and maintenance technologies to increase service time between maintenance actions, to develop materials and processes to reduce maintenance burden on aerospace systems in austere environments, and to develop				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603199F <i>I Sustainment Science and Technology (S&T)</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
system fleet management decision-making tools, maintenance/repair database technologies and techniques, and supply chain/infrastructure approaches to reduce sustainment costs.				
Title: Management/Improved Reliability Technologies Description: Develop, demonstrate, and transition technologies to improve existing and new components, fleet management/decision-making tools, and supply chain/sustainment infrastructure to decrease downtime and costs, and increase reliability. FY 2025 Plans: - Complete system development to provide prognostic capabilities for avionics components and analysis techniques to extend engine component service life. - Complete efforts to develop system fleet management decision-making tools, maintenance/repair database technologies and techniques, and supply chain/infrastructure approaches to reduce sustainment costs. These efforts span Department of the Air Force mission areas of Air, Space, and Cyber. FY 2026 Plans: Work completed in FY 2025. FY 2025 to FY 2026 Increase/Decrease Statement: Not applicable.		4.660	0.100	0.000
Accomplishments/Planned Programs Subtotals		9.710	5.668	12.915
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 2026 Air Force	Date: June 2025

Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>	PE 0603203F / <i>Advanced Aerospace Sensors</i>											
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
Total Program Element	0.000	51.051	37.935	69.652	0.000	69.652	-	-	-	-	-	-
63665A: <i>Advanced Aerospace Sensors Technology</i>	0.000	25.215	31.268	62.849	0.000	62.849	-	-	-	-	-	-
6369DF: <i>Target Attack and Recognition Technology</i>	0.000	25.836	6.667	6.803	0.000	6.803	-	-	-	-	-	-

Note

In FY 2026, the technical work and funding in Program 0603270F, Electronic Combat Technology; Project 633720, EW Quick Reaction Capabilities; Resilient Positioning, Navigation and Timing Effort is being integrated into Program 0603203F, Advanced Aerospace Sensors; Project 63665A, Advanced Aerospace Sensors Technology; Spectrum Dominance Technology Demonstrations Effort to facilitate integrated capability development.

In FY 2026, the technical work and funding in Program 0603270F, Electronic Combat Technology; Project 633720, EW Quick Reaction Capabilities; Integrated EW Demonstration Effort is being integrated into Program 0603203F, Advanced Aerospace Sensors; Project 63665A, Advanced Aerospace Sensors Technology; Spectrum Dominance Technology Demonstrations Effort to facilitate integrated capability development.

In FY2026, the technical work and funding in Program 0603270F, Electronic Combat Technology; Project 63431G, RF Warning & Countermeasures Tech; Spectrum Dominance Technology Demonstrations Effort is being integrated into Program 0603203F, Advanced Aerospace Sensors; Project 63665A, Advanced Aerospace Sensors Technology; Spectrum Dominance Technology Demonstrations Effort to facilitate integrated capability development.

A. Mission Description and Budget Item Justification

The Air Force Research Laboratory is focused on high-impact, multi-domain science & technology solutions that drive innovation now while laying the groundwork for the Air and Space Force to win the future fight. AFRL effectively synchronizes the Department of the Air Force science & technology enterprise and workforce to align towards the most consequential Department of the Air Force priorities and accelerate the delivery of game-changing science & technology.

This program develops and demonstrates technologies for electro-optical sensors, multifunction radio frequency sensors, precision navigation and timing, and electronic countermeasures, as well as associated technologies, critical components and algorithms to support Department of the Air Force surveillance, targeting, and electronic combat warfighting capabilities. The program develops and demonstrates technologies for integrating sensors, precision timing and navigation, and electronic combat sensors and systems into a fused and seamless technology capability to demonstrate capabilities for rapid fielding. This program creates and applies artificial intelligence toolsets to ensure an asymmetric advantage for the Department of the Air Force. The program demonstrates artificial intelligence enabled autonomy to augment cognitive capabilities of our Airmen and Guardians so they can keep up with the faster pace and increased complexity of modern warfare. This program has been coordinated through the Department of Defense Science and Technology Executive Committee process to harmonize efforts and eliminate duplication.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force				Date: June 2025		
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)		R-1 Program Element (Number/Name) PE 0603203F I Advanced Aerospace Sensors				
The Department of the Air Force technologies in this program are both enabling and enduring as we invest in maturing emerging technologies that address established mission gaps, and transformational technologies that address integrated enterprise capabilities intended to reshape the future force across warfighting domains. Development of transformational operational capabilities through advanced technology solutions focuses on five strategic capabilities: Global Persistent Awareness; Resilient Information Sharing; Rapid, Effective Decision-Making; Complexity, Unpredictability, and Mass; and Speed and Reach of Disruption and Lethality.						
In order to manage, execute, and deliver science and technology capabilities, this program element may include: necessary civilian pay expenses; expenses to support the operation and maintenance of facilities; as well as expenses related to travel, supplies, IT hardware, software and support, administrative contractor services, etc.						
This program is in Budget Activity 3, Advanced Technology Development because this budget activity includes development of subsystems and components and efforts to integrate subsystems and components into system prototypes for field experiments and/or tests in a simulated environment.						
B. Program Change Summary (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Previous President's Budget		48.046	37.935	32.605	0.000	32.605
Current President's Budget		51.051	37.935	69.652	0.000	69.652
Total Adjustments		3.005	0.000	37.047	0.000	37.047
• Congressional General Reductions		-7.200	0.000			
• Congressional Directed Reductions		0.000	0.000			
• Congressional Rescissions		0.000	0.000			
• Congressional Adds		5.000	0.000			
• Congressional Directed Transfers		0.000	0.000			
• Reprogrammings		8.504	0.000			
• SBIR/STTR Transfer		-1.377	0.000			
• Other Adjustments		-1.922	0.000	37.047	0.000	37.047
Congressional Add Details (\$ in Millions, and Includes General Reductions)						
Project: 63665A: Advanced Aerospace Sensors Technology						
Congressional Add: Program increase: Airborne early warning pod digital radar technology						
Congressional Add Subtotals for Project: 63665A						
Congressional Add Totals for all Projects						
Change Summary Explanation						
In FY 2024, decrease of \$1.922 million in Other Adjustments was due to realignment of funds to PE 0602212F, Defense Laboratories R&D Projects, to implement the Department of Defense (DoD) Funding Laboratory Enhancements Across Four Categories (FLEX-4) authority under 10 U.S.C Section 4123.						

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	
3600: Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)	PE 0603203F I Advanced Aerospace Sensors	
The FY 2026 budget request increased by a net of \$37.047 million due to programmatic adjustments within the Science and Technology portfolio. The net increase is primarily driven by the transfer of funding and technical work from Program Element 0603270F, Electronic Combat Technology. Details of the adjustments are as follows: -- In FY 2026, the budget increased by \$37.374 million due to the transfer of all funding and technical work from Program Element 0603270F, Electronic Combat Technology, to Program Element 0603203F, Advance Aerospace Sensors, to facilitate integrated capability development. -- The FY 2026 request was reduced by \$0.115 million for Advisory and Assistance Services to promote efficiencies and advance the policies of the Administration in alignment with Executive Order 14222, "Implementing the President's Department of Government Efficiency Cost Efficiency Initiative." -- FY 2026 decreased compared to FY 2025 by \$0.212 million due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency.		

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 3					R-1 Program Element (Number/Name) PE 0603203F / Advanced Aerospace Sensors				Project (Number/Name) 63665A / Advanced Aerospace Sensors Technology			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
63665A: Advanced Aerospace Sensors Technology	0.000	25.215	31.268	62.849	0.000	62.849	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2026, the technical work and funding in Program 0603270F, Electronic Combat Technology; Project 633720, EW Quick Reaction Capabilities; Resilient Positioning, Navigation and Timing Effort is being integrated into Program 0603203F, Advanced Aerospace Sensors; Project 63665A, Advanced Aerospace Sensors Technology; Spectrum Dominance Technology Demonstrations Effort.

In FY 2026, the technical work and funding in Program 0603270F, Electronic Combat Technology; Project 633720, EW Quick Reaction Capabilities; Integrated EW Demonstration Effort is being integrated into Program 0603203F, Advanced Aerospace Sensors; Project 63665A, Advanced Aerospace Sensors Technology; Spectrum Dominance Technology Demonstrations Effort.

In FY2026, the technical work and funding in Program 0603270F, Electronic Combat Technology; Project 63431G, RF Warning & Countermeasures Tech; Spectrum Dominance Technology Demonstrations Effort is being integrated into Program 0603203F, Advanced Aerospace Sensors; Project 63665A, Advanced Aerospace Sensors Technology, Spectrum Dominance Technology Demonstrations Effort.

A. Mission Description and Budget Item Justification

This project develops and demonstrates aerospace sensor and processing technologies, electronic warfare equipment, and precision navigation and timing systems for intelligence, surveillance, reconnaissance, target, and attack radar applications in both crewed and uncrewed platforms, including electro-optical sensors and electronic counter-countermeasures for radars. It provides aerospace platforms with the capability to precisely detect, track, and target both airborne (conventional and low radar cross-section) and ground-based, high-value, time-critical targets in adverse clutter and jamming environments. Project activities include developing multi-function and multi-domain radio frequency and electro-optical systems including radar and electronic warfare technology and the position and timing information to enable distributed sensing. Desired warfighting capabilities include the ability to detect concealed targets in difficult background conditions.

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

	FY 2024	FY 2025	FY 2026
Title: Multi-Spectrum Sensing Demonstration	11.116	10.995	0.000
Description: Develop and demonstrate new techniques for finding and identifying critical mobile targets (both land and maritime) in a highly contested environment. Bring together multi-domain electro-optical/infrared and radio frequency technologies suitable for the contested environment, in conjunction with advanced processing and algorithms to provide for decision-making at the edge. Multiple sensing modalities may be deployed on the same platform or on separate platforms to improve survivability and flexibility. A focus is on providing actionable information to a user deciding on future actions, such as strike. The effort will conduct			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603203F / <i>Advanced Aerospace Sensors</i>	Project (Number/Name) 63665A / <i>Advanced Aerospace Sensors Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
a robust demonstration showing how the techniques enable combat operations, emphasizing resilience and tactically-relevant persistence.			
FY 2025 Plans: - Continue to refine employment concepts for penetrating intelligence, surveillance and reconnaissance, and strike to bound platforms along with their costs and available payloads. - Continue development of electro-optical/infrared sensors and algorithms balancing performance with cost, size, weight, and power. - Continue development and packaging of an attritable laser radar sensor based on prior multi-mode laser radar work. - Continue development of radio frequency sensors and techniques. - Continue to refine experiments that will demonstrate multi-phenomenology sensor capability. - Continue to refine distributed radio frequency techniques. - Continue sensor upgrades that bring them into compliance with Department of Defense and Department of Air Force open interface standards. - Continue open standard compliance verification effort through use of hardware/software integration labs. - Continue to leverage prior work on sensor fusion to initiate a focused effort on fusion in support of command and control to engage surface (ground and maritime) targets. FY 2026 Plans: In FY 2026 the funding and technical activities from this effort were realigned to Program Element 0603203F, Advanced Aerospace Sensors, Project 63665A, Advanced Aerospace Sensors Technology, ISR and Targeting of Surface Threats effort. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$10.995 million due to the realignment of funding and technical activities from this project to Program Element 0603203F, Advanced Aerospace Sensors, Project 63665A, Advanced Aerospace Sensors Technology, ISR and Targeting of Surface Threats Effort.			
Title: ISR and Targeting of Surface Targets		9.099	10.851
Description: This effort will develop and demonstrate new technologies and techniques for finding, identifying, and maintaining custody of critical, high-value targets (both land and maritime). It provides real-time multi-domain battlespace awareness technologies for future capabilities. Emphasis will be placed on the demands of a highly contested environment. However, the challenges presented by long-distance operations and theater-wide combat operations will also be addressed. Research and development will bring together multi-domain, cross-platform electro-optical/infrared, radio frequency, spectrum dominance, and positioning, navigation and timing technologies suitable for the highly contested environment in conjunction with advanced processing and algorithms to provide for decision-making at the edge as well as to support more conventional intelligence,			24.498

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 3		R-1 Program Element (Number/Name) PE 0603203F / Advanced Aerospace Sensors		Project (Number/Name) 63665A / Advanced Aerospace Sensors Technology	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
surveillance, reconnaissance, command and control decision making, and spectrum dominance capabilities. Multiple sensing modalities may be deployed on the same platform or on separate platforms to improve effectiveness, robustness, survivability, and flexibility. Fusion of information from multiple sources with on-board and local sensors to provide higher fidelity battlespace awareness information. Technologies needed for automated and autonomous operations will be developed and applied as appropriate. An important focus of this activity is on providing actionable information to decision makers as part of the Sensing Grid concept to feed the Joint All Domain Command and Control capability. The effort will conduct robust demonstrations showing how the techniques enable combat operations, emphasizing resilience, and tactically relevant persistence. In FY 2026, the funding and technical activities from Program 0603203F, Advanced Aerospace Sensors; Project 63665A, Advanced Aerospace Sensors Technology; Multi-Spectrum Sensing Demonstration Effort was aligned to this effort. In FY 2026 Surface Targets Sense-Making was renamed ISR and Targeting of Surface Targets. FY 2025 Plans: - Continue assessment and selection of surface sensing and sense-making capabilities of multi-modal surface target classification as appropriate, based on knowledge gained in the previous year. - Continue selection of sensing autonomy capabilities enabling multi-modal and distributed sensor resource management for optimized tracking and identification of high value surface targets. - Continue expansion of Modeling, Simulation, and Analysis products to represent the maritime scenario of current interest enabling the necessary assessment of system design trades. - Continue to capture knowledge and design information using Model Based System Engineering. - Continue algorithm development of mission autonomy solutions as appropriate enabling the orchestration of unmanned airborne systems for ISR support to maintain custody of critical maritime targets. - Continue development of advanced analytics to forecast the behavior of surface targets. - Continue software and hardware integration and test in the Systems Integration Laboratory/Hardware Integration Laboratory. - Continue investigation into existing interfaces with off-board systems connected to Joint All Domain Command and Control enterprise by focusing attention on the sharing of relevant Multi-Intelligence/Multi-Domain data sources in both directions. - Continue development of multi-platform Live, Virtual, and Constructive testing and operational experimentation. - Continue transition analysis, planning and documentation of the overall system to a relevant partner. FY 2026 Plans: - Continue assessment and selection of surface sensing and sense-making capabilities of multi-modal surface target classification as appropriate, based on operationally relevant signatures, warfighter input, sensing phenomenology, and previously acquired knowledge. Based on available information and warfighter needs, develop sensing technology (hardware and software).					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603203F / <i>Advanced Aerospace Sensors</i>	Project (Number/Name) 63665A / <i>Advanced Aerospace Sensors Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Continue algorithm development of mission autonomy solutions as appropriate enabling the orchestration of unmanned airborne systems for intelligence, surveillance and reconnaissance support to maintain custody of critical surface targets with emphasis on the maritime environment. This includes the development of advanced analytics to forecast the behavior of operationally relevant surface targets. - Continue development of advanced analytics to forecast the behavior of surface targets. - Continue software and hardware integration and test in the Systems Integration Laboratory/Hardware Integration Laboratory. - Continue development of multi-platform Live, Virtual, and Constructive testing and operational experimentation in relevant environments. - Continue expansion of Modeling, Simulation, and Analysis products to represent the maritime scenario of current interest enabling the necessary assessment of system design trades. - Continue to capture knowledge and design information using Model Based System Engineering. - Initiate hardware and software refinement to instantiate novel multi-modal, multi-platform sensing capabilities that meet identified needs. During development, balance performance with cost, size, weight, power, and cooling. Assess impact of these platform-imposed restrictions on the sensing's ability to perform in a highly contested environment. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$13.647 million due to the realignment of funding and technical activities from Program Element 0603203F, Advanced Aerospace Sensors, Project 63665A, Advanced Aerospace Sensors Technology, Multi-Spectrum Sensing Demonstration Effort, into this effort.			
Title: Integrated Sensing Demonstration Description: Integrate emerging technologies to demonstrate enhanced forward air-layer air base defense capabilities. Goal is to improve surveillance, shorten reaction time, and to apply a range of effects at precise points to provide early warning and enable defensive measures. FY 2025 funding for the technical work for this effort was realigned from Program Element 0603203F, Advanced Aerospace Sensors, Project 6369DF, Target Attack and Recognition Technology, Integrated Sensing Demonstration effort. FY 2025 Plans: - Continue integration of chosen technologies onto demonstration platform. - Initiate experiments to characterize integrated technologies. - Continue use of mission level modeling and model-based systems engineering to provide quantifiable data to drive towards solution sets that provide leading capabilities. FY 2026 Plans:		0.000	9.422
			0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 3		R-1 Program Element (Number/Name) PE 0603203F / <i>Advanced Aerospace Sensors</i>	Project (Number/Name) 63665A / <i>Advanced Aerospace Sensors Technology</i>		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
In FY 2026 the funding and technical activities from this effort were realigned to Program Element 0603203F, Advanced Aerospace Sensors, Project 63665A, Advanced Aerospace Sensors Technology, ISR and Targeting of Airborne Threats Effort.					
FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$9.422 million due to the realignment of funding and technical activities from this project to Program Element 0603203F, Advanced Aerospace Sensors, Project 63665A, Advanced Aerospace Sensors Technology, ISR and Targeting of Airborne Threats Effort.					
Title: ISR and Targeting of Airborne Threats Description: Develop and demonstrate integrated electro-optical, radio frequency, electronic warfare, and precision navigation and timing systems along with advanced processing and algorithms to enhance Department of the Air Force kill chain operations. In FY 2026, the funding and technical activities from Program 0603203F, Advanced Aerospace Sensors; Project 63665A, Advanced Aerospace Sensors Technology; Integrated Sensing Demonstration Effort was aligned to this effort. FY 2025 Plans: Not Applicable FY 2026 Plans: - Initiate development of modes to be used on open architecture digital radio frequency arrays for future Air Force systems. - Initiate work on a synthetic test environment for testing digital radio frequency modes virtually without the need to conduct expensive flight testing. - Initiate development of mission systems for autonomous collaborative platforms including radio frequency arrays and algorithms, electro-optical systems, and the necessary precision navigation and timing equipment to enable and optimize blue kill chains. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$4.951 million due to the realignment of funding and technical activities from Program Element 0603203F, Advanced Aerospace Sensors, Project 63665A, Advanced Aerospace Sensors Technology, Integrated Sensing Demonstration Effort, into this effort.			0.000	0.000	4.951
Title: Spectrum Dominance Technology Demonstrations Description: Integrate emerging technologies to develop and demonstrate electromagnetic warfare spectrum dominance concepts, technologies, and techniques. Goal is to counter advanced complex electromagnetic threats in contested environments across radio frequency and electro-optic/infrared spectrums. The effort also develops and transitions robust Global Navigation Satellite System capabilities; resilient complementary position, navigation, and timing techniques; precise position, navigation, and timing technologies for distributed sensing/effects; position, navigation, and timing technology to provide position, navigation, and			0.000	0.000	33.400

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603203F / <i>Advanced Aerospace Sensors</i>	Project (Number/Name) 63665A / <i>Advanced Aerospace Sensors Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
timing electronic warfare situational awareness and training; and position, navigation, and timing architectures to enable resiliency against the rapidly evolving threat. Efforts will include prototypes and relevant Open Architecture standards where applicable to enable timely technology transition. FY 2026 increased compared to FY 2025 by \$33.403 million due to the realignment of funding and technical activities from the following efforts into this effort. - Program Element 0603270F, Electronic Combat Technology; Project 633720, Quick Reaction Capabilities; Resilient Positioning, Navigation and Timing Effort. - Program Element 0603270F, Electronic Combat Technology; Project 633720, Quick Reaction Capabilities; Integrated EW Demonstration Effort. - Program Element 0603270F, Electronic Combat Technology; Project 63431G RF Warning & Countermeasures Tech; Spectrum Dominance Technology Demonstrations Effort. FY 2025 Plans: Not Applicable. FY 2026 Plans: - Initiate development and maturation of cognitive electromagnetic warfare technologies to provide enhanced survivability within a complex electromagnetic operating environment; prototype advanced data analytics capabilities to assist human operators with planning, re-tasking, and assessing non-kinetic effects against a highly dynamic adversary kill web. - Continue maturing effort to develop and assess multi-spectral electromagnetic support and attack concepts and technologies against emerging threats, leveraging successful completion of Radio Frequency Electronic Warfare Demonstrator effort; Develop a 'pipeline' to leverage modern industry software practices to rapidly transition electronic warfare algorithms (The EW Pipeline). - Continue assessing operational and program office requirements to determine multi-spectral shortfalls and determine applicable modeling & simulation to evaluate shortfalls and potential technologies to address these shortfalls. - Complete multi-spectral development within Reference Architecture Implementations and open architectures standards to support enhanced modeling, simulation and assessment. - Continue conducting both field technology demonstrations and continuous integration events, and analysis from the demonstrations to support transition into Air Force platforms and electromagnetic spectrum operations units. - Continue threat characterization, countermeasures development, and field testing of laser jam codes and techniques against new advanced threats. - Continue effectiveness assessment of laser and missile warning technologies and techniques for a variety of Air Force platforms.			
		FY 2026	

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 3		R-1 Program Element (Number/Name) PE 0603203F / <i>Advanced Aerospace Sensors</i>		Project (Number/Name) 63665A / <i>Advanced Aerospace Sensors Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
- Complete development of advanced networking, processing, advanced computing paradigms, and cybersecurity technologies for next-generation avionics mission system capabilities. - Continue utilizing agile development processes and digital engineering techniques to further accelerate development, integration, and demonstrations to rapidly respond to new and unexpected complex emitters in realistic electromagnetic operating environments. - Continue development of technologies to establish and maintain resilient and robust positioning, navigation, and timing capabilities for airborne platforms in various environments, including over vast spans of water. - Continue to integrate these technologies into the reference implementations aligned with the resilient embedded global positioning system-inertial and positioning, navigation and timing software defined user equipment programs of record. - Continue developing, demonstrating, and promulgating navigational open architecture standards to permit integration of alternative position, navigation and timing approaches into future Department of Defense systems. <i>FY 2025 to FY 2026 Increase/Decrease Statement:</i> FY 2026 increased compared to FY 2025 by \$33.400 million due to the realignment of funding and technical activities from the following efforts into this effort. - Program Element 0603270F, Electronic Combat Technology; Project 633720, Quick Reaction Capabilities; Resilient Positioning, Navigation and Timing Effort. - Program Element 0603270F, Electronic Combat Technology; Project 633720, Quick Reaction Capabilities; Integrated EW Demonstration Effort. - Program Element 0603270F, Electronic Combat Technology; Project 63431G RF Warning & Countermeasures Tech; Spectrum Dominance Technology Demonstrations Effort.					
Accomplishments/Planned Programs Subtotals			20.215	31.268	62.849
			FY 2024	FY 2025	
<i>Congressional Add:</i> Program increase: Airborne early warning pod digital radar technology			5.000	0.000	
<i>FY 2024 Accomplishments:</i> Conduct Congressional directed efforts					
<i>FY 2025 Plans:</i> Not Applicable					
Congressional Adds Subtotals			5.000	0.000	
C. Other Program Funding Summary (\$ in Millions)					
N/A					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603203F / Advanced Aerospace Sensors	Project (Number/Name) 63665A / Advanced Aerospace Sensors Technology
C. Other Program Funding Summary (\$ in Millions)		
Remarks		
D. Acquisition Strategy		
Not applicable		

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 3					R-1 Program Element (Number/Name) PE 0603203F / Advanced Aerospace Sensors				Project (Number/Name) 6369DF / Target Attack and Recognition Technology			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
6369DF: Target Attack and Recognition Technology	0.000	25.836	6.667	6.803	0.000	6.803	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project area develops and demonstrates advanced technologies for closed-loop, multi-domain, multi-intelligence sources, multi-platform, multi-sensor automation and autonomy, providing capabilities in battle management, fire control, battlespace awareness and visualization, predictive analytics, target recognition, sensor and information fusion, and sensor / platform asset tasking. This project also conducts advanced investigations to determine solution credibility, in terms of underlying technology and in terms of consistency with future Department of the Air Force missions within highly contested environments. This project includes robust techniques to support intelligence, surveillance, and reconnaissance and targeting missions within adverse weather conditions and against adversaries employing deceptive techniques. This project includes development of software-intensive solutions suitable for cloud-based integration and for development/operations-like operational environments. This project develops technology for effective management of online and offline information sources incorporating both constrained and cooperative sensing. This project has been realigned to better reflect technical areas being emphasized such as autonomy, multi-domain and multi-sensor information processing, leverage of machine learning developments and enterprise-level modeling, simulation, and analysis.

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

	FY 2024	FY 2025	FY 2026
Title: Integrated Sensing Demonstration Description: Integrate emerging technologies to demonstrate enhanced forward air-layer air base defense capabilities. Goal is to improve surveillance, shorten reaction time, and to apply a range of effects at precise points to provide early warning and enable defensive measures. FY 2025 Plans: In FY 2025, this effort was realigned to Program Element 0603203F, Advanced Aerospace Sensors, Project 63665A, Advanced Aerospace Sensors Technology, Integrated Sensing Demonstration effort. FY 2026 Plans: Not Applicable FY 2025 to FY 2026 Increase/Decrease Statement: Not Applicable	10.897	0.000	0.000
Title: Autonomous Capability for Air Defense Description: Design, develop, and demonstrate an artificial intelligence tactical autopilot engaging in multi-ship/multi-role beyond visual range and intelligence, surveillance, and reconnaissance combat operations with proficiency at or greater than Weapons	14.939	6.667	6.803

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 3		R-1 Program Element (Number/Name) PE 0603203F / <i>Advanced Aerospace Sensors</i>		Project (Number/Name) 6369DF / <i>Target Attack and Recognition Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
School graduates. Design, develop, and demonstrate an artificial intelligence-driven multi-platform/multi-domain sense-making, predictive analytics, and orchestration at the tactical edge to track/identify air and ground targets. Design, develop, and integrate safe autonomy tools for multi-satellite teaming operations. Integrates safety assurances at run-time with advanced artificial intelligence/machine learning tools incorporating operator preferences and interfacing to enable catered and efficient planning to the next generation of operators. Develop, integrate, and demonstrate dynamic command/control of tanking operations. Optimize air refueling operations and plan for contingencies. FY 2025 Plans: - Continue demonstration of edge sensing assets cued via centralized intelligence data on air threats to support evaluation of performance via life flight tests. - Continue both evaluation and advancement of solution options for on board fusion and predictive analytics to inform orchestration of attritable platforms into areas of interest. - Continue testing and evaluation of multi-platform resource managers to position assets for optimal sensing geometries. - Continue development of advanced autonomy algorithms using modern machine learning tools that control the aircraft, sensors, and weapons onboard manned and/or unmanned aircraft and perform operationally relevant combat tactics. FY 2026 Plans: - Continue demonstration of edge sensing assets cued via centralized intelligence data on air threats to support evaluation of performance via life flight tests. - Continue both evaluation and advancement of solution options for on board fusion and predictive analytics to inform orchestration of attritable platforms into areas of interest. - Continue testing and evaluation of multi-platform resource managers to position assets for optimal sensing geometries. - Continue development of advanced autonomy algorithms using modern machine learning tools that control the aircraft, sensors, and weapons onboard manned and/or unmanned aircraft and perform operationally relevant combat tactics. - Initiate the development of an integrated suite of capabilities for information seeking and information retrieval. - Initiate the implementation of varying artificial intelligence approaches, including newer large language models and retrieval-augmented generative models. - Initiate applied artificial intelligence research for near-term human performance applications. - Initiate neuroscience and psychology frameworks to enhance artificial intelligence engineering and technology development. - Initiate the creation of common representation languages to improve alignment, trust, and situational awareness in crewed and uncrewed teams. FY 2025 to FY 2026 Increase/Decrease Statement:					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603203F / Advanced Aerospace Sensors	Project (Number/Name) 6369DF / Target Attack and Recognition Technology		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
FY 2026 increased compared to FY 2025 by \$0.167 million due to inflation.				
Accomplishments/Planned Programs Subtotals		25.836	6.667	6.803
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
Not applicable				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force	Date: June 2025

Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
3600: Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)					PE 0603211F I Aerospace Technology Dev/Demo							
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
Total Program Element	0.000	131.596	91.719	102.125	0.000	102.125	-	-	-	-	-	-
634093: Missile Rocket Propulsion Integ & Demo	0.000	0.000	10.079	5.662	0.000	5.662	-	-	-	-	-	-
634094: Next Gen Platform Dev/Demo	0.000	88.628	0.000	0.000	0.000	0.000	-	-	-	-	-	-
634920: Flight Vehicle Tech Integration	0.000	12.337	26.807	12.221	0.000	12.221	-	-	-	-	-	-
634921: Aircraft Propulsion Subsystems Int	0.000	0.000	20.200	19.952	0.000	19.952	-	-	-	-	-	-
634926: High Speed Systems Integ & Demo	0.000	12.909	23.715	47.378	0.000	47.378	-	-	-	-	-	-
634927: Flight Systems Control	0.000	17.722	10.918	16.912	0.000	16.912	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This program supports Department of Defense (DoD) priorities for Aerospace Systems demonstrations to include high-speed systems and autonomous collaborative platforms. System level integration and demonstration of advanced aerospace system technologies (autonomy, propulsion, power and thermal, air vehicle, fuels, etc.) in a near-realistic operational environment enhance performance and supportability of existing and future aerospace systems while reducing the risk and time required to transition technologies into operational aircraft. Additionally, this program supports the nuclear enterprise and nuclear deterrence through advanced component and technology demonstrations. Projects in this program have been coordinated through the DoD Science and Technology (S&T) Executive Committee process to harmonize efforts and eliminate duplication.

The program has six current projects, each focusing on technologies with a high potential to enhance the performance of existing and future Air Force weapon systems via modeling, simulation, and analysis while utilizing digital engineering to accelerate and enhance the S&T development.

- Missile Rocket Propulsion Integration and Demonstration: Develops and demonstrates innovative rocket propulsion technologies, propellants, and manufacturing techniques for strategic and tactical systems to reduce costs, schedule, and increase performance.
- Next Gen Platform Dev/Demo: Supports the nuclear enterprise and nuclear deterrence through advanced component and technology demonstrations.
- Flight Vehicle Tech Integration: Develops and demonstrates aerospace vehicle technology to enhance the capability of current and future aerospace systems with current focus on autonomous collaborative platform capabilities.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)	R-1 Program Element (Number/Name) PE 0603211F I Aerospace Technology Dev/Demo	
- Aircraft Propulsion Subsystems Integration: Develops and demonstrates propulsion technology to increase warfighting capability by advancing engine operational reliability and durability, providing mission flexibility, and improved performance while reducing weight, fuel consumption, and cost of ownership. - High-Speed Systems Integration and Demonstration: Develops, demonstrates, and integrates high-speed propulsion capability (to include hypersonic) propulsion, vehicle, and subsystems to enhance and enable high-speed system technology, increasing long range strike capabilities at the speed of critical warfighting capabilities required for near peer competition. - Flight Systems Control: Develops and demonstrates adaptive power and thermal management components, controls and systems for high-power payloads enabling aerospace systems to deliver strike capabilities while integrating autonomy and control technologies to enable affordable mass in the fight and revolutionary autonomous collaborative platform capabilities. In FY 2025, the RDT&E Budget Activity 03 (BA03) Aerospace Propulsion and Power Technology efforts and activities under PE 0603216F, were transferred to PE 0603211F, Aerospace Technology Dev/Demo for increased integration between airframe, flight control, propulsion, electrical, power and thermal management. In FY 2025, the entirety of PE 0603216F, Aerospace Propulsion and Power Technology, Project 633035 Aerospace Power Technology, was transferred to PE 0603211F, Aerospace Technology Dev/Demo, Project 634927 Flight Systems Control. In FY 2025, the entirety of PE 0603216F, Aerospace Propulsion and Power Technology, Project 634093 Missile Rocket Propulsion Integ & Demo, was transferred to PE 0603211F, Aerospace Technology Dev/Demo, Project 634093 Missile Rocket Propulsion Integ & Demo. In FY 2025, the entirety of PE 0603216F, Aerospace Propulsion and Power Technology, Project 634921 Aircraft Propulsion Subsystems Int, was transferred to PE 0603211F, Aerospace Technology Dev/Demo, Project 634921 Aircraft Propulsion Subsystems Int. In FY 2025, the entirety of PE 0603216F, Aerospace Propulsion and Power Technology, Project 635098 Advanced Aerospace Propulsion, was transferred to PE 0603211F, Aerospace Technology Dev/Demo, Project 634926 High-Speed Systems Integ & Demo. Efforts in this program have been coordinated through the Department of Defense (DoD) Science and Technology (S&T) Executive Committee process to harmonize efforts and eliminate duplication. This program element may include necessary civilian pay expenses required to manage, execute, and deliver science & technology (S&T) capabilities. The use of program funds in this program element would be in addition to the civilian pay expenses budgeted in program elements 0601102F, 0602020, 0602102F, 0602202F,0602203F, 0602204F, 0602602F, 0602605F, 0602788F, 0602298F, and 1206601SF. This program element may include necessary expenses to support the operation and maintenance of facilities to manage, execute, and deliver science and technology (S&T) capabilities.		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force			Date: June 2025			
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)		R-1 Program Element (Number/Name) PE 0603211F I Aerospace Technology Dev/Demo				
The FY 2026 request was reduced by \$0.240 million for Advisory and Assistance Services to promote efficiencies and advance the policies of the Administration in alignment with Executive Order 14222, "Implementing the President's Department of Government Efficiency Cost Efficiency Initiative."						
This program is in Budget Activity 3, Advanced Technology Development because this budget activity includes development of subsystems and components and efforts to integrate subsystems and components into system prototypes for field experiments and/or tests in a simulated environment.						
B. Program Change Summary (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Previous President's Budget		51.896	102.529	113.400	0.000	113.400
Current President's Budget		131.596	91.719	102.125	0.000	102.125
Total Adjustments		79.700	-10.810	-11.275	0.000	-11.275
• Congressional General Reductions		0.000	0.000			
• Congressional Directed Reductions		0.000	-24.810			
• Congressional Rescissions		0.000	0.000			
• Congressional Adds		86.857	14.000			
• Congressional Directed Transfers		0.000	0.000			
• Reprogrammings		0.000	0.000			
• SBIR/STTR Transfer		-5.081	0.000			
• Other Adjustments		-2.076	0.000	-11.275	0.000	-11.275
Congressional Add Details (\$ in Millions, and Includes General Reductions)						
Project: 634093: Missile Rocket Propulsion Integ & Demo						
Congressional Add: Layered Tanks						
Congressional Add Subtotals for Project: 634093						
Project: 634094: Next Gen Platform Dev/Demo						
Congressional Add: Program Increase - Digital Engineering Test Bed						
Congressional Add: Program Increase - Hybrid Electric Propulsion						
Congressional Add: Program Increase - Autonomous Air to Air Refueling						
Congressional Add: Program Increase - Long Duration, Broad-Area, Multi-Sensor Capability						
Congressional Add: Low-Profile Laser Beam Director for High Speed Aircraft						
Congressional Add: Alternative PNT for Hypersonics						
Congressional Add: Reentry Systems Test Bed						

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603211F / <i>Aerospace Technology Dev/Demo</i>	
<u>Congressional Add Details (\$ in Millions, and Includes General Reductions)</u>		FY 2024	FY 2025
Congressional Add Subtotals for Project: 634094		83.454	-
Project: 634920: <i>Flight Vehicle Tech Integration</i>			
Congressional Add: <i>Program increase - digital thread capabilities</i>		-	10.000
Congressional Add Subtotals for Project: 634920		-	10.000
Project: 634927: <i>Flight Systems Control</i>			
Congressional Add: <i>Program increase - bonded unitized composites large scale structural demonstration</i>		9.634	-
Congressional Add Subtotals for Project: 634927		9.634	-
Congressional Add Totals for all Projects		93.088	14.000
<u>Change Summary Explanation</u> The FY 2026 \$12.000 million Other Adjustment decrease is due to the transfer of drag reduction activities to the Operational Energy PE, 06044860, to provide appropriate funds for planned efforts.			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 3					R-1 Program Element (Number/Name) PE 0603211F / Aerospace Technology Dev /Demo				Project (Number/Name) 634093 / Missile Rocket Propulsion Integ & Demo			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
634093: Missile Rocket Propulsion Integ & Demo	0.000	0.000	10.079	5.662	0.000	5.662	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops and demonstrates technologies for strategic systems (including solid rocket motor boosters, post boost control, and aging and surveillance efforts) and tactical rockets. Characteristics such as environmental acceptability, affordability, manufacturability, reliability, responsiveness, reduced weight, and reduced operation and launch costs are emphasized. Rapid design, characterization, demonstration, and rapid manufacturing are key goals while ensuring increased life and performance. Technology areas investigated include ground demonstrations of compact, lightweight, advanced propulsion technologies and high-energy propellants.

This project demonstrates next generation of physics-based modeling, simulation, and analysis (MS&A) tools for rapid and agile missile propulsion design, analysis, and production, as well as the digital engineering concepts to manage the entire process of design, test, and validation of solid rocket motors. The efforts in this project contribute to the sustainment of the rocket propulsion industry, providing rocket propulsion technology for the Department of Defense (DoD). The efforts in this project are reviewed by a DoD level steering committee annually for relevance to DoD missions.

In FY 2025, the entirety of PE 0603216F, Aerospace Propulsion and Power Technology, Project 634093 Missile Rocket Propulsion Integ & Demo, was transferred to PE 0603211F, Aerospace Technology Dev/Demo, Project 634093 Missile Rocket Propulsion Integ & Demo.

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

	FY 2024	FY 2025	FY 2026
Title: Missile Propulsion Integration and Demonstration	0.000	6.079	5.662
Description: Advance the development of cutting-edge missile propulsion systems for ballistic and tactical missiles, with a focus on integrating and demonstrating solid rocket motor technology for next-generation, rapidly deployable platforms. By leveraging digital design, testing, and innovative manufacturing techniques, this research aims to enhance the performance, effectiveness, and production capabilities of missile propulsion systems, ultimately supporting the nation's defense requirements and strengthening its industrial manufacturing base.			
FY 2026 Change - effort Missile Propulsion Technologies is retitled Missile Propulsion Integration and Demonstration.			
FY 2025 Plans: - Continue development and test of solid rocket motors relevant to defense needs such as large air-launched boosters for high-speed weapon application.			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603211F / Aerospace Technology Dev /Demo	Project (Number/Name) 634093 / Missile Rocket Propulsion Integ & Demo	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Continue to design and develop modeling and simulation tools that more fully describe the physical processes that occur during manufacture and/or operation, and that reduce predictive uncertainty in design and analysis. - Continue development of advanced manufacturing processes for solid rocket motors including inert components, energetic components, fabrication systems and automated assembly operations. FY 2026 Plans: -Continue development and test of solid rocket motors relevant to defense needs for rapid and agile manufacturing for propulsion capability for high performance tactical demonstration for missiles and rockets. -Activities include flight tests of motors developed through additive manufacturing methods. -Continue to design and develop modeling and simulation tools that more fully describe the physical processes that occur during manufacture and/or operation, and that reduce predictive uncertainty in design and analysis. -Activities include finalizing codes and developments for a digital engineering architecture. -Continue development of advanced manufacturing processes for solid rocket motors including inert components, energetic components, fabrication systems and automated assembly operations. -Activities include completing local solid rocket motor manufacturing pilot plant laboratory. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$0.417 million due to completion of system design.			
Accomplishments/Planned Programs Subtotals		0.000	6.079
		FY 2024	FY 2025
Congressional Add: Layered Tanks		0.000	4.000
FY 2024 Accomplishments: Conduct Congressionally directed effort. This effort will be executed in Program 0603211F, Aerospace Technology Dev/Demo, Project 634093, Missile Rocket Propulsion Integ & Demo.			
FY 2025 Plans: Conduct Congressionally directed effort.			
Congressional Adds Subtotals		0.000	4.000
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603211F / Aerospace Technology Dev /Demo	Project (Number/Name) 634093 / Missile Rocket Propulsion Integ & Demo
D. Acquisition Strategy Not Applicable.		

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 3					R-1 Program Element (Number/Name) PE 0603211F / Aerospace Technology Dev /Demo				Project (Number/Name) 634094 / Next Gen Platform Dev/Demo			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
634094: Next Gen Platform Dev/ Demo	0.000	88.628	0.000	0.000	0.000	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
This project demonstrates advanced nuclear-related components and technologies in support of the nuclear enterprise and nuclear deterrence operations missions. Next Gen Platform Development/Demonstration efforts are accomplished through development, integration, testing, and evaluation of various technologies to include fuzes, aeroshells, inertial guidance, and nuclear-specific communications for demonstration in near-realistic operational environments.												
This Project and associated efforts will continue to be executed by the Air Force Research Laboratory Space Vehicles Technology Directorate located in Kirtland Air Force Base, New Mexico.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2024	FY 2025	FY 2026	
Title: Advanced Nuclear Components									5.174	0.000	0.000	
Description: Develop next-generation solid state, radiation-hardened strategic advance inertial system components for hostile environment.												
FY 2025 Plans: Not Applicable												
FY 2026 Plans: Not Applicable												
FY 2025 to FY 2026 Increase/Decrease Statement: Not Applicable												
Accomplishments/Planned Programs Subtotals									5.174	0.000	0.000	
							FY 2024	FY 2025				
Congressional Add: Program Increase - Digital Engineering Test Bed							9.634	-				
FY 2024 Accomplishments: Conduct Congressionally directed efforts.												
Congressional Add: Program Increase - Hybrid Electric Propulsion							28.902	-				

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force								Date: June 2025			
Appropriation/Budget Activity 3600 / 3				R-1 Program Element (Number/Name) PE 0603211F / <i>Aerospace Technology Dev /Demo</i>				Project (Number/Name) 634094 / <i>Next Gen Platform Dev/Demo</i>			
								FY 2024	FY 2025		
FY 2024 Accomplishments: Conduct Congressionally directed efforts.											
Congressional Add: Program Increase - Autonomous Air to Air Refueling								1.926	-		
FY 2024 Accomplishments: Conduct Congressionally directed efforts.											
Congressional Add: Program Increase - Long Duration, Broad-Area, Multi-Sensor Capability								27.097	-		
FY 2024 Accomplishments: Conduct Congressionally directed efforts.											
Congressional Add: Low-Profile Laser Beam Director for High Speed Aircraft								1.926	-		
FY 2024 Accomplishments: Conduct Congressionally directed efforts.											
Congressional Add: Alternative PNT for Hypersonics								9.152	-		
FY 2024 Accomplishments: Conduct Congressionally directed efforts.											
Congressional Add: Reentry Systems Test Bed								4.817	-		
FY 2024 Accomplishments: Conduct Congressionally directed efforts.											
Congressional Adds Subtotals								83.454	-		
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
• RDTE 03 0603273F: <i>Science & Technology for Nuclear Re-entry Systems</i>	65.088	91.885	128.407	-	128.407	-	-	-	-	-	-
• RDTE 02 0602201F: <i>Aerospace Vehicle Technologies</i>	12.922	15.235	0.000	-	0.000	-	-	-	-	-	-
• RDTE 02 0602336F: <i>Nuclear Delivery Systems Tech Exploration</i>	0.000	0.000	4.969	-	4.969	-	-	-	-	-	-
Remarks											
D. Acquisition Strategy											
Not applicable											

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 3					R-1 Program Element (Number/Name) PE 0603211F / Aerospace Technology Dev /Demo				Project (Number/Name) 634920 / Flight Vehicle Tech Integration			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
634920: Flight Vehicle Tech Integration	0.000	12.337	26.807	12.221	0.000	12.221	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
This project demonstrates advanced aerospace vehicle technologies. Aerospace Vehicle Technology Integration efforts are accomplished through integration of various technologies to include avionics, advanced propulsion, and weapon systems for demonstration in near-realistic operational environments. Advanced aerospace structures technologies are demonstrated to enhance the capability of current and future aerospace vehicles.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2024	FY 2025	FY 2026	
Title: Aerospace Vehicle Integration and Demonstration									12.337	16.807	12.221	
Description: FY 2026 Change - Effort "Aerospace Vehicle Technology Integration" retitled "Aerospace Vehicle Integration and Demonstration"												
Develop, simulate, and demonstrate multiple air vehicle technologies for vehicle integration and autonomous collaboration in multi-mission systems to improve the performance of aerospace platform capabilities.												
FY 2025 Plans:												
- Stop research for aircraft drag reduction efforts.												
- Initiate ground testing of the affordable unmanned weapons platform.												
- Initiate integrated demonstrations of the sensor variant of the low-cost unmanned system.												
- Continue technology demonstration of a forward, weapons-capable low-cost unmanned aerospace system.												
- Complete the build of the affordable unmanned sensor platform.												
- Complete basic flight testing.												
FY 2026 Plans:												
- Complete ground testing of the affordable unmanned non-kinetic weapon platforms for affordable mass via future autonomous collaborative unmanned platform payload capabilities												
-Activities include ground tests to confirm airworthiness retention due to configuration modifications.												
- Complete integrated demonstrations of mission systems to the sensor variant of the low-cost unmanned platform for affordable mass via follow-on flight demonstrations of various sensor mission enabled aircraft for initial assessment.												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603211F / <i>Aerospace Technology Dev /Demo</i>	Project (Number/Name) 634920 / <i>Flight Vehicle Tech Integration</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
-Activities include design and physical implementations of various sensing mission payloads; airworthiness assessment of aircraft as configured. - Complete technology demonstration of a forward, non-kinetic weapons-capable low-cost unmanned aerospace system for affordable mass with mission relevant future unmanned platform capabilities -Activities include studies, analysis, and ground demonstration. - Initiate integration flight demonstrations of the sensor variant of the low-cost unmanned platform to provide mission performance assessment of various payloads as-configured on the sensor variant -Activities include flight demonstrations of various integrated sensing mission payloads and configurations. <i>FY 2025 to FY 2026 Increase/Decrease Statement:</i> - FY 2026 decreased compared to FY 2025 by \$4.586 million due to the completion of the affordable unmanned sensor platform and completion of basic flight testing.			
Accomplishments/Planned Programs Subtotals		12.337	16.807
		FY 2024	FY 2025
<i>Congressional Add:</i> Program increase - digital thread capabilities		-	10.000
<i>FY 2025 Plans:</i> Conduct Congressionally directed effort.			
Congressional Adds Subtotals		-	10.000
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
Not Applicable.			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 3					R-1 Program Element (Number/Name) PE 0603211F / Aerospace Technology Dev /Demo				Project (Number/Name) 634921 / Aircraft Propulsion Subsystems Int			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
634921: Aircraft Propulsion Subsystems Int	0.000	0.000	20.200	19.952	0.000	19.952	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops and demonstrates technology to increase military utility by improving turbine engine operational reliability, durability, mission flexibility, and performance while reducing weight, fuel consumption, and cost of ownership. This project includes demonstrator engines that address military specific needs for manned systems, autonomous vehicles and munitions applications. This project also focuses on integration of inlets, nozzles, engine- to-airframe compatibility, and power and thermal management subsystems technologies.

In FY 2025, the entirety of PE 0603216F, Aerospace Propulsion and Power Technology, Project 634921 Aircraft Propulsion Subsystems Int, was transferred to PE 0603211F, Aerospace Technology Dev/Demo, Project 634921 Aircraft Propulsion Subsystems Int.

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

	FY 2024	FY 2025	FY 2026
Title: Air Breathing Propulsion Integration and Demonstration	0.000	0.000	19.952
Description: This effort develops and demonstrates technology to increase military utility. This is achieved by improving turbine engine operational reliability, durability, mission flexibility, and performance while reducing weight, fuel consumption, and cost of ownership. This includes demonstrator engines that address military specific needs for manned systems, autonomous vehicles and munitions applications. This effort also focuses on integration of inlets, nozzles, engine-to-airframe compatibility, and power and thermal management subsystems technologies. FY 2026 change - due to administrative transfer of work and funding to system level versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work. FY 2025 Plans: FY 2025 work and \$14.671 million transferred from Expendable/Autonomous Vehicle Engine Capability effort: - Continue new engine technologies to deliver reduced takeoff length, increased range, loiter, combat maneuverability, and lower cost for affordable UAS in contested environments, advancing novel augmentor technology design. - Initiate military utility studies for autonomous vehicles powered by air breathing propulsion. FY 2025 work and \$5.416 million transferred from Core Engine Technologies effort:			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603211F / <i>Aerospace Technology Dev /Demo</i>	Project (Number/Name) 634921 / <i>Aircraft Propulsion Subsystems Int</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Continue advanced propulsion air frame integration experiments to enable embedded propulsion systems; validating methodologies to enable embedded turbine engine propulsion. FY 2026 Plans: - Continue new engine technologies to deliver reduced takeoff length, increased range, loiter, combat maneuverability, and lower cost for affordable unmanned aerial systems in contested environments. -Activities include affordable mass via advanced novel augmentor technology design. - Complete studies for autonomous vehicles powered by air breathing propulsion for affordable mass -Activities include military utility studies. - Continue advanced propulsion air frame integration experiments to enable embedded propulsion systems for affordable mass via embedded turbine engine propulsion. -Activities include model Based Systems Engineering for capturing advanced augmentor impacts to embedded fans and advanced augmentor preliminary design review. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 change - due to administrative transfer of work and funding to system level versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work to Air Breathing Propulsion Integration and Demonstration (details below): FY 2026 increased compared to FY 2025 by \$19.952 million: - \$20.200 million increase due to: - Work and \$14.671 million was transferred from Expendable/Autonomous Vehicle Engine Capability effort; - Work and \$5.416 million was transferred from Core Engine Technologies effort; and - \$0.113 million was transferred from High Pressure Ratio Core Engine Technologies - \$0.248 million decrease in Aircraft Propulsion Subsystems Int project due to completion of operational analysis of UAV systems, propulsion fuel technologies, and rotating detonation and medium scale engines.			
Title: Expendable/Autonomous Vehicle Engine Capability		0.000	14.671
Description: Design, fabricate, and test component technologies for non-man rated engine applications to improve the performance, durability, and affordability of autonomous vehicles and munitions.			0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603211F / <i>Aerospace Technology Dev /Demo</i>	Project (Number/Name) 634921 / <i>Aircraft Propulsion Subsystems Int</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
FY 2026 change - due to administrative transfer of work and funding to system level versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work. FY 2025 Plans: - Complete operational benefits analysis for missile and unmanned aerial vehicle (UAV) systems. - Complete development of pervasive, hydrocarbon pressure gained propulsion fueled technologies. - Complete advanced development in rotating detonation engine technologies to advance powered munitions. - Continue new engine technologies to deliver reduced takeoff length, increased range, loiter, combat maneuverability, and lower cost for affordable UAS in contested environments, advancing novel augmentor technology design. - Initiate military utility studies for autonomous vehicles powered by air breathing propulsion. FY 2026 Plans: - Starting in FY 2026, this work is transferred Air Breathing Propulsion Integration and Demonstration effort. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$14.671 million due to administrative transfer of work and funding to system level versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work to Air Breathing Propulsion Integration and Demonstration effort.			
Title: Core Engine Technologies Description: Design, fabricate, and demonstrate performance predictions in core engines, using innovative engine cycles and advanced materials for turbine engines. FY 2026 change - due to administrative transfer of work and funding to system level versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work. FY 2025 Plans: - Complete core tests for medium scale engines maturing key technologies. - Complete risk reduction component tests for medium- scale engine advanced fan and core.		0.000	5.416
			0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603211F / <i>Aerospace Technology Dev /Demo</i>	Project (Number/Name) 634921 / <i>Aircraft Propulsion Subsystems Int</i>		
B. Accomplishments/Planned Programs (\$ in Millions) - Continue advanced propulsion air frame integration experiments to enable embedded propulsion systems; validating methodologies to enable embedded turbine engine propulsion. FY 2026 Plans: Starting in FY 2026, this work is transferred Air Breathing Propulsion Integration and Demonstration effort. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$5.416 million due to administrative transfer of work and funding to system level versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work to Air Breathing Propulsion Integration and Demonstration effort.		FY 2024	FY 2025	FY 2026
Title: High Pressure Ratio Core Engine Technologies Description: Design, fabricate, and demonstrate high overall pressure ratio engine cores to provide increased durability and affordability with lower fuel consumption for turbofan and turboshaft engines. FY 2025 Plans: • Complete work and maturation of medium scale core technologies. FY 2026 Plans: Not Applicable FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$0.113 million due to completion of this effort.		0.000	0.113	0.000
Accomplishments/Planned Programs Subtotals		0.000	20.200	19.952
C. Other Program Funding Summary (\$ in Millions) N/A Remarks D. Acquisition Strategy Not Applicable.				

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 3					R-1 Program Element (Number/Name) PE 0603211F / Aerospace Technology Dev /Demo				Project (Number/Name) 634926 / High Speed Systems Integ & Demo			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
634926: High Speed Systems Integ & Demo	0.000	12.909	23.715	47.378	0.000	47.378	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops, integrates and demonstrates, advanced technologies that enable future high-speed/hypersonic weapons and platforms (vehicles) via modeling, simulation and analysis (MS&A), and ground and flight tests. System level integration brings together air vehicle aerodynamics, propulsion and structural technologies and solutions with avionics, ordnance and other aerospace subsystems for demonstration in a near-realistic operational environment. Integration and technology demonstrations improve the technology readiness level appropriate for full integration and reduce the risk and time required to transition technologies into operational systems. Digital engineering is utilized to develop and deliver an integrated digital environment (IDE) to assess technology, evaluate its impacts, and make capability-focused investment decisions that support critical Air Force revolutionary military capabilities.

Efforts include: Development of integration strategies for propulsion operability across multi-Mach flight regimes (including scramjet inlet to nozzle flow-path optimization, high-Mach gas turbine engines, scramjet/dual-mode ramjet combined-cycles, and rocket-based propulsion systems enabling technologies and considerations for protecting low speed propulsion systems during high-speed/hypersonic flight); active engine controls to assure continuous positive thrust (even during mode transition); robust flame-holding to maintain stability through flight-imposed airflow distortions; maximized volume-to-surface area to minimize the thermal load imposed by high-speed flight; high-lift aerodynamic vehicle configurations for improved airframe stability and control across the widest possible range of Mach numbers and flight regimes; thermal management and electrical power systems (including fuel assessments) for improved thermodynamic cycles ensuing longer flight ranges, and enabling unique structural considerations for survivable long-range responsive strike systems.

In FY 2025, the entirety of PE 0603216F, Aerospace Propulsion and Power Technology, Project 635098 Advanced Aerospace Propulsion, is transferred to PE 0603211F, Aerospace Technology Dev/Demo, Project 634926 High-Speed Systems Integration & Demo.

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

	FY 2024	FY 2025	FY 2026
Title: High-Speed Systems Integration and Demonstration	12.909	11.606	30.834
Description: In FY 2026, the "High-Speed/Hypersonic Vehicle Technologies" effort is retitled "High-Speed Systems Integration and Demonstration". This is an administrative change to better reflect the multiphasic integration content under this effort.			
Develop, demonstrate, and integrate weapon and platform (vehicle) aero, structural and mission systems technologies to enable and improve the performance of future high-speed and hypersonic systems. Efforts enable development of feasible requirements, identify tech gaps and guide S&T investment, expand design and analysis capabilities for reusable and expendable high-speed vehicle concepts, demonstrate a multi-mission expendable hypersonic			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603211F / <i>Aerospace Technology Dev /Demo</i>	Project (Number/Name) 634926 / <i>High Speed Systems Integ & Demo</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
vehicle, improve operability during maneuvers and extended operating time, design long-range, responsive strike systems capable of take-off and landing, enable development of long-range, hypersonic multi-Mach propulsion systems which support responsive strike capability with improved acceleration and cruise efficiencies, enable multi-Mach platforms capable of normal runway, approach, departure and other off-cruise operations while maintaining high-Mach number cruise capability, and demonstrate propulsion system operability, propulsion system integration, and life assessments. FY 2025 Plans: - Continue Multi-Mission Cruiser technology maturation activities to expand performance capabilities of high-speed systems. - Continue robust digital engineering framework, model-based systems engineering, and multi-level modeling, simulation & analysis (MS&A) for accelerated, focused technology development and demonstration. - Continue design work for expendable hypersonic multi-mission Intelligence, Surveillance and Reconnaissance (ISR) and Strike demo. - Initiate technology maturation activities to investigate performance capabilities of durable hypersonic vehicles and weapons. FY 2026 Plans: - Complete Multi-Mission Cruiser technology maturation activities to expand performance capabilities of high-speed systems -Activities include development of conceptual designs, elucidating current state-of-art capability; Operational/Utility Analysis of conceptual designs; Validation of customer capability needs based requirements; and development of S&T Investment plans. - Complete robust digital engineering framework, model-based systems engineering, and MS&A for accelerated, focused technology development and demonstration. -Activities include vehicle geometry, trajectory and performance evaluations. - Complete conceptual design work for expendable hypersonic multi-mission Intelligence, Surveillance and Reconnaissance (ISR) and Strike demo. Preliminary design effort on hold (in abeyance) pending development of customer requirements. -Activities include demonstration of hypersonic vehicles subsystems and digital integration of the same into a flight vehicle. - Continue technology maturation activities to investigate performance capabilities of responsive strike hypersonic vehicles. -Activities include demonstration of performance, thermal management, structural feasibility and operability for higher Mach speeds.			
			FY 2026

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 3		R-1 Program Element (Number/Name) PE 0603211F / Aerospace Technology Dev /Demo		Project (Number/Name) 634926 / High Speed Systems Integ & Demo	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
- Initiate high-speed airframe propulsion integration technology development focused on inlet and nozzle configurations, high-speed propulsion dual-mode scramjet and the necessary high temperature seals and actuation methods. -Activities include platform conceptual designs and trade studies of analytical solutions for design configurations to be evaluated in ground tests, and high-speed dual-mode scramjet design, tool development and design optimization/validation for heat release and distortion, trade studies for high-speed direct-connect engine testing - Initiate technology development addressing aerodynamic challenges encountered by a durable hypersonic platform operating across a wide Mach range. -Activities include studies on low-speed performance, configuration trades, and data collection on high-speed platforms operating outside of cruise conditions. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$19.228 million in High-Speed Systems Integration and Demonstration due to increased emphasis in hypersonic platform and weapon systems technology development, design work and integration activities.					
Title: High-Speed Propulsion Integration and Demonstration Description: This project develops and demonstrates, via ground and flight tests, the scramjet propulsion cycle to a technology readiness level appropriate for full integration with other engine cycles (including turbine and rocket-based) to provide the Air Force with transformational military capabilities. Multi-cycle engines will provide the propulsion systems for possible application to support aircraft and weapon platforms. Efforts include scramjet flow-path optimization to enable operation over the widest possible range of Mach numbers; active combustion control to assure continuous positive thrust (even during mode transition); robust flame-holding to maintain stability through flow distortions; and maximized volume-to-surface area to minimize the thermal load imposed by the high-speed engine. Thermal management plays a vital role in scramjet and combined cycle engines, including considerations for protecting low speed propulsion systems (e.g., turbine engines) during hypersonic flight. Efforts will enable responsive strike mission by improving operability including robust operation during maneuvers and extended operating time, improving engine performance and operations using active engine control, development of feasible requirements for multi-mission expendable and durable hypersonic vehicle that are both achievable and fully address future operational capability needs, as well as identify S&T investments required to address current technology gaps. In FY 2026, the "Scramjet Technologies" effort was retitled "High-Speed Propulsion Integration and Demonstration". This is an administrative change to reflect the various propulsion approaches being developed under this effort. FY 2025 Plans:			0.000	12.109	16.544

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 3		R-1 Program Element (Number/Name) PE 0603211F / <i>Aerospace Technology Dev /Demo</i>		Project (Number/Name) 634926 / <i>High Speed Systems Integ & Demo</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
- Continue development and integration of larger scale scramjet component technologies to enhance operability including robust operation during maneuvers and extended operating time. - Continue development and demonstration of tactically relevant scramjet engine designs, technologies, and components including ground and flight demonstrations needed for potential follow-on acquisition program. - Continue propulsion technology maturation activities for multi-mission cruiser concept to expand performance capabilities of high-speed systems. - Continue integration of scramjet components into hypersonic multi-mission Intelligence, Surveillance and Reconnaissance (ISR) and Strike demo design. - Initiate technology maturation activities to investigate, develop, and demonstrate propulsion capabilities for durable, survivable hypersonic vehicles FY 2026 Plans: - Continue development and integration of larger scale scramjet component technologies. -Activities include thrust performance, structural and operability evaluations. - Complete development and demonstration of tactically relevant scramjet engine designs, technologies, and components. -Activities include conducting sounding rockets-based flight tests, integrated freejet tests, and performing post-test data analysis. - Continue propulsion technology maturation activities for multi-mission cruiser concept to expand performance capabilities of high-speed systems. -Activities include development of conceptual designs; elucidating the current state-of-art capability; Operational/Utility Analysis Validation of customer capability-needs based requirements; and development of S&T Investment plans. - Complete integration of scramjet components into hypersonic multi-mission Intelligence, Surveillance and Reconnaissance (ISR) and Strike demo design. - Activities include demonstration of hypersonic vehicles subsystems and digital integration of the same into a flight vehicle. - Continue technology maturation activities to investigate, develop, and demonstrate propulsion capabilities for durable, survivable hypersonic vehicles.					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603211F / <i>Aerospace Technology Dev /Demo</i>	Project (Number/Name) 634926 / <i>High Speed Systems Integ & Demo</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
-Activities include propulsion model predictions and validation testing, and life prediction and structural validation testing for acceptance and maintenance. <i>FY 2025 to FY 2026 Increase/Decrease Statement:</i> FY 2026 increased compared to FY 2025 by \$4.435 million due to increased emphasis and work in reusable responsive strike capability.			
Accomplishments/Planned Programs Subtotals		12.909	23.715
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
Not Applicable.			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 3					R-1 Program Element (Number/Name) PE 0603211F / Aerospace Technology Dev /Demo				Project (Number/Name) 634927 / Flight Systems Control			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
634927: Flight Systems Control	0.000	17.722	10.918	16.912	0.000	16.912	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
This project integrates and demonstrates advanced control technologies that improve the performance, reliability, safety, and survivability of existing and future, manned and unmanned, aerospace systems. Enhanced capabilities are enabled by control, automation, and system level integration of subsystems and systems such as propulsion, airframes, avionics, power & thermal management, weapons, C2, mission systems, and operator interfaces. Modeling and simulation, integration, and technology demonstrations in a near-operational environment reduce the risk and time required to transition technologies into existing and future aerospace systems.												
In FY 2025, the entirety of PE 0603216F, Aerospace Propulsion and Power Technology, Project 633035 Aerospace Power Technology, was transferred to PE 0603211F, Aerospace Technology Dev/Demo, Project 634927 Flight Systems Control.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2024	FY 2025	FY 2026	
Title: Autonomous Systems Control Integration and Demonstration									8.088	0.797	2.797	
Description: Develop, simulate, and demonstrate integrated control, autonomy, and system management for advanced, heterogeneous autonomous collaborative platforms and affordable mass. This may include relevant architectures and components for power generation, conditioning, and distribution; energy storage components; thermal management; flight control; flight and mission autonomy; other subsystems necessary for safe flight and cooperative operations of manned and unmanned aircraft in complex, dynamic mission environments.												
In FY 2026 effort "Autonomous Systems Control" effort is retitled "Autonomous Systems Control Integration and Demonstration" effort.												
FY 2026 change - due to administrative transfer of work and funding to system level versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work.												
FY 2025 Plans:												
- Complete research to incorporate autonomous and safe airspace interoperability for manned and remotely piloted aircraft systems, airborne control of teams of unmanned aircraft, and unmanned sense and avoid technologies for ground and air operations.												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603211F / Aerospace Technology Dev /Demo	Project (Number/Name) 634927 / Flight Systems Control		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Continue development and autonomy spiral demonstrations of advanced autonomy to manage a heterogeneous team of affordable and expendable aircraft without human interaction in complex missions and challenging threat environments to include definition and scoping of flight experiment to accelerate transition of fully autonomous team capabilities. FY 2026 Plans: - Complete development and autonomy spiral demonstrations of advanced autonomy -Activities include a series of simulated and surrogate flight experiments addressing missions and environments of increased complexity/threat. - Initiate development of advanced contingency management capabilities required for credible affordable mass - Activities include identification of flight critical and non-flight critical contingencies and mitigations to be addressed. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$2.000 million due to: - Administrative transfer of work and funding to system level versus component level thrusts to enable acceleration of integrated system capabilities and capture realistic representation of work to Autonomous Systems Control Integration and Demonstration; and - Increased emphasis in affordable mass and initiation of autonomy work to enable advanced contingency management capabilities.				
Title: Power & Thermal Systems Integration and Demonstration Description: Description: Develop and demonstrate integrated architecture, controls and components for power generation, conditioning, and distribution; energy storage components; and thermal management and subsystem technologies for integration into high power or high-speed aircraft. Address volumetric and thermal challenges to system integration as well as operational challenges to provide affordable mass with sufficient quality power for the mission systems and payloads of autonomous collaborative platforms. Address long duration high-speed platform challenges to enable responsive strike. In FY 2026 effort "High Power Aircraft Subsystem Technologies" effort retitled "Power & Thermal Systems Integration and Demonstration" effort. FY 2025 Plans: - Continue development and demonstration of integrated power, thermal, and propulsion technologies for medium-scale systems including an initial hybrid architecture design to enable future electrified autonomous collaborative platform concepts.		0.000	10.121	14.115

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603211F / <i>Aerospace Technology Dev /Demo</i>	Project (Number/Name) 634927 / <i>Flight Systems Control</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Complete architecture and technology assessment and digital integration. FY 2026 Plans: - Complete development and demonstration of integrated power, thermal, and propulsion technologies -Activities include initial architecture design. - Initiate development of component technologies -Activities include lower cost electric actuation, and power generation design. - Initiate aircraft-scale power generation integrated concept design -Activities include key turbine component detailed design. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$3.994 million due to increased emphasis and the urgent demand for power and thermal capabilities and component technologies for autonomous collaborative platform and high-speed platform design, development and demonstration.			
Accomplishments/Planned Programs Subtotals		8.088	10.918
		FY 2024	FY 2025
Congressional Add: Program increase - bonded unitized composites large scale structural demonstration		9.634	-
FY 2024 Accomplishments: Conduct Congressionally directed efforts.			
Congressional Adds Subtotals		9.634	-
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
Not Applicable.			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force **Date:** June 2025

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>					R-1 Program Element (Number/Name) PE 0603216F / <i>Aerospace Propulsion and Power Technology</i>							
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
Total Program Element	0.000	92.129	0.000	0.000	0.000	0.000	-	-	-	-	-	-
633035: <i>Aerospace Power Technology</i>	0.000	16.046	0.000	0.000	0.000	0.000	-	-	-	-	-	-
634093: <i>Missile Rocket Propulsion Integ & Demo</i>	0.000	37.838	0.000	0.000	0.000	0.000	-	-	-	-	-	-
634921: <i>Aircraft Propulsion Subsystems Int</i>	0.000	16.370	0.000	0.000	0.000	0.000	-	-	-	-	-	-
635098: <i>Advanced Aerospace Propulsion</i>	0.000	21.875	0.000	0.000	0.000	0.000	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This program develops and demonstrates technologies to achieve enabling and revolutionary advances in turbine, advanced-cycle, rocket, and space propulsion as well as electrical power, thermal management, and fuels. The program has five current projects, each focusing on technologies with a high potential to enhance the performance of existing and future Air Force weapon systems. The Aerospace Power Technology project develops and demonstrates adaptive power and thermal management components, controls, and systems for high-power payloads and aircraft as part of energy-optimized aircraft development. The Aircraft Propulsion Subsystems Integration project develops demonstrator engines by integrating the engine cores demonstrated in the Advanced Turbine Engine Gas Generator project with low-pressure components. The Advanced Aerospace Propulsion project develops the scramjet propulsion cycle to a technology readiness level appropriate for in-flight demonstration and for full integration with other engine cycles (including turbine and rocket based). The Advanced Turbine Engine Gas Generator project develops and demonstrates core turbine engine technologies for current and future aircraft propulsion systems. The Missile Rocket Propulsion project develops and demonstrates innovative rocket propulsion technologies, propellants, and manufacturing techniques.

In FY 2025, the RDT&E Budget Activity 03 (BA03) Aerospace Propulsion and Power Technology efforts and activities under PE 0603216F, was transferred to PE 0603211F, Aerospace Technology Dev/Demo for increased integration between airframe, flight control, propulsion, electrical, power and thermal management.

In FY 2025, the entirety of PE 0603216F, Aerospace Propulsion and Power Technology, Project 633035 Aerospace Power Technology, was transferred to PE 0603211F, Aerospace Technology Dev/Demo, Project 634927 Flight Systems Control.

In FY 2025, the entirety of PE 0603216F, Aerospace Propulsion and Power Technology, Project 634093 Missile Rocket Propulsion Integ & Demo, was transferred to PE 0603211F, Aerospace Technology Dev/Demo, Project 634093 Missile Rocket Propulsion Integ & Demo.

In FY 2025, the entirety of PE 0603216F, Aerospace Propulsion and Power Technology, Project 634921 Aircraft Propulsion Subsystems Int, was transferred to PE 0603211F, Aerospace Technology Dev/Demo, Project 634921 Aircraft Propulsion Subsystems Int.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force				Date: June 2025		
Appropriation/Budget Activity		R-1 Program Element (Number/Name)				
3600: Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)		PE 0603216F I Aerospace Propulsion and Power Technology				
In FY 2025, the entirety of PE 0603216F, Aerospace Propulsion and Power Technology, Project 635098 Advanced Aerospace Propulsion, was transferred to PE 0603211F, Aerospace Technology Dev/Demo, Project 634926 High Speed Systems Integ & Demo.						
This program element may include necessary civilian pay expenses required to manage, execute, and deliver science & technology capabilities. The use of program funds in this program element would be in addition to the civilian pay expenses budgeted in program elements 0601102F, 0602020, 0602102F, 0602202F,0602203F, 0602204F, 0602602F, 0602605F, 0602788F, 0602298F, and 1206601SF.						
This program element may include necessary expenses to support the operation and maintenance of facilities to manage, execute, and deliver science and technology capabilities.						
Projects in this program have been coordinated through the Department of Defense (DoD) Science and Technology (S&T) Executive Committee process to harmonize efforts and eliminate duplication.						
This program is in Budget Activity 3, Advanced Technology Development because this budget activity includes development of subsystems and components and efforts to integrate subsystems and components into system prototypes for field experiments and/or tests in a simulated environment.						
B. Program Change Summary (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Previous President's Budget		56.789	0.000	0.000	0.000	0.000
Current President's Budget		92.129	0.000	0.000	0.000	0.000
Total Adjustments		35.340	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		41.200	0.000			
• Congressional Directed Transfers		0.000	0.000			
• Reprogrammings		0.000	0.000			
• SBIR/STTR Transfer		-3.588	0.000			
• Other Adjustments		-2.272	0.000	0.000	0.000	0.000
Congressional Add Details (\$ in Millions, and Includes General Reductions)						
Project: 633035: Aerospace Power Technology						
Congressional Add: Program increase - HTPEM Hydrogen Fuel Cells						1.926 -
Congressional Add: Program Increase: Silicon Carbide Research						4.817 -

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)		R-1 Program Element (Number/Name) PE 0603216F I Aerospace Propulsion and Power Technology	
Congressional Add Details (\$ in Millions, and Includes General Reductions)		FY 2024	FY 2025
Congressional Add Subtotals for Project: 633035		6.743	-
Project: 634093: Missile Rocket Propulsion Integ & Demo			
Congressional Add: Program increase - Infrastructure Upgrade for Hypersonic Booster Tests		5.973	-
Congressional Add: Program Increase: Altitude Chamber Infrastructure Upgrades		17.341	-
Congressional Add: Program Increase: Hybrid Rocket Engine Development		4.817	-
Congressional Add: Program Increase: Liquid Engine for Hypersonic Testing Initiative		4.817	-
Congressional Add Subtotals for Project: 634093		32.948	-
Congressional Add Totals for all Projects		39.691	-

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 3					R-1 Program Element (Number/Name) PE 0603216F / Aerospace Propulsion and Power Technology				Project (Number/Name) 633035 / Aerospace Power Technology			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
633035: Aerospace Power Technology	0.000	16.046	0.000	0.000	0.000	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
This project develops and demonstrates system and subsystem integration to include adaptive architectures, controls, actuation, electrical power, thermal management, and distribution for aerospace applications. This project develops and demonstrates the components, controls and systems required to satisfy the operational needs of current and future aircraft and enables the use of future high-power payloads. This technology enhances reliability and survivability, and reduces vulnerability, weight, and life cycle costs of air platforms. The electrical power system components developed are projected to provide a two-fold to five-fold improvement in aircraft reliability and maintainability, and a reduction in power system weight. This project is integrated into energy optimized aircraft efforts and power and thermal programs.												
In FY 2025, the entirety of PE 0603216F, Aerospace Propulsion and Power Technology, Project 633035 Aerospace Power Technology, is transferred to PE 0603211F, Aerospace Technology Dev/Demo, Project 634927 Flight Systems Control.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2024	FY 2025	FY 2026	
Title: High Power Aircraft Subsystem Technologies									9.303	0.000	0.000	
Description: Develop and demonstrate integrated architecture, controls and components for power generation, conditioning, and distribution; energy storage components; and thermal management and subsystem technologies for integration into high power aircraft.												
FY 2025 Plans: - Starting in FY 2025, this work is performed under PE 0603211F, Aerospace Technology Dev/Demo, Project 634927 Flight Systems Control, High Power Aircraft Subsystem Technologies effort.												
FY 2026 Plans: Not Applicable												
FY 2025 to FY 2026 Increase/Decrease Statement: No FY 2026 funding is required												
Accomplishments/Planned Programs Subtotals									9.303	0.000	0.000	
							FY 2024	FY 2025				
Congressional Add: Program increase - HTPM Hydrogen Fuel Cells							1.926	-				

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603216F / <i>Aerospace Propulsion and Power Technology</i>	Project (Number/Name) 633035 / <i>Aerospace Power Technology</i>

	FY 2024	FY 2025
<i>FY 2024 Accomplishments:</i> Conduct Congressionally directed efforts. This effort will be executed in Program 0603216F, Aerospace Propulsion and Power Technology, Project 633035, Aerospace Power Technology.		
<i>Congressional Add:</i> Program Increase: Silicon Carbide Research	4.817	-
<i>FY 2024 Accomplishments:</i> Conduct Congressionally directed efforts. This effort will be executed in Program 0603216F, Aerospace Propulsion and Power Technology, Project 633035, Aerospace Power Technology.		
Congressional Adds Subtotals	6.743	-

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

N/A

Remarks

D. Acquisition Strategy

Not applicable.

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 3					R-1 Program Element (Number/Name) PE 0603216F / Aerospace Propulsion and Power Technology				Project (Number/Name) 634093 / Missile Rocket Propulsion Integ & Demo			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
634093: Missile Rocket Propulsion Integ & Demo	0.000	37.838	0.000	0.000	0.000	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops technologies for the sustainment of strategic systems (including solid rocket motor boosters and missile propulsion, post boost control, and aging and surveillance efforts) and tactical rockets. Characteristics such as environmental acceptability, affordability, reliability, responsiveness, reduced weight, and reduced operation and launch costs are emphasized. Increased life and performance of propulsion systems are key goals. Technology areas investigated include ground demonstrations of compact, lightweight, advanced propulsion technologies and high-energy propellants. Aging and surveillance thrusts for solid rocket motors could reduce lifetime prediction uncertainties for individual motors by fifty percent, enabling motor replacement for cause. The efforts in this project contribute to the sustainment of the rocket propulsion industry, providing rocket propulsion technology for the entire Department of Defense (DoD). The efforts in this project are reviewed by a DoD level steering committee annually for relevance to DoD missions.

This project includes the initiation and development of programs addressing DAF capability gaps and provides technologies for transformational future force capabilities. Transformational efforts will be identified through a competitive process and be responsive to DAF design priorities. Selected efforts will be designated as transformational, indicating enterprise-level priority.

In FY 2025, the entirety of PE 0603216F, Aerospace Propulsion and Power Technology, Project 634093 Missile Rocket Propulsion Integ & Demo, is transferred to PE 0603211F, Aerospace Technology Dev/Demo, Project 634093 Missile Rocket Propulsion Integ & Demo.

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

	FY 2024	FY 2025	FY 2026
Title: Ballistic Missile Technologies	4.890	0.000	0.000
Description: Develop and demonstrate missile propulsion and post-boost control systems technologies for ballistic missiles.			
FY 2025 Plans: - Starting in FY 2025, this work is performed under PE 0603211F, Aerospace Technology Dev/Demo, Project 634093 Missile Rocket Propulsion Integ & Demo, Missile Propulsion Technologies effort.			
FY 2026 Plans: Not Applicable			
FY 2025 to FY 2026 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603216F / <i>Aerospace Propulsion and Power Technology</i>	Project (Number/Name) 634093 / <i>Missile Rocket Propulsion Integ & Demo</i>	
B. Accomplishments/Planned Programs (\$ in Millions) No FY26 funding is required		FY 2024	FY 2025
Accomplishments/Planned Programs Subtotals		4.890	0.000
	FY 2024	FY 2025	
Congressional Add: Program increase - Infrastructure Upgrade for Hypersonic Booster Tests FY 2024 Accomplishments: Conduct Congressionally directed efforts. This effort will be executed in Program 0603216F, Aerospace Propulsion and Power Technology, Project 634093 Missile Rocket Propulsion Integ & Demo.	5.973	-	
Congressional Add: Program Increase: Altitude Chamber Infrastructure Upgrades FY 2024 Accomplishments: Conduct Congressionally directed efforts. This effort will be executed in Program 0603216F, Aerospace Propulsion and Power Technology, Project 634093 Missile Rocket Propulsion Integ & Demo.	17.341	-	
Congressional Add: Program Increase: Hybrid Rocket Engine Development FY 2024 Accomplishments: Conduct Congressionally directed efforts. This effort will be executed in Program 0603216F, Aerospace Propulsion and Power Technology, Project 634093 Missile Rocket Propulsion Integ & Demo.	4.817	-	
Congressional Add: Program Increase: Liquid Engine for Hypersonic Testing Initiative FY 2024 Accomplishments: Conduct Congressionally directed efforts. This effort will be executed in Program 0603216F, Aerospace Propulsion and Power Technology, Project 634093 Missile Rocket Propulsion Integ & Demo.	4.817	-	
Congressional Adds Subtotals	32.948	-	
C. Other Program Funding Summary (\$ in Millions) N/A Remarks D. Acquisition Strategy Not applicable			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 3					R-1 Program Element (Number/Name) PE 0603216F / <i>Aerospace Propulsion and Power Technology</i>				Project (Number/Name) 634921 / <i>Aircraft Propulsion Subsystems Int</i>			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
634921: <i>Aircraft Propulsion Subsystems Int</i>	0.000	16.370	0.000	0.000	0.000	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops and demonstrates technology to increase turbine engine operational reliability, durability, mission flexibility, and performance while reducing weight, fuel consumption, and cost of ownership. The Aircraft Propulsion Subsystems Integration (APSI) project includes demonstrator engines for manned systems and efficient small-scale propulsion for remotely piloted aircraft and cruise missile applications. The demonstrator engines integrate the core (high- pressure spool) technology developed under a joint multi-agency and aerospace industry project with the engine (low-pressure spool) technology such as fans, turbines, engine controls, mechanical systems, exhaust nozzles, and augmentors. Additionally, this project includes activities to improve propulsion safety and readiness. This project also focuses on integration of inlets, nozzles, engine-to-airframe compatibility, and power and thermal management subsystems technologies. The APSI project provides aircraft with potential for longer range and higher cruise speeds with lower specific fuel consumption, surge power for successful engagements, high sortie rates with reduced maintenance, reduced life cycle cost, and improved survivability, resulting in increased mission effectiveness. Technologies developed are applicable to sustained high-speed vehicles and responsive space launch. The Aircraft Propulsion Subsystems Integration project is focused on improving propulsion capabilities while at the same time reducing the cost of ownership. Anticipated technology advances include turbine engine improvements providing approximately twice the range for a sustained supersonic combat aircraft, doubling the time on station with ten times the power output for surveillance aircraft and propulsion for a high speed supersonic missile with double the range for time sensitive targets.

This project includes the initiation and development of programs addressing DAF capability gaps and provides technologies for transformational future force capabilities. Transformational efforts will be identified through a competitive process and be responsive to DAF design priorities. Selected efforts will be designated as transformational, indicating enterprise-level priority.

In FY 2023, Core Engine Technologies, High Pressure Ratio Core Engine Technologies, and Adaptive Turbine Engine Core Technology efforts transferred from Program 0603216F, Aerospace Propulsion & Power Technology, Project 63681B, Advanced Turbine Engine Gas Generator to Program 0603216F, Aerospace Propulsion and Power Technology, Project 634921, Aircraft Propulsion Subsystems Integration in order to effectively and efficiently align resources to Aerospace Systems Core Technical Competencies.

In FY 2025, the entirety of PE 0603216F, Aerospace Propulsion and Power Technology, Project 634921 Aircraft Propulsion Subsystems Int, is transferred to PE 0603211F, Aerospace Technology Dev/Demo, Project 634921 Aircraft Propulsion Subsystems Int.

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

	FY 2024	FY 2025	FY 2026
Title: Missile/Remotely Piloted Aircraft Engine Performance	13.126	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603216F / Aerospace Propulsion and Power Technology	Project (Number/Name) 634921 / Aircraft Propulsion Subsystems Int		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
Description: Design, fabricate, and test component technologies for limited-life engines to improve the performance, durability, and affordability of missile and remotely piloted aircraft engines. FY 2025 Plans: - Starting in FY 2025, this work is performed under PE 0603211F, Aerospace Technology Dev/Demo, Project 634921 Aircraft Propulsion Subsystems Int, Expendable/Autonomous Vehicle Engine Capability effort. FY 2026 Plans: Not Applicable FY 2025 to FY 2026 Increase/Decrease Statement: No FY 2026 funding is required				
Title: Core Engine Technologies Description: Design, fabricate, and demonstrate performance predictions in core engines, using innovative engine cycles and advanced materials for turbofan and for turbojet engines. FY 2025 Plans: - Starting in FY 2025, this work is performed under PE 0603211F, Aerospace Technology Dev/Demo, Project 634921 Aircraft Propulsion Subsystems Int, Core Engine Technologies effort. FY 2026 Plans: Not Applicable FY 2025 to FY 2026 Increase/Decrease Statement: No FY 2026 funding is required		1.854	0.000	0.000
Title: High Pressure Ratio Core Engine Technologies Description: Design, fabricate, and demonstrate high overall pressure ratio engine cores to provide increased durability and affordability with lower fuel consumption for turbofan and for turboshaft engines. FY 2025 Plans: - Starting in FY 2025, this work is performed under PE 0603211F, Aerospace Technology Dev/Demo, Project 634921 Aircraft Propulsion Subsystems Int, High Pressure Ratio Core Engine Technologies effort. FY 2026 Plans:		1.390	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603216F / Aerospace Propulsion and Power Technology	Project (Number/Name) 634921 / Aircraft Propulsion Subsystems Integration		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
Not Applicable				
FY 2025 to FY 2026 Increase/Decrease Statement: No FY 2026 funding is required				
Accomplishments/Planned Programs Subtotals		16.370	0.000	0.000
C. Other Program Funding Summary (\$ in Millions) N/A				
Remarks				
D. Acquisition Strategy Not applicable.				

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 3					R-1 Program Element (Number/Name) PE 0603216F / <i>Aerospace Propulsion and Power Technology</i>				Project (Number/Name) 635098 / <i>Advanced Aerospace Propulsion</i>			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
635098: <i>Advanced Aerospace Propulsion</i>	0.000	21.875	0.000	0.000	0.000	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops and demonstrates, via ground and flight tests, the scramjet propulsion cycle to a technology readiness level appropriate for full integration with other engine cycles (including turbine and rocket-based) to provide the Air Force with transformational military capabilities. The primary focus is on the hydrocarbon-fueled, scramjet engine. Multi-cycle engines will provide the propulsion systems for possible application to support aircraft and weapon platforms. Efforts include: scramjet flow-path optimization to enable operation over the widest possible range of Mach numbers; active combustion control to assure continuous positive thrust (even during mode transition); robust flame-holding to maintain stability through flow distortions; and maximized volume-to-surface area to minimize the thermal load imposed by the high-speed engine. Thermal management plays a vital role in scramjet and combined cycle engines, including considerations for protecting low speed propulsion systems (e.g., turbine engines) during hypersonic flight.

In FY 2025, the entirety of PE 0603216F, Aerospace Propulsion and Power Technology, Project 635098 Advanced Aerospace Propulsion, is transferred to PE 0603211F, Aerospace Technology Dev/Demo, Project 634926 High Speed Systems Integ & Demo.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2024	FY 2025	FY 2026
Title: Scramjet Technologies Description: Develop and demonstrate technologies for a hydrocarbon-fueled scramjet with robust operation. FY 2025 Plans: - Starting in FY 2025, this work is performed under PE 0603211F, Aerospace Technology Dev/Demo, Project 634926 High Speed Systems Integ & Demo, Scramjet Technologies effort. FY 2026 Plans: Not Applicable FY 2025 to FY 2026 Increase/Decrease Statement: No FY 2026 funding is required	21.875	0.000	0.000
Accomplishments/Planned Programs Subtotals	21.875	0.000	0.000

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

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603216F / Aerospace Propulsion and Power Technology	Project (Number/Name) 635098 / Advanced Aerospace Propulsion
C. Other Program Funding Summary (\$ in Millions)		
Remarks		
D. Acquisition Strategy		
Not applicable.		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force **Date:** June 2025

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603270F / <i>Electronic Combat Technology</i>

COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
Total Program Element	0.000	30.543	36.445	0.000	0.000	0.000	-	-	-	-	-	-
633720: <i>EW Quick Reaction Capabilities</i>	0.000	18.409	22.125	0.000	0.000	0.000	-	-	-	-	-	-
63431G: <i>RF Warning & Countermeasures Tech</i>	0.000	12.134	14.320	0.000	0.000	0.000	-	-	-	-	-	-

Note

In FY 2026, in order to better plan, execute, and demonstrate integrated sensing and spectrum dominance technologies/capabilities, funding and technical work was transferred from this program into Program Element 0603203F, Advanced Aerospace Sensors, Project 63665A, Advanced Aerospace Sensors Technology.

A. Mission Description and Budget Item Justification

This program develops and demonstrates technologies to support Air Force electronic combat warfighting capabilities. The program focuses on developing components, subsystems, and technologies with potential aerospace, special operations, and airlift electronic combat applications. It develops and demonstrates technologies for integrating electronic combat sensors and systems into a fused and seamless whole. It integrates and focuses research efforts in electronic warfare and cyber warfare to rapidly demonstrate a capability for rapid fielding. It develops and demonstrates technologies for navigation and timing in radio frequency (RF) contested and denied environments. It develops and demonstrates advanced technologies for radio frequency electronic combat suites and advanced warning and countermeasure technologies to defeat electro-optical, infrared, and laser threats to aerospace platforms. It also develops and demonstrates technologies that will enable mission systems to be more resilient, agile, autonomous, and be able to operate in multiple domains. This program has been coordinated through the Department of Defense (DoD) Science and Technology (S&T) Executive Committee process to harmonize efforts and eliminate duplication.

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

In FY 2026, in order to better plan, execute, and demonstrate integrated sensing and spectrum dominance technologies/capabilities, funding and technical work was transferred from this program into Program Element 0603203F, Advanced Aerospace Sensors, Project 63665A, Advanced Aerospace Sensors Technology.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force				Date: June 2025	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
3600: Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)		PE 0603270F I Electronic Combat Technology			
B. Program Change Summary (\$ in Millions)	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Previous President's Budget	32.510	36.445	37.374	0.000	37.374
Current President's Budget	30.543	36.445	0.000	0.000	0.000
Total Adjustments	-1.967	0.000	-37.374	0.000	-37.374
• 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	-0.667	0.000			
• Other Adjustments	-1.300	0.000	-37.374	0.000	-37.374
Change Summary Explanation					
The FY 2026 \$37.374 million decrease is due to the consolidation of all funding and technical work from Program Element 0603270F, Electronic Combat Technology, to Program Element 0603203F, Advance Aerospace Sensors.					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 3					R-1 Program Element (Number/Name) PE 0603270F / <i>Electronic Combat Technology</i>				Project (Number/Name) 633720 / <i>EW Quick Reaction Capabilities</i>			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
633720: <i>EW Quick Reaction Capabilities</i>	0.000	18.409	22.125	0.000	0.000	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2026, the technical work and funding in this project is being integrated into Program 0603203F, Advanced Aerospace Sensors; Project 63665A, Advanced Aerospace Sensors Technology; Spectrum Dominance Technology Demonstrations Effort to facilitate integrated capability development.

A. Mission Description and Budget Item Justification

This project establishes a capability to rapidly assess, develop and demonstrate new electronic warfare concepts, techniques, and capabilities as well as the required position navigation and timing technologies and capabilities in the context of systemic electronic warfare effects (electronic warfare threat interactions) in a congested/contested electromagnetic spectrum, system-of-systems environment of the future. It develops disruptive electronic warfare and countermeasures concepts specifically selected for high-impact, game-changing effects; evaluates them in high fidelity virtual and hardware evaluation settings; and demonstrates them in an operationally relevant environment. It establishes and maintains an all-source, physics-based, threat-to-countermeasures electronic warfare systems engineering methodology. It develops a core analytic function, supported by simulation-based wargaming and interactive engineering modeling capabilities to evaluate advanced countermeasures concepts.

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

	FY 2024	FY 2025	FY 2026
Title: Resilient Positioning, Navigation and Timing	10.105	11.932	0.000
Description: Develop and transition robust Global Navigation Satellite System capabilities; resilient complementary position, navigation and timing techniques; precise position, navigation and timing technologies for distributed sensing/effects; position, navigation and timing technology to provide position, navigation and timing electronic warfare situational awareness and training; and position, navigation and timing architectures to enable resiliency against the rapidly evolving threat. Efforts will include prototypes and relevant Open Architecture standards where applicable to enable timely technology transition.			
FY 2025 Plans: - Continue development of technologies to establish and maintain resilient and robust positioning, navigation, and timing capabilities for airborne platforms in environments, in particular over vast spans of water. - Continue to integrate these technologies into the reference implementations aligned with the resilient embedded global positioning system-inertial and positioning, navigation and timing software defined user equipment programs of record.			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603270F / <i>Electronic Combat Technology</i>	Project (Number/Name) 633720 / <i>EW Quick Reaction Capabilities</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Continue developing, demonstrating, and promulgating navigational open architecture standards to permit integration of alternative position, navigation and timing approaches into future Department of Defense systems. FY 2026 Plans: In FY 2026 the funding and technical activities from this effort were realigned to Program Element 0603203F, Advanced Aerospace Sensors, Project 63665A, Advanced Aerospace Sensors Technology, Spectrum Warfare Technology Demonstrations Effort. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$11.932 million due to the realignment of funding and technical activities from this project to Program Element 0603203F, Advanced Aerospace Sensors; Project 63665A, Advanced Aerospace Sensors Technology; Spectrum Warfare Technology Demonstrations Effort to facilitate integrated capability development.			
Title: Integrated EW Demonstration Description: Integrate emerging technologies to develop and demonstrate electromagnetic warfare spectrum dominance concepts, technologies and techniques. Goal is to counter advanced complex electromagnetic threats in contested environments across radio frequency and electro-optic/infrared spectrums. FY 2025 Plans: - Continue the implementation of emerging electromagnetic attack and support capabilities based on operational objectives and analysis of field test results. - Continue using agile development processes to enhance the capability to rapidly respond to new and unexpected complex emitters in greater volume and in less time. - Continue expansion and maturation of modeling, simulation and laboratory capabilities for the assessment of cognitive and autonomous electronic warfare technologies for multi-spectral treats in a complex electromagnetic environment. - Continue iterating and refreshing techniques for data collection capabilities and operational test events to enhance research and development efforts. - Continue analysis from field tests to meet operational requirements for proactive detection and situation awareness for multiple Department of the Air Force platforms. FY 2026 Plans: In FY 2026 the funding and technical activities from this effort were realigned to Program Element 0603203F, Advanced Aerospace Sensors; Project 63665A, Advanced Aerospace Sensors Technology; Spectrum Dominance Technology Demonstrations Effort. FY 2025 to FY 2026 Increase/Decrease Statement:		8.304	10.193
			0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603270F / <i>Electronic Combat Technology</i>	Project (Number/Name) 633720 / <i>EW Quick Reaction Capabilities</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
FY 2026 decreased compared to FY 2025 by \$10.193 million due the realignment of funding and technical activities from this project to Program Element 0603203F, Advanced Aerospace Sensors; Project 63665A, Advanced Aerospace Sensors Technology; Spectrum Dominance Technology Demonstrations Effort to facilitate capability development.				
Accomplishments/Planned Programs Subtotals		18.409	22.125	0.000
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
Not applicable				

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 3					R-1 Program Element (Number/Name) PE 0603270F / <i>Electronic Combat Technology</i>				Project (Number/Name) 63431G / <i>RF Warning & Countermeasures Tech</i>			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
63431G: <i>RF Warning & Countermeasures Tech</i>	0.000	12.134	14.320	0.000	0.000	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY2026, the technical work and funding in project is being integrated into Program 0603203F, Advanced Aerospace Sensors; Project 63665A, Advanced Aerospace Sensors Technology; Spectrum Dominance Technology Demonstrations Effort to facilitate integrated capability development.

A. Mission Description and Budget Item Justification

This project develops and demonstrates advanced technologies for radio frequency electronic combat suites, including the required navigation technologies and capabilities, to enhance the survivability of aerospace vehicles and to provide crew situational awareness. The research addresses technologies for missile/threat warning, radio frequency receivers, electronic combat pre-processors, advanced sorting/pre-processing algorithms, and expert software for applications on existing and future electronic combat systems. The research also focuses on the development and demonstration of subsystems and components for generating on-board/off-board radio frequency countermeasure techniques to address the complete range of multispectral threats with multimode capabilities. Develops capabilities for situational awareness and countermeasures to integrated air defense systems and associated multispectral threats. Develops electromagnetic warfare focused knowledge databases, engineering models, mission simulations, analysis tools and assessment environments which enable the development of multi-domain multi-spectral electromagnetic warfare technologies. This includes the development of electronic countermeasures techniques, as well as advanced electronic countermeasures technologies such as antennas, power amplifiers, and preamplifiers. This project also aims to develop cyber resilience and protect systems through adaptation of the system to the threat. It demonstrates these technologies in open and adaptable architectures for system integration in field demonstrations and proves out the technologies through rapid integration of sensors and architectures for technology transition.

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

	FY 2024	FY 2025	FY 2026
Title: Spectrum Dominance Technology Demonstrations	12.134	14.320	0.000
Description: Develop aerospace platform jamming concepts, technologies and techniques to counter advanced radio frequency threats associated with current and future aerospace weapon systems. Provide position, navigation and system resilience via open architecture solutions.			
Note: In FY 2023 and prior this Thrust was titled "Radio Frequency Electronic Warfare Demonstrator" This change was made to accommodate the transfer of funding and technical work to this Effort from "Program Element 0603270F, Electronic Combat Technology, Project 634335, Cyber Concepts, effort Resilient and Agile Mission Systems Architecture" and "Program Element 0603270F, Electronic Combat Technology, Project 63691X, EO/IR Warning &			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603270F / <i>Electronic Combat Technology</i>	Project (Number/Name) 63431G / <i>RF Warning & Countermeasures Tech</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
Countermeasures Tech, effort Advanced Electro-Optical/Infrared Warning and Countermeasure Technologies" in order to execute these converging efforts in the Multi-Spectral domain.			
FY 2025 Plans: - Initiate effort to develop and assess multi-spectral electromagnetic support and attack concepts and technologies against emerging threats, from feedback of completed Radio Frequency Electronic Warfare Demonstrator effort. - Continue assessing operational and program office requirements to determine multi-spectral shortfalls and determine applicable modeling & simulation to evaluate shortfalls and potential technologies to address these shortfalls. - Continue expansion and maturation of modeling, simulation and laboratory assessment environments commensurate with technologies being researched, developed, and tested; including cognitive and autonomous electronic warfare technologies for multi-spectral treats in a complex electromagnetic environment. - Continue multi-spectral development within Reference Architecture Implementations and open architectures standards to support enhanced modeling, simulation and assessment. - Continue conducting technology demonstrations to support transition into Air Force platforms and electromagnetic spectrum operations units. - Continue threat characterization, countermeasures development, and field testing of new advanced threats; new advanced threats to include laser jam codes and techniques. - Continue effectiveness assessment of laser and missile warning technologies and techniques for a variety of Air Force platforms. - Continue development of advanced networking, processing, advanced computing paradigms, and cybersecurity technologies for next-generation avionics mission system capabilities. - Continue utilizing agile development processes and digital engineering techniques to further accelerate development, integration, and demonstrations to rapidly respond to new and unexpected complex emitters in realistic radio frequency environments.			
FY 2026 Plans: In FY 2026 the funding and technical activities from this effort were realigned to Program Element 0603203F, Advanced Aerospace Sensors; Project 63665A, Advanced Aerospace Sensors Technology; Spectrum Dominance Technology Demonstrations Effort.			
FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$14.320 million due to the realignment of funding and technical activities from this project to Program Element 0603203F, Advanced Aerospace Sensors; Project 63665A, Advanced Aerospace Sensors Technology; Spectrum Dominance Technology Demonstrations Effort to facilitate integrated capability development.			
Accomplishments/Planned Programs Subtotals		12.134	14.320
			0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603270F / <i>Electronic Combat Technology</i>	Project (Number/Name) 63431G / <i>RF Warning & Countermeasures Tech</i>
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy Not applicable		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
3600: Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)					PE 0603273F I Science & Technology for Nuclear Re-entry Systems							
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
Total Program Element	0.000	65.088	91.885	128.407	0.000	128.407	-	-	-	-	-	-
634094: Next Gen Platform Dev/ Demo	0.000	65.088	91.885	128.407	0.000	128.407	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Effective FY2025, PE 0603211F, Aerospace Technology Dev/Demo, Project 634094, Next Generation (Gen) Platform Dev/Demo efforts have transferred to PE 0603273F, Science & Technology for Nuclear Re-entry Systems, Project 634094, Next Gen Platform Dev/Demo, to enhance transparency and traceability of the nuclear science and technology portfolio.

A. Mission Description and Budget Item Justification

The Air Force Research Laboratory (AFRL) is focused on high-impact, multi-domain science and technology (S&T) solutions that drive innovation now while laying the groundwork for the Air and Space Forces to win the future fight. The AFRL effectively synchronizes the Department of the Air Force (DAF) S&T enterprise and workforce to align towards the most consequential DAF priorities and accelerate the delivery of game-changing S&T.

This program oversees the engineering and demonstration of advanced Department of Air Force nuclear delivery system components and technologies that support integrated nuclear deterrence operations missions. Next Generation Platform Development/Demonstration efforts are accomplished through the design, development, integration, experimentation, and evaluation of specific technologies which will enable future delivery of multiple Government Reference Designs and Government Reference Vehicles. These technologies include aeroshell modeling and re-entry system materials manufacturing; fuzing technologies for improved system trajectory performance; advanced guidance, navigation, and control systems; strategic radiation-hardened communications in representative operational nuclear environments; and the integration, experimentation, and evaluation with respect to specialized nuclear expertise and infrastructure.

This program supports Department of Defense priorities to revitalize enduring nuclear deterrence operations by modernizing and demonstrating the specialized expertise, infrastructure, and technologies necessary to address, and respond to, current and emerging multi-peer-contested nuclear environments. This effort will develop the advanced technologies necessary to effectively address peer threats and maintain operational effectiveness in a cost-effective manner by reducing technical and programmatic risks associated with the execution of collective nuclear modernization activities.

Program Element 0603211F, Project 634094, was realigned into this Program Element 0603273F, Project 634094, to enhance transparency and traceability of the Nuclear Science & Technology portfolio.

This program element may include necessary expenses to support operation and maintenance activities to manage, execute, and deliver science and technology capabilities.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force				Date: June 2025		
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)		R-1 Program Element (Number/Name) PE 0603273F I Science & Technology for Nuclear Re-entry Systems				
This program is in Budget Activity 3, Advanced Technology Development because this budget activity includes development of subsystems and components and efforts to integrate subsystems and components into system prototypes for field experiments and/or tests in a simulated environment.						
B. Program Change Summary (\$ in Millions)	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	
Previous President's Budget	70.321	91.885	127.244	0.000	127.244	
Current President's Budget	65.088	91.885	128.407	0.000	128.407	
Total Adjustments	-5.233	0.000	1.163	0.000	1.163	
• 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	-2.420	0.000				
• Other Adjustments	-2.813	0.000	1.163	0.000	1.163	
Change Summary Explanation						
In FY 2024, decrease of 2.813 million in Other Adjustments was to align programming to actual execution.						
The FY 2026 request was reduced by 0.057 million for Advisory and Assistance Services to promote efficiencies and advance the policies of the Administration in alignment with Executive Order 14222, "Implementing the President's Department of Government Efficiency Cost Efficiency Initiative."						
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2024	FY 2025	FY 2026
Title: Aeroshell Technologies				29.068	48.413	60.512
Description: Develop advanced aeroshell flight dynamics hardware, software, and material manufacturing technologies critical to nuclear re-entry system flight testing in relevant and representative environments.						
FY 2025 Plans:						
- Continue advancing Modeling & Simulation tools for predicting nuclear re-entry environments to accurately predict aeroshell flight dynamics associated with nuclear re-entry system environments. (This work relies on PE 0602201F foundational computational efforts)						
- Initiate the coupling of software and hardware developments for near-future Government Reference Design testing.						
- Continue advanced Modeling & Simulation characterization of nuclear system re-entry environments and update the integrated platforms by including an advanced physics-based re-entry characterization protocol to decrease computational expense.						

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I</i> BA 3: <i>Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603273F <i>I Science & Technology for Nuclear Re-entry Systems</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Continue laboratory experimentation code validation to increase confidence in nuclear re-entry system environmental predictions. - Continue aeroshell materials parametric studies, procuring material samples, iterating material characterization, and laboratory experimentation to update nuclear re-entry system materials database. - Complete supplemental material development for future laboratory experimentation. - Continue identifying material requirements through experimentation and integrate data into computational models to evaluate combined environment effects. - Initiate planning for combined environment effects testing. - Continue developing a Government Reference Design platform by identifying requirements with continued design trade studies and optimization. - Continue manufacturing process trade studies and analyses, as well as a model-based systems engineering for future Government Reference Design risk reduction. - Continue investigating sourcing options for outer aeroshell materials and high-temperature Government Reference Design components. - Continue refining requirements supporting component integration into future launch platforms. - Continue requisite test-bed design trades and/or modifications, including instrumentation options for future flight characterization and analysis capabilities. - Initiate future Government Reference Design integration, test, and evaluation planning. FY 2026 Plans: - Continue developing enhanced aeroshell modeling tools to simulate nuclear system re-entry environments and support near-future Government Reference Design testing capabilities. (This work relies on PE 0602201F foundational computational efforts). - Continue the coupling of software and hardware developments for near-future Government Reference Design testing. - Continue the computational characterization of nuclear re-entry system environments and update integrated solvers for enhanced analysis workflow. Enhancements will include an advanced physics-based re-entry characterization algorithm to help decrease computational expense. - Continue laboratory experimentation code validation to increase confidence in nuclear re-entry system environmental predictions. - Continue procuring material samples and laboratory experimentation to systematically supplement existing nuclear re-entry system materials databases. - Continue computational material requirement studies to predict combined environment effects. - Continue test planning for a combined environment effects test campaign to evaluate materials performance in relevant combined environments.				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603273F <i>I Science & Technology for Nuclear Re-entry Systems</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Continue development of high lateral acceleration (high-g) and boost glide Government Reference Design platforms through requirements identification and continued design trade studies and optimization. - Continue manufacturing process trade studies and analyses, as well as model-based systems engineering for risk reduction in future Government Reference Designs development. - Continue investigations into sourcing options for outer aeroshell materials and high-temperature Government Reference Design components. - Continue requirements identification for component integration into multiple-use future launch platforms. - Continue requisite test-bed design trades and/or modifications, including instrumentation options for future flight characterizations and analysis capabilities. - Continue planning for future Government Reference Design integration, test, and evaluation. - Initiate mature design trades for required test-bed designs and modifications, including evaluation of instrumentation options for future flight characterization and analysis requirements. - Initiate trade studies for novel fabrication processes for nose tips, leading edges, and control surfaces. - Initiate purchases of long lead items, including Thermal Protection Systems, for foundational construction of long-glide and high lateral acceleration (high-g) Government Reference Vehicles. - Complete the initial long-glide Government Reference Design and begin constructing the first Government Reference Vehicle for near-future flight experiment. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$12.099 million to support efforts for a high lateral acceleration (high-g) Government Reference Concept in addition to a boost glide Government Reference Design. Multiple Government Reference Designs are required to meet strategic re-entry environment requirements and achieve Technology Readiness Level 6 through flight tests of the Government Reference Vehicles for transition. These requirements multiply the requisite work while enabling strategic partnering for reduced development costs. Further, Thermal Protection System technologies for multiple vehicles, as well as additional manpower resourcing, are required to meet the 25-year roadmap, thus increasing costs to this effort.				
Title: Advanced Fuzing Technologies Description: Develop Next Generation fuzing solutions that maintain operational effectiveness against emerging targeting challenges, improve reliability on non-ballistic nuclear re-entry vehicles, and develop alternative safety and surety features required for nuclear systems. FY 2025 Plans: - Continue developing advanced fuzing solutions to improve reliability and accuracy for non-ballistic nuclear re-entry vehicles. - Continue developing integrated guidance/fuzing solutions and complete evaluating advanced fuzing requirements.		1.082	1.429	2.560

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603273F <i>I Science & Technology for Nuclear Re-entry Systems</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Continue developing experimental impact fuze technologies to ensure proper system execution for varying scenario target impacts. - Continue advanced impact fuze P0 for testing and begin identifying early integration opportunities. - Continue prototype fuze development through design, construction, and preliminary testing. - Initiate integration planning of advanced guidance with fuzing architecture and target optimization algorithms. FY 2026 Plans: - Continue developing advanced fuzing solutions to improve reliability and accuracy for non-ballistic nuclear re-entry vehicles. - Continue developing integrated guidance/fuzing solutions and complete evaluating advanced fuzing requirements. - Continue developing experimental impact fuze technologies to ensure proper system execution for varying scenario target impacts and identification of early integration opportunities. - Continue prototype development through design, construction, and preliminary testing. - Continue integration planning of advanced guidance systems with fuzing architecture and target optimization algorithms. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$1.131 million from FY 2025 to FY 2026 to enable the integration of fuze articles in Government Reference Design testbeds.				
Title: Advanced Guidance, Navigation and Control (GNC) Technologies Description: Develop Next Generation strategic level, radiation-hardened Guidance, Navigation, and Control technologies and solutions. These technologies include sensors, navigational systems, aides, and control elements to support Guidance, Navigation, and Control requirements for relevant nuclear re-entry system environments. FY 2025 Plans: - Continue strategic-grade, solid-state radiation-hardened guidance development and radiation component testing. - Continue designing high lateral acceleration (high-g) Application Specific Integration Circuits accelerometer - Initiate plans for delivering a solid-state, high lateral acceleration (high-g) accelerometer for advanced technological development characterization and for insertion into Inertial Measurement Unit future architecture. - Continue laboratory experimentation of Resonant Fiber Optic Gyroscope (including multiple component level design, testing, and experimentation) to inform the iterative development of ensuing Resonant Fiber Optic Gyroscope design. - Continue final Resonant Fiber Optic Gyroscope design trade studies and develop mechanical flight architecture. - Continue risk reduction evaluation of Resonant Fiber Optic Gyroscope components, including fiber improvement, radiation-hardened component development, and light source performance. - Continue Inertial Measurement Unit development and maturation through the design, construction, and environmental testing of inertial sensor components.		22.889	18.803	22.537

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I</i> BA 3: <i>Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603273F <i>I Science & Technology for Nuclear Re-entry Systems</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Continue purchasing of long-lead Inertial Measurement Unit components and continue bench-level characterization for Inertial Measurement Unit system with early sensor designs. - Continue Inertial Measurement Unit radiation-hardening electronics design, construction, and risk reduction analysis to ensure progressive evaluation. - Initiate covariance analysis improvement using sensor/system test data to predict Inertial Measurement Unit performance. - Complete requirement identification supporting inertial sensor component integration for future re-entry system testbed flight. - Initiate final design of strategic-grade, radiation-hardened gyroscope for FY 2026 insertion into Inertial Measurement Unit, as well as design future inertial sensor for quantum Inertial Measurement Units. FY 2026 Plans: - Continue strategic-grade, solid-state radiation-hardened guidance solution development and radiation component testing. - Complete designing high lateral acceleration (high-g) accelerometer Application Specific Integration Circuits. - Continue plans for delivering a solid-state, high lateral acceleration (high-g) accelerometer for insertion into Inertial Measurement Unit future architecture. - Complete design and initiate build of solid, state, low-g accelerometer with integrated Application Specific Integration for insertion into Inertial Measurement Unit future architecture. - Continue laboratory experimentation of Resonant Fiber Optic Gyroscope electrical and optical components to inform the iterative development of ensuing Resonant Fiber Optic Gyroscope design. - Continue final Resonant Fiber Optic Gyroscope design trade studies and develop mechanical flight architecture. - Continue risk reduction evaluation of Resonant Fiber Optic Gyroscope components, including fiber improvement, radiation-hardened component development, and light source performance. - Continue Inertial Measurement Unit development and maturation through the design, construction, and environmental testing of inertial sensor components. - Continue purchasing of long-lead Inertial Measurement Unit components and continue bench-level characterization for Inertial Measurement Unit system with maturing sensor designs. - Continue Inertial Measurement Unit radiation-hardening electronics design, construction, and risk reduction analysis to ensure progressive evaluation. - Continue covariance analysis improvement through sensor/system test data inputs to predict Inertial Measurement Unit performance. - Complete delivery of initial prototype testbed Resonant Fiber Optic Gyroscope for insertion into Inertial Measurement Unit demonstrator. - Initiate design of next Resonant Fiber Optic Gyroscope prototype iteration for future insertion into Inertial Measurement Unit flight prototype unit. FY 2025 to FY 2026 Increase/Decrease Statement:				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603273F <i>I Science & Technology for Nuclear Re-entry Systems</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
FY 2026 increased compared to FY 2025 by \$3.734 million to support plans for increased requirements to facilitate delivery of the initial prototype resonant fiber optic gyroscope for Inertial Measurement Unit prototype integration for functional testing and experimentation.				
Title: Integration, Experimentation, and Evaluation Solutions		12.049	23.240	42.798
Description: Development of specialized nuclear re-entry system expertise and infrastructure through integration and experimentation efforts. This effort supports current and future nuclear re-entry systems development and component Technology Readiness Level maturation through Government Reference Design characterizations in laboratory environments representative of relevant and representative environments.				
FY 2025 Plans: - Continue establishing the necessary testing infrastructure and experimental capabilities to enable nuclear re-entry system technology engineering and demonstration, and to evaluate components in relevant environments. - Continue procurement of long-lead time special equipment for installation into government integration facilities. - Initiate construction of the Re-entry Vehicle Integration Laboratory, which will support integration of strategic technologies and testbeds. - Initiate significant manpower increase to support Initial Operating Capability of government integration facility. - Initiate accreditation and certification processes for the Re-entry Vehicle Integration Laboratory infrastructure, personnel, and equipment. - Initiate planning and design of radiographic facility to support the imaging and evaluation during high-fidelity demonstrations. - Initiate procurement planning of long-lead time radiographic test equipment for installation into radiographic facility. - Initiate planning and design of high lateral acceleration (high-g), high-precision centrifuge. - Continue developing enhanced ground and complementary experimentation capabilities and establish supporting strategic-grade inertial sensor characterization and validation to meet Guidance, Navigation, and Control analytic activities for future flights to achieve Inertial Measurement Unit Technology Readiness Level 6. - Continue developing a recoverable re-entry testbed platform supporting Modeling & Simulation validation and component Technology Readiness Level maturation through interim design review. - Continue the integration planning for recoverable re-entry testbeds and flight tests for strategic-grade Inertial Measurement Units. - Continue developing enhanced ground and complementary experimentation capabilities for nuclear re-entry system environments - Continue functional requirements development to establish an integration strategy and a proposed test plan in relation to Guidance, Navigation, and Control technologies, Aeroshell technologies, fuzing technologies, and telemetry for future flights. - Continue planning and developing requirements for enduring Government Reference Design flights.				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603273F <i>I Science & Technology for Nuclear Re-entry Systems</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Initiate planning with Government Reference Design delivery system developer and launch facility coordinator. FY 2026 Plans: - Continue establishing the requisite testing infrastructure to enable nuclear re-entry system science and technology development activities and to evaluate components technologies in relevant environments. - Continue procurement of long-lead time special equipment for installation into government integration facilities. - Continue manpower increase to support Initial Operating Capability of government integration facility. - Continue accreditation and certification processes for Re-entry Vehicle Integration Laboratory infrastructure, personnel, and equipment. - Complete construction of the Re-entry Vehicle Integration Laboratory, which will support integration of strategic technologies and testbeds. - Continue construction design of radiographic facility to support imaging and evaluation for high-fidelity demonstrations. - Continue procurement planning of long-lead time radiographic test equipment for installation into radiographic facility. - Initiate design architecture, engineering logistics, and construction planning for the nuclear modeling and simulation capabilities facility. - Continue planning and design of high lateral acceleration (high-g), high-precision centrifuge to align with construction deliverables. - Continue developing enhanced ground and complementary experimentation capabilities and establish supporting strategic-grade inertial sensor characterization and validation to meet Guidance, Navigation, and Control analytic activities for future flights to achieve Inertial Measurement Unit Technology Readiness Level 6. - Continue integration planning for recoverable re-entry testbeds across multiple experimental payloads. - Continue developing functional requirements to establish an integration strategy and a proposed test plan for Guidance, Navigation, and Control technologies, Aeroshell technologies, fuzing technologies, and telemetry for future flights. - Continue planning and developing requirements for enduring Government Reference Design flights. - Continue planning with Government Reference Design delivery system developer and launch facility coordinator. - Continue the development of a reentry testbed supporting Modeling & Simulation validation and Technology Readiness Level maturation for nuclear re-entry system components and materials. - Continue use of test bed for enduring flight experimentation. - Continue planning and designs for a reliable set of sub-scale, dual-use nuclear reentry system flight experiment platforms. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$19.588 million to facilitate acquisition of the resources necessary to modernize nuclear science & technology expertise and infrastructure in alignment with the joint 25-year roadmap. This increase includes				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)					R-1 Program Element (Number/Name) PE 0603273F I Science & Technology for Nuclear Re-entry Systems							
C. Accomplishments/Planned Programs (\$ in Millions)										FY 2024	FY 2025	FY 2026
planning activities for long-lead procurements of radiographic test equipment and the design architecture, construction planning for the nuclear modeling and simulation capabilities facility, and related engineering activities supporting these efforts.												
Accomplishments/Planned Programs Subtotals										65.088	91.885	128.407
D. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost	
• RDTE 03 0603211F: Aerospace Technology Dev/Demo	88.628	0.000	0.000	-	0.000	-	-	-	-	-	-	
• RDTE 02 0602201F: Aerospace Vehicle Technologies	12.922	15.235	0.000	-	0.000	-	-	-	-	-	-	
• RDTE 02 0602336F: Nuclear Delivery Systems Tech Exploration	0.000	0.000	4.969	-	4.969	-	-	-	-	-	-	
Remarks												
E. Acquisition Strategy												
Not applicable												

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force	Date: June 2025

Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>	PE 0603444F I <i>Maui Space Surveillance System (MSSS)</i>											
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
Total Program Element	0.000	0.002	0.000	0.000	0.000	0.000	-	-	-	-	-	-
634868: <i>Maui Space Surveillance System</i>	0.000	0.002	0.000	0.000	0.000	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

not applicable

A. Mission Description and Budget Item Justification

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

This program element may include necessary expenses to support the operation and maintenance of facilities to manage, execute, and deliver science and technology capabilities.

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

B. Program Change Summary (\$ in Millions)	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Previous President's Budget	0.002	0.000	0.000	0.000	0.000
Current President's Budget	0.002	0.000	0.000	0.000	0.000
Total Adjustments	0.000	0.000	0.000	0.000	0.000
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)		R-1 Program Element (Number/Name) PE 0603444F I Maui Space Surveillance System (MSSS)		
Change Summary Explanation Not applicable				
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
Title: Operate and Upgrade Maui Space Surveillance System		0.002	-	-
Description: Operate and upgrade the Maui Space Surveillance System to support development, demonstration, and integration of ground-based optical space situational awareness technologies.				
Accomplishments/Planned Programs Subtotals		0.002	-	-
D. Other Program Funding Summary (\$ in Millions) N/A				
Remarks Not Applicable				
E. Acquisition Strategy Not applicable				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force	Date: June 2025

Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>	PE 0603456F I <i>Human Effectiveness Advanced Technology Development</i>											
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
Total Program Element	0.000	39.929	14.608	19.790	0.000	19.790	-	-	-	-	-	-
635323: <i>Directed Energy Bioeffects Parameters</i>	0.000	16.037	6.316	4.960	0.000	4.960	-	-	-	-	-	-
635324: <i>Biosciences Performance Demonstration</i>	0.000	3.273	2.979	4.218	0.000	4.218	-	-	-	-	-	-
635325: <i>Mission Effective Performance</i>	0.000	3.917	3.922	6.159	0.000	6.159	-	-	-	-	-	-
635327: <i>Warfighter Interfaces</i>	0.000	16.702	1.391	4.453	0.000	4.453	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This program develops, demonstrates, and transitions technologies to enhance Airman performance and effectiveness. State-of-the-science advances are made in warfighter training, warfighter system interfaces, directed energy bioeffects, deployment and sustainment of warfighters in extreme environments, and understanding and shaping adversarial behavior. The Directed Energy Bioeffects Parameters project develops, demonstrates, and transitions technologies to predict, evaluate, and mitigate the effects of directed energy on personnel and mission performance, and exploits the offensive capabilities of directed energy systems. The Biosciences Performance Demonstration project develops, demonstrates, and transitions technologies to sustain airman performance in adverse operational and/or training environments, monitor and mitigate in-flight unexplained physiological events, and prevent human performance related mishaps through real-time monitoring and mitigation—particularly through highly automated or autonomous systems. The Mission Effective Performance project develops, demonstrates, and transitions advanced training, simulation, mission rehearsal, and other performance-aiding methods and technologies to enhance warfighter readiness. The Warfighter Interfaces project develops, demonstrates, and transitions technologies to revolutionize the way Airmen and Guardians synergistically use Department of the Air Force combat and combat support systems, including autonomous machines and adaptive teams of Airmen, Guardians, and machines. Efforts in this program have been coordinated through the Department of Defense (DoD) Science and Technology (S&T) Executive Committee process to harmonize efforts and eliminate duplication.

The Air Force Research Laboratory (AFRL) is focused on high-impact, multi-domain science & technology (S&T) solutions that drive innovation now while laying the groundwork for the Air and Space Force to win the future fight. AFRL effectively synchronizes the Department of the Air Force (DAF) S&T enterprise and workforce to align towards the most consequential DAF priorities and accelerate the delivery of game-changing S&T.

This program element may include necessary expenses to support the operation and maintenance of facilities to manage, execute, and deliver science and technology capabilities.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force				Date: June 2025		
Appropriation/Budget Activity		R-1 Program Element (Number/Name)				
3600: Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)		PE 0603456F I Human Effectiveness Advanced Technology Development				
B. Program Change Summary (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Previous President's Budget		15.593	19.568	19.849	0.000	19.849
Current President's Budget		39.929	14.608	19.790	0.000	19.790
Total Adjustments		24.336	-4.960	-0.059	0.000	-0.059
• Congressional General Reductions		0.000	0.000			
• Congressional Directed Reductions		0.000	-4.960			
• Congressional Rescissions		0.000	0.000			
• Congressional Adds		27.000	0.000			
• Congressional Directed Transfers		-0.812	0.000			
• Reprogrammings		0.000	0.000			
• SBIR/STTR Transfer		-1.261	0.000			
• Other Adjustments		-0.591	0.000	-0.059	0.000	-0.059
Congressional Add Details (\$ in Millions, and Includes General Reductions)						
Project: 635323: Directed Energy Bioeffects Parameters						
Congressional Add: Airborne Augmented Reality for Increased Pilot Training Production						
Congressional Add Subtotals for Project: 635323						
Project: 635324: Biosciences Performance Demonstration						
Congressional Add: Critical Care Air Transport Teams						
Congressional Add Subtotals for Project: 635324						
Project: 635327: Warfighter Interfaces						
Congressional Add: Automated geospatial intelligence algorithms						
Congressional Add: Tactical Personal Area Network						
Congressional Add Subtotals for Project: 635327						
Congressional Add Totals for all Projects						

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 3					R-1 Program Element (Number/Name) PE 0603456F / Human Effectiveness Advanced Technology Development				Project (Number/Name) 635323 / Directed Energy Bioeffects Parameters			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
635323: Directed Energy Bioeffects Parameters	0.000	16.037	6.316	4.960	0.000	4.960	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops, demonstrates, and transitions technologies to predict, evaluate, and mitigate the effects of novel weapon systems on personnel and mission performance, and exploits the offensive capabilities of directed energy systems. This project develops the human components of the guidelines for testing, deployment, and protection from high-power microwave and high-energy laser systems and uses this information to develop technology to protect warfighters from directed energy weapon systems use and effects. This project also develops tools and plug-ins that enhance mission and engagement models, provide predictive risk analysis for deployment of Directed Energy (DE) systems, and analyzes DE systems for military use. Additionally, this project develops tools and analysis techniques for counter directed energy weapon technologies. The effort also develops modeling and simulation tools to unite bioeffects and human performance models from across the Department of the Air Force in support of Digital Transformation initiatives.

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

	FY 2024	FY 2025	FY 2026
Title: Directed Energy Bioeffects	6.363	6.316	4.960
Description: Develops, demonstrates, and transitions directed energy modeling simulation and analysis to support both radio-frequency and laser bioeffects advanced demonstrations. Develop and demonstrate modeling capabilities to assess collateral hazards from high power directed energy systems, including the use of probabilistic risk assessment techniques and analysis of system-level effects on warfighters. Also develop and demonstrate counter directed energy weapons technologies for aircrew and ground personnel to provide protection against directed energy threats. The project integrates bioeffects and human performance models from across the Department of the Air Force in support of Digital Transformation initiatives.			
FY 2025 Plans: - Continue to provide hazard analysis for directed energy and novel weapon systems under development, demonstrating new validated capabilities for personnel hazard assessments. - Continue to demonstrate and integrate high peak power radio frequency and laser human effects assessment models and tools to address real world concerns. - Continue to provide human-based design requirements optimizing operational and mission performance for counter-directed energy weapon technologies. - Continue the integration of radio frequency and optical radiation hazards and behavioral analysis into engagement-level modeling, simulation, and analysis tools for future transitions in mission-level tool suites to support formal studies and analyses.			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 3		R-1 Program Element (Number/Name) PE 0603456F / Human Effectiveness Advanced Technology Development		Project (Number/Name) 635323 / Directed Energy Bioeffects Parameters	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
- Continue development of integrated vision modeling libraries to optimize agile laser eye protection technologies. Integrate modeling and simulation capabilities into existing architectures for weaponeering and mission level analyses to enable holistic human performance modeling. - Continue Agile Laser Eye Protection analysis tool to develop and deliver an integrated modeling environment for optimizing devices for protecting eyes against optical radiation and mitigating the visual impact of those devices on airman interfaces, visual performance & operational effectiveness. - Complete directed energy human effects modules for wargaming scenarios and weaponeering tools. - Initiate Virtual Reality component for vision effects (Glare/Dazzle) through transition of laser dazzle simulations into operational applications. - Initiate development of library of Model-based Systems Engineering and constructive modules for building human digital twins and vulnerability models for host simulation environments, mission level models and wargame toolsets. FY 2026 Plans: - Complete the Virtual Reality component for vision effects (Glare/Dazzle) through transition of laser dazzle simulations into operational applications. Specific activities within this FY include development and testing of plug-ins of Bioeffects models, and work with the Air Force Research Laboratory (AFRL) Directed Energy Directorate to integrate them into Wargaming and Advanced Research Simulation laboratory. - Continue to provide hazard analysis for directed energy and novel weapon systems under development, demonstrating new validated capabilities for personnel hazard assessments. Specific activities within this FY include conducting Bidirectional Reflectance Distribution Function Measurements and analysis to support the required Directed Energy Weapon Review and Approval Process (DEWRAP) for novel laser systems and applications, which aligns to Directed Energy Roadmap of the Office of the Under Secretary of Defense for Research and Engineering. - Continue to provide human-based design requirements optimizing operational and mission performance for counter-directed energy weapon technologies. Specific activities within this FY include providing subject matter expertise and modeling & simulation analysis supporting the Engineering Management and Development process of Nuclear Flash Blindness Protection program, and the Aircrew Laser Eye Protection Block 3 development program for the Air Force Life Cycle Management Center Agile Combat Support Directorate. - Continue to demonstrate and integrate high peak power radio frequency and laser human effects assessment models and tools to address real world concerns. Specific activities within this FY include modeling and simulation analysis and providing subject matter expertise for American National Standards Institute (ANSI) Laser Safety Standards, and Radio Frequency Standards development and North Atlantic Treaty Organization laser dazzle Standard Recommendations; validating radio frequency directed energy bioeffect weapons within virtual and constructive environments, integrating Directed Energy propagators into the Radiometry plug-in, and transitioning simulation and modeling plugins to the AFRL Aerospace Systems Directorate.					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 3		R-1 Program Element (Number/Name) PE 0603456F / <i>Human Effectiveness Advanced Technology Development</i>		Project (Number/Name) 635323 / <i>Directed Energy Bioeffects Parameters</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
- Continue the integration of radio frequency and optical radiation hazards and behavioral analysis into engagement-level modeling, simulation and analysis tools for future transitions in mission-level tool suites to support formal studies and analyses. Specific activities within this FY include developing a Radiofrequency Propagator, integrating it into Air Force Targeting Effects Software - Exploratory (AFTES-X), and developing radio frequency scenarios; developing risk-based features for integration of directed energy weapons parameters in engagement-level weaponeering tools, to facilitate integration of advanced radiometrics, and multi-domain target models; developing a High Energy Laser air-to-ground scenario, using Human Common Target Model for Directed Energy engagement modeling; and transitioning plugins to the Air Force Life Cycle Management Center (AFLCMC) Armament Directorate. - Continue development of integrated vision modeling libraries to optimize agile laser eye protection technologies. Integrate modeling and simulation capabilities into existing architectures for weaponeering and mission level analyses to enable holistic human performance modeling. Specific activities within this FY include completing a version of the Agile Laser Eye Protection Analysis Tool (ALAT) with a photostress recovery model, and demonstrating the ALAT tool to the Air Force Research Laboratory Materials and Manufacturing Directorate. - Continue development of the ALAT to produce an integrated modeling environment for optimizing devices to protect eyes against optical radiation, and to mitigate the visual impact of optical radiation on airman-machine interfaces, visual performance, and operational effectiveness. Specific activities within this FY include completing a version of the ALAT which integrates characterization of Laser Eye Protection filters, verifying this version with LEP Data, and then demonstrating the verified ALAT tool to the AFLCMC Agile Combat Support Directorate. - Continue the environment validation phase of operational reference mission analysis of directed energy collateral effects at advanced technology class of targets, enabling mid-term employment of directed energy weapons. Specific activities within this FY include delivering an updated tool for performing probabilistic/deterministic laser risk assessment of airborne laser target designators, and completing general software tool updates to the Military Advanced Technology Integrated Laser Hazard Assessment (MATILDA) model based on user community feedback to support the F-35 Joint Program Office and an United Kingdom Project Agreement. FY 2025 to FY 2026 Increase/Decrease Statement: FY2026 decreased compared to FY2025 by \$1.356 million due to due to completion of Directed Energy human effects modules for wargaming and weaponeering tools, and transition of modules and tools to the Air Force Life Cycle Management Center, the Air Force Operational Test and Evaluation Center, Air Combat Command, Naval Air Systems Command; and slowing development of Human Digital Twins.					
Accomplishments/Planned Programs Subtotals			6.363	6.316	4.960
			FY 2024	FY 2025	
Congressional Add: Airborne Augmented Reality for Increased Pilot Training Production			9.674	-	

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603456F / Human Effectiveness Advanced Technology Development	Project (Number/Name) 635323 / Directed Energy Bioeffects Parameters
	FY 2024	FY 2025
FY 2024 Accomplishments: Conduct Congressionally directed research		
Congressional Adds Subtotals	9.674	-
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks Airman Augmented Reality for Increased Pilot Training Production Congressional Add is now being executed out of Project 635325 Mission Effective Performance		
D. Acquisition Strategy Not applicable		

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 3					R-1 Program Element (Number/Name) PE 0603456F / Human Effectiveness Advanced Technology Development				Project (Number/Name) 635324 / Biosciences Performance Demonstration			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
635324: Biosciences Performance Demonstration	0.000	3.273	2.979	4.218	0.000	4.218	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project objectives are: Develop, demonstrate, and transition products that provide Airman and Guardian-integrated capabilities to sustain, enhance, and augment airmen physical and cognitive performance under challenging and adverse operational and training mission environments. Integrate technical advances in molecular and synthetic biology, multi-omics, cognitive performance optimization, brain-machine interface, and application of non-invasive physiological and cognitive performance monitoring devices. Develop solutions to sense, assess, and mitigate impacts to airmen performance degradation including, but not limited to, unexplained physiological events, fatigue, injury, stressors (i.e. environmental, occupational, personal), and cognitive overload. Develop and demonstrate technologies to enhance and accelerate individual physical and cognitive ability to rapidly learn and acquire new mission skills and maintain proficiency of acquired skills. Mature technologies to provide commanders real time status monitoring and assessment of individual's mission ready status and intervention protocols to accelerate restoral to combat readiness.

In FY 2025 this Project changed its name from "Human Dynamics and Terrain Demonstration" to "Biosciences Performance Demonstration".

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

	FY 2024	FY 2025	FY 2026
Title: Biotechnology for Performance Research and Demonstration	0.325	2.979	4.218
Description: Develop and demonstrate advanced prototype products that provide Airman-integrated technologies providing decision advantage and enable Airman performance under cognitive and physiological stressors associated with prolonged, high tempo, and demanding mission scenarios as well as stressors associated with operations in adverse environments (i.e. high altitude, Arctic). Provide technology to real-time assess the physical and cognitive state of Airmen and provide feedback and intervention capabilities to restore and enhance Airmen performance. This leverages cutting-edge biosensors, bioinformatics, and artificial intelligence technology to enable faster and more effective performance interventions for the modern warfighter.			
FY 2025 Plans: - Continue system development of a fatigue management system, Fatigue Optimized Cognition Under Stress. - Continue to refine the eye tracking-based fatigue assessment algorithm. - Continue integrating eye tracking-based fatigue assessment algorithm with the mobile/console mission application software. - Continue development of a secure, cloud-based data managements system to collect and analyze in-flight human performance physiologic data.			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 3		R-1 Program Element (Number/Name) PE 0603456F / <i>Human Effectiveness Advanced Technology Development</i>		Project (Number/Name) 635324 / <i>Biosciences Performance Demonstration</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
- Initiate lab validation study of an initial eye tracking fatigue algorithm and a non-invasive form of neuromodulation, transcutaneous vagal nerve stimulation, as a counter-measure intervention for fatigue symptoms. FY 2026 Plans: - Complete integrating an eye tracking-based fatigue assessment algorithm with the mobile/console mission application software. Specific activities within this FY included integrating, field-testing, and final assessment of the eye tracking-based fatigue assessment algorithm within mobile/console mission application software; and transition the software for integration into Command and Control, Air Battle Management, and aircraft cockpit simulators. - Complete development of a secure, cloud-based data management system to collect and analyze in-flight human performance physiologic data. Establish a long-term repository of pilot performance and exposures data, as well as an Artificial Intelligence-ready data set for future performance state modeling; and demonstrate the data management system to the Air Combat Command Plans, Programs and Requirements Directorate, the Air Force Life Cycle Management Center Agile Combat Support Directorate, and the Joint Program Office for Chemical, Biological, Radiological and Nuclear Defense. - Complete a lab validation study of an initial eye tracking fatigue algorithm and a non-invasive form of neuromodulation, transcutaneous vagal nerve stimulation (tvNS), as a counter-measure intervention for fatigue . Specific activities include demonstration of fully automated and close-looped capability in an operationally relevant simulation environment. - Continue system development of a fatigue management system, Fatigue Optimized Cognition Under Stress (FOCUS). Specific activities within this FY include demonstration of system effectiveness predicting and managing performance fatigue during maximum endurance operations for aircrew; extending in-flight physiological cockpit sensing capabilities to assess transient and subtle changes in performance states (e.g., fatigued, distracted, full capacity) during flight, support after-action reviews, and enhance future human-machine teaming; and developing personalized countermeasure prescriptions. - Initiate a flight-test demonstration of neural stimulation (tvNS) to counteract Airman fatigue, preparing for transition to Department of Defense use. Specific activities within this FY include airworthiness determination and flight testing to demonstrate performance improvement effects. - Initiate development of a prototype system to assess and predict the physio-cognitive state of pilots operating in a combat environment commanding autonomous assets; executing both high-altitude chamber and centrifuge testing to gauge human suitability for the prototype supporting multi-autonomous collaborative platform control. Specific activities within this FY include system engineering analysis, and integration of the sensor system with existing in-lab flight simulators as a proof-of-concept demonstration. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$1.239 million due to increased interest in research related to collaborative combat aircraft, including predicting and managing pilot fatigue during CCA missions, proof of concept demonstration of					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603456F / <i>Human Effectiveness Advanced Technology Development</i>	Project (Number/Name) 635324 / <i>Biosciences Performance Demonstration</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
assessment of the physio-cognitive state of pilots while interacting with multiple autonomous collaborative aircraft, and flight testing transcutaneous Vagal Nerve Stimulation technology.			
Accomplishments/Planned Programs Subtotals		0.325	2.979
		FY 2024	FY 2025
Congressional Add: Critical Care Air Transport Teams		2.948	-
FY 2024 Accomplishments: Conduct Congressionally directed research			
Congressional Adds Subtotals		2.948	-
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
Not applicable			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 3					R-1 Program Element (Number/Name) PE 0603456F / Human Effectiveness Advanced Technology Development				Project (Number/Name) 635325 / Mission Effective Performance			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
635325: Mission Effective Performance	0.000	3.917	3.922	6.159	0.000	6.159	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops, demonstrates, and transitions advanced training, simulation, mission rehearsal, and other performance-aiding methods and technologies to enhance warfighter readiness. This project also develops advanced methods and technologies to enable interactive Live-Virtual-Constructive blended environments for performance-aiding methods and technologies. Focus areas include integrated high-fidelity weapon systems training technologies for air, space, and cyber missions; tailored immersive simulation environments for airmen at the tactical and operational levels; and incorporation of performance assessment and feedback tools. These methods and technologies facilitate the development of mission-essential competencies across the broad range of Air Force mission areas. Technology areas are focused on the Combat Air Force (CAF) with major benefits to Joint and coalition partner training needs.

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

	FY 2024	FY 2025	FY 2026
Title: Readiness Technology Development	3.917	3.922	6.159
Description: Develops, demonstrates, and transitions technology for a secure, persistent, and standardized blended live-virtual-constructive operational test and training enterprise. Utilize modeling capabilities for technology demonstration efforts focused on developing software-based tools for managing training, tracking proficiency and readiness; and for training that would replace the human as adversaries and instructors.			
FY 2025 Plans: - Complete using encrypted data specifications as part of the migration and integration of those data into an operational readiness data with user-specified data extraction and reporting formats. - Complete integration of readiness measurement tools in all current training and readiness environments, to include augmented and virtual reality, part-task, full fidelity simulators, the Joint Simulation Environment, and operational range infrastructure. - Complete evaluations of higher fidelity software agent models integrated with live and virtual systems and their impact on the quality of training and exercise for a peer fight. - Continue work to integrate, evaluate, and demonstrate technologies to support multi-capable airmen with just-in-time-training and readiness support in deployed and austere mission contexts and locations. - Continue work integrating training management and data tracking tools and interfaces into the Synthetic Operational Test and Training Infrastructure. Continue field evaluations connecting big data and proficiency-based training infrastructure with operational event-based tracking and reporting systems.			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 3		R-1 Program Element (Number/Name) PE 0603456F / <i>Human Effectiveness Advanced Technology Development</i>		Project (Number/Name) 635325 / <i>Mission Effective Performance</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
- Continue systematic evaluations of proficiency-based live-virtual-constructive on operational readiness and more optimal mixes of live and virtual training and exercise. Initiate demonstrations of secure fighter integration blended training events in both research and operational locations, including The FVEY coalition partner venues. - Continue work to integrate Distributed Mission operations-and Joint Simulation Environment-based architectures to support interoperable, peer-level training and rehearsal across 4th, 5th, and beyond generation mission sets. - Initiate Modeling and Simulation Integration Lab innovation integration work supporting the Effects Based Simulator and Joint Simulation Environment advancements. - Initiate Effects Based Simulator and Joint Simulation Environment integration and interoperability development supporting Synthetic Operational Test and Training for Command, Control, Communications and Battle Management. FY 2026 Plans: - Complete evaluations of higher fidelity software agent models integrated with live and virtual systems, and their impact on the quality of training and exercises for a peer fight. Specific activities within this FY include incorporating Autonomous Collaborative Platform models into virtual simulation testbeds, for warfighter evaluation from operational effectiveness and training perspectives relative to a peer fight; and reporting the findings to the Air Combat Command (ACC) Plans, Programs, and Requirements Directorate; and the ACC Air and Space Operations Directorate. - Continue work to integrate, evaluate, and demonstrate technologies to support multi-capable airmen with just-in-time-training and readiness support in deployed and austere mission contexts and locations. Specific activities within this FY include continuing development of added capability and footprint reduction, and demonstration of just-in-time-training capability at exercise Northern Strike 25-2. - Continue work integrating training management and data tracking tools and interfaces into the Synthetic Operational Test and Training Infrastructure. Specific activities within this FY include expanding and extending training management and data tracking tool capabilities to the Distributed Training Center (DTC), the Distributed Mission Operations Center (DMOC), and the Live Mission Operation Capability (LMOC). - Continue field evaluations connecting big data and proficiency-based training infrastructure with operational event-based tracking and reporting systems. Specific activities within this FY include adding proficiency-based training hardware and software to locations including the DTC, the DMOC, and the LMOC, and conducting field evaluations of capability effectiveness. - Continue systematic evaluations of proficiency-based live-virtual-constructive technology on operational readiness, and more optimal mixes of live and virtual training and exercises. Specific activities within this FY include deploying SimMD (a tool that evaluates simulator fidelity, ensuring training environments match high-fidelity scenarios) to multiple Distributed Mission Operation (DMO) training locations, and using analysis and findings to guide optimal simulator/scenario combinations. - Continue work to integrate Distributed Mission Operations (DMO) and Joint Simulation Environment (JSE) based architectures to support interoperable, peer-level training and rehearsal across 4th, 5th, and next generation mission sets. Specific activities within this FY include research and development of DMO and JSE architecture mechanisms for interoperability to support the Air					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603456F / <i>Human Effectiveness Advanced Technology Development</i>	Project (Number/Name) 635325 / <i>Mission Effective Performance</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
Combat Command (ACC) Plans, Programs, and Requirements Directorate, and Air Force Life Cycle Management Center Agile Combat Support Directorate goals in Air Force Research Laboratory (AFRL) testbeds. - Continue Modeling and Simulation Integration Lab (MSIL) innovation integration work supporting the Effects Based Simulator (EBS) and Joint Simulation Environment advancements. Specific activities within this FY include capability development and testing with JSE in AFRL testbeds to support Department of Air Force (DAF) Chief Modeling and Simulation Office (CMSO) and Naval Air Warfare Center - Aircraft Division (NAWCAD) goals. - Continue EBS/JSE integration and interoperability development supporting Synthetic Operational Test and Training for Command, Control, Communications and Battle Management (C3BM). Specific activities within this FY include integration incorporating E-7 simulation capabilities to support DAF CMSO goals. - Initiate demonstrations of secure fighter integration blended training events in research as well as operational locations, including The Five Eyes (FVEY) intelligence alliance sites, transitioning Fighter Integration Training Research (FITR) activities from AFRL labs to United States Air Force Training Bases and coalition Air Forces. - Initiate the development of a domain-agnostic, generalizable, next-generation training architecture/framework for targeted training to support personalized readiness, achieving Initial Operating Capability of the Readiness Environment for All Domain Integration (READI) network to support AFRL, ACC, and DAF CMSO Research and Development goals. <i>FY 2025 to FY 2026 Increase/Decrease Statement:</i> FY 2026 increased compared to FY 2025 by \$2.237 million due to increased interest in advanced training, simulation, and mission rehearsal to enhance warfighter readiness, including Joint simulation, and 5th and next generation training and rehearsal technology.			
Accomplishments/Planned Programs Subtotals		3.917	3.922
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy Not applicable			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 3					R-1 Program Element (Number/Name) PE 0603456F / Human Effectiveness Advanced Technology Development				Project (Number/Name) 635327 / Warfighter Interfaces			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
635327: Warfighter Interfaces	0.000	16.702	1.391	4.453	0.000	4.453	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
This project develops, demonstrates, and readies the transition of technologies to revolutionize the way airmen optimize multi-Unmanned Aerial Vehicle (multi-UAV), Battle Management Command and Control (BMC2), Command, Control, Communications and Battle Management (C3BM), and intel analysis capabilities of Air Force systems, including autonomous machines, and adaptive teams of Airmen, Guardians and machines. Improvements in the presentation of operational information to warfighters, from the system operator to the commander, must be developed in step with advancements in the acquisition, storage, and retrieval of information. This project provides the advances in understanding of human cognitive abilities, as well as the utilization of human interfaces, multisensory fusion, high-resolution image displays, and three-dimensional audio to customize communications, enhance shared understanding, and provide maximum situational awareness across a diverse user community simultaneously executing air, space, and cyber missions from geographically separate command, control, and battle management locations.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2024	FY 2025	FY 2026	
Title: Airman Machine Interfaces									1.338	1.391	4.453	
Description: Develops, demonstrates, and transitions advanced, situationally-adaptive and scalable interface technology and decision aiding tools for more rapid and accurate battlefield awareness and decision making, and maximized collaborative, distributed human-machine team performance. This is accomplished through integrated solutions that manage Airman and Guardian cognitive workload in complex, distributed, and degraded environments.												
FY 2025 Plans:												
- Continue advanced command and control technologies for operators in multiple domains, as well as enabling Air Battle Management System capabilities for distributed command and control.												
- Continue expanding the library of user interfaces for Autonomous Collaborative Enabling Technologies, and initiate multiple autonomous behaviors developed by Defense Advanced Research Projects Agency and the Air Force Strategic Development Planning and Experimentation in order to meet demands of strategic, operational, and tactical environments for manned-unmanned teaming.												
- Continue development of collaborative interfaces, leveraging intelligent agents and autonomy for cognitive workload reduction, and optimization of distributed human-human and human-machine teaming.												
- Complete the transition of open and interoperable software to Air Battle Management System-supported platforms.												
- Complete the transition of interface technologies and battle management command and control systems for base defense and protection of the tactical airspace from small unmanned aerial systems.												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603456F / <i>Human Effectiveness Advanced Technology Development</i>	Project (Number/Name) 635327 / <i>Warfighter Interfaces</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Complete automation of mission planning and debrief for assets with unique capabilities and include intelligent agent aided decision making. - Continue the development of mission planning for Intelligence, Surveillance, Reconnaissance optimization and battle damage assessment. - Complete the enhancement of map drawing capabilities for mission planning and debrief. FY 2026 Plans: - Complete the library of user interfaces for Autonomous Collaborative Enabling Technologies, and initiate multiple autonomous behaviors developed by the Defense Advanced Research Projects Agency, and Air Force Strategic Development Planning and Experimentation, to meet demands of strategic, operational, and tactical environments for manned-unmanned teaming. Specific activities within this FY include the transition of user interface technology software to the Air Force Life Cycle Management Center Fighters and Advanced Aircraft Directorate. - Continue development of advanced command and control (C2) software that connects geographically separated multi-domain operators and facilitates resynchronization following disrupted communications, as well as enabling Air Battle Management System capabilities for distributed C2. Specific activities within this FY include shifting the focus to long range kill web-enabling technologies, and emphasizing distributed planning and C2. - Continue development of collaborative interfaces, leveraging intelligent agents and autonomy for cognitive workload reduction, and optimization of distributed human-human and human-machine teaming. Specific activities within this FY include the addition of mission planning for autonomous assets for human-machine teaming during the full mission cycle; and introduction of Artificial Intelligence synthetic agents to existing planning and orchestration capabilities. - Initiate development of full-mission planning technology for Airmen and Guardians working with advanced AI to slash planning timelines leveraging intelligent agent-aided decision-making advances. Specific activities within this FY include integrating mission planning and debrief into the full mission cycle of crewed uncrewed teaming, as well as incorporating Human Machine Interfaces (HMI) for contingency management. - Initiate demonstrations of advanced joint all-domain battle management system technology. Specific activities within this FY include demonstrating software capabilities to the Command, Control, Communications and Battle Management Program Executive Office, and the Joint Fires Network Program Management Office. - Continue the development of mission planning for Intelligence, Surveillance, Reconnaissance optimization and battle damage assessment. Specific activities within this FY include transition of cloud software and standards to the Air Combat Command Intelligence Directorate, the Air Operations Center System Program Office, and agency partners. - Initiate Human Machine Interface development and integration with mission planning and debrief for Collaborative Combat Aircraft. Specific activities within this FY include transition of mission feasibility software to technology demonstration efforts including Fight Tonight and Resolute Sentry. Conduct human effectiveness evaluation of human-machine teaming elements of Fight Tonight, and other mission planning and debrief capabilities.			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 3		R-1 Program Element (Number/Name) PE 0603456F / <i>Human Effectiveness Advanced Technology Development</i>		Project (Number/Name) 635327 / <i>Warfighter Interfaces</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
- Initiate development of human-machine interfaces which support air campaign planning control between services and partner nations across a wide range of offensive air and ground mission types, developing or leveraging new and existing Project Agreements with partner nations, specifically Australia and Sweden, for shared interests in human-machine interface in-cockpit technology to interact with autonomous collaborative platforms, such as Collaborative Combat Aircraft. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$3.062 million due to the initiation of demonstrations of full-mission planning using artificial intelligence to slash planning timelines, initiation of demonstrations for joint-all-domain management systems technology, initiation of human-machine interface development for mission planning and debriefing for Collaborative Combat Aircraft, and initiation of demonstrations for human machine interfaces accomplishing air campaign planning between Services and partner nations.					
Title: Analytic Tools Description: Develop, demonstrate, and transition software and hardware tools that help conventional Department of Defense, Special Operations, and Intelligence customers to rapidly identify, analyze, shape, and operationalize all types of information without succumbing to "analysis paralysis." In addition to delivering stand-alone tools, this effort supports other Air Force Research Laboratory Technical Directorates. Build human-centric training solutions to: triage data-at-scale, automate mundane processes, optimize workflow, identify obscured patterns, mitigate cognitive overload, expedite logical decision-making, quantify performance metrics, accelerate human interpretation of information, and autonomously cue humans in live-virtual-constructive environments. These tools mitigate the scale and complexity in Joint All Domain Operations environments. FY 2025 Plans: There are no planned FY 2025 activities for the Analytic Tools Project. The project completed all planned activities by end of FY 2024 and closed out. FY 2026 Plans: There are no planned FY 2026 activities for the Analytic Tools Project. The project completed all planned activities by end of FY 2024 and closed out.			1.765	0.000	0.000
Accomplishments/Planned Programs Subtotals			3.103	1.391	4.453
			FY 2024	FY 2025	
Congressional Add: Automated geospatial intelligence algorithms			8.762	-	
FY 2024 Accomplishments: Conduct Congressionally directed research					
Congressional Add: Tactical Personal Area Network			4.837	-	

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603456F / Human Effectiveness Advanced Technology Development	Project (Number/Name) 635327 / Warfighter Interfaces
	FY 2024	FY 2025
FY 2024 Accomplishments: Conduct Congressionally directed research		
Congressional Adds Subtotals	13.599	-

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

N/A

Remarks

Tactical Personal Area Network Congressional Add now being executed out of Project 635324 Biosciences Performance Demonstration

D. Acquisition Strategy

Not applicable

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force	Date: June 2025

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603601F <i>I Conventional Weapons Technology</i>

COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
Total Program Element	0.000	122.854	125.460	99.263	0.000	99.263	-	-	-	-	-	-
63670A: <i>Weapon Technology Development</i>	0.000	63.165	73.669	56.268	0.000	56.268	-	-	-	-	-	-
63670B: <i>Weapon Concept Development</i>	0.000	59.689	51.791	42.995	0.000	42.995	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This program develops, integrates, and demonstrates advanced ordnance and guidance technologies for conventional weapons. The effort focuses on conventional ordnance component technologies such as warheads, fuzes, and explosives, as well as munition guidance component technologies such as navigation and control systems and seekers. Technologies to be developed, demonstrated, and integrated into system concepts will address blast, fragmentation, penetration, low collateral damage, variable depth/location fuzing, precise guidance, and high-performance and insensitive explosives. Efforts in this project have been coordinated through the Department of Defense Science and Technology Executive Committee process to harmonize efforts and eliminate duplication.

Funds in this PE may be used to investigate specified technology advancements in air, space and/or cyber domains.

The Air Force Research Laboratory (AFRL) is focused on high-impact, multi-domain science & technology (S&T) solutions that drive innovation now while laying the groundwork for the Air and Space Force to win the future fight. AFRL effectively synchronizes the Department of the Air Force (DAF) S&T enterprise and workforce to align towards the most consequential DAF priorities and accelerate the delivery of game-changing S&T.

This program includes funding for the requisite DAF Science & Engineering (S&E) and mission enabling civilian workforce with the necessary technical competencies to develop, manage, and deliver science & technology capabilities. The use of program funds in this program element is in conjunction with the civilian pay expenses budgeted in the following program elements: 1206601SF, 0601102F, 0602020F, 0602102F, 0602202F, 0602203F, 0602204F, 0602298F, 0602336F, 0602605F, 0602788F, and 0603680F. The Air Force Research Laboratory (AFRL) utilizes 10 USC 4091, "Authorities for certain positions at science and technology reinvention laboratories" to manage the workforce strength, structure, positions, and compensation.

This program element may include necessary expenses to support the operation and maintenance of facilities to manage, execute, and deliver science and technology capabilities.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force				Date: June 2025	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
3600: Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)		PE 0603601F I Conventional Weapons Technology			
B. Program Change Summary (\$ in Millions)	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Previous President's Budget	132.311	125.460	99.728	0.000	99.728
Current President's Budget	122.854	125.460	99.263	0.000	99.263
Total Adjustments	-9.457	0.000	-0.465	0.000	-0.465
• 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	-4.165	0.000			
• Other Adjustments	-5.292	0.000	-0.465	0.000	-0.465
Congressional Add Details (\$ in Millions, and Includes General Reductions)					
Project: 63670B: Weapon Concept Development					
Congressional Add: Next generation affordable direct attack munition					
Congressional Add Subtotals for Project: 63670B					
Congressional Add Totals for all Projects					
Change Summary Explanation					
Decrease in FY 2024 funding of \$5.292 million in Other Adjustment was for realignment of funds to PE 0602212F, Defense Laboratories R&D Projects, to implement the Department of Defense (DoD) Funding Laboratory Enhancements Across Four Categories (FLEX-4) authority under 10 U.S.C. Section 4123.					
Increase in FY 2026 funding of \$1.800 to Fund Hypersonic Science and Technology (S&T).					
Decrease in FY 2026 funding of \$0.303 reflects a strategic realignment to optimize core research areas and improve resource efficiency.					
The FY 2026 request was reduced by \$1.962 million for Advisory and Assistance Services to promote efficiencies and advance the policies of the Administration in alignment with Executive Order 14222, "Implementing the President's Department of Government Efficiency Cost Efficiency Initiative."					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 3					R-1 Program Element (Number/Name) PE 0603601F / Conventional Weapons Technology				Project (Number/Name) 63670A / Weapon Technology Development			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
63670A: Weapon Technology Development	0.000	63.165	73.669	56.268	0.000	56.268	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops, matures, assesses, and demonstrates advanced/innovative ordnance and guidance component and subsystem technologies for conventional weapons. The project focuses on maturation of advanced explosives, fuzes, warheads, sub-munitions, and weapon airframes, carriage and dispensing; as well as innovative munition seekers, weapon aerodynamics, navigation and control, and guidance subsystem integration/simulation.

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

	FY 2024	FY 2025	FY 2026
Title: Ordnance Technologies	30.946	35.332	26.986
Description: Develop and demonstrate integrated ordnance technologies to improve conventional munitions. Specific technical areas of focus include energetic materials, fuze technology, warhead sciences, and modeling and simulation tools.			
FY 2025 Plans: - Continue demonstrating and assessing advanced distributed, embedded fuzing concepts for long-term safety, survivability, and functionality. - Continue advanced development of ordnance technologies to allow tailored lethality by controlling weapon fragmentation. - Continue maturation of advanced ordnance technologies for rapid transition into high-speed strike weapon concepts, collecting complex arena test data for implementation into lethality modeling and simulation tools. - Continue developing test capabilities and high-fidelity analysis tools to quickly generate more accurate weaponeering data. - Continue developing advanced ordnance technologies for high-speed impact. - Continue developing advanced ordnance technologies/methodologies for functional defeat. - Complete research into armament systems for Special Operations applications. - Continue conducting lethality analyses for weapons and lethality/survivability tools at the meso/micro-scale. - Continue the development of high-fidelity test capabilities and analysis tools to evaluate ordnance technologies in relevant environments. - Continue incorporation of previously developed material models and improve/advance additional joint kinetic/directed energy common target models. - Continue synthesis and incorporation of warhead models for progressive collapse, multiple point initiation, secondary debris, and other models to include those supportive of coordinated and distributed impact.			
FY 2026 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603601F / Conventional Weapons Technology	Project (Number/Name) 63670A / Weapon Technology Development		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Continue demonstrating and assessing advanced distributed, embedded fuzing concepts for weapons long-term safety, survivability, and functionality. To mature high-speed weapon technologies to increase effectiveness across a diverse target set. - Continue advanced development of ordnance technologies to allow tailored lethality by controlling weapon fragmentation. To mature and demonstrate missile component technologies to increase lethality. - Continue collecting complex arena test data for implementation into lethality modeling and simulation tools. To mature advanced ordnance technologies for rapid transition into high-speed weapon concepts. - Continue developing test capabilities and high-fidelity analysis tools to quickly generate more accurate weaponeering data. To mature advanced ordnance technologies for rapid transition into high-speed weapon concepts. - Continue developing advanced ordnance technologies for high-speed impact. To mature high-speed weapon technologies to increase effectiveness focusing on counter maritime targets. - Continue developing advanced ordnance technologies/methodologies for functional defeat. To mature high-speed weapon technologies to increase effectiveness across a diverse target set. - Continue conducting lethality analyses for weapons and lethality/survivability tools at the meso/micro-scale. To mature high-speed weapon technologies to increase effectiveness across a diverse target set. - Continue the development of high-fidelity test capabilities and analysis tools to evaluate ordnance technologies in relevant environments. To mature state-of-the art for maritime engagements with digital demonstrations. - Continue Incorporation of previously developed material models and improve/advance additional joint kinetic/directed energy common target models. To improve joint used kinetic and directed energy analysis tools. - Continue synthesis and incorporation of warhead models for progressive collapse, multiple point initiation, secondary debris, and other models to include those supportive of coordinated and distributed impact. To mature high-speed weapon technologies to increase effectiveness across a diverse target set. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$8.346 million for advanced technology development in high-speed ordnance technology and ordnance technologies versus maritime targets. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency.				
Title: Guidance Technologies Description: Develop guidance technologies to improve the precision, controlled lethality, and flexibility of conventional munitions. Specific technical areas include precision navigation and terminal seekers. FY 2025 Plans: - Continue integration of hardware-in-the-loop, software-in-the-loop, and other modeling and simulation technologies for the demonstration of open architecture, high-speed, networked, collaborative and autonomous, and modular munition concepts.		32.219	38.337	29.282

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603601F / <i>Conventional Weapons Technology</i>	Project (Number/Name) 63670A / <i>Weapon Technology Development</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Complete investigation of alternative applications for seeker sub-system prototypes originally developed for platform self-protection. - Continue development of advanced, high-resolution infrared scene projectors, distributed simulation concepts, software-defined radio frequency test chamber, scene generation, mission, engagement, campaign level simulations, and panoramic infrared dome technologies. - Continue to develop technologies for precision navigation of weapons in Global Positioning System-denied scenarios. - Continue to mature and integrate advanced carriage and release concepts and sub-systems. - Continue improving multi-security level, cross-domain distributed modeling and simulation for munition research using distributed connectivity between Eglin Air Force Base facilities and other geographic locations. - Continue integrating higher-fidelity lethality models into guidance and control simulations to enhance weapon integrated performance. - Continue integrating higher fidelity constructive analysis tools with engagement and mission level modeling and simulation. - Continue design and development of a weapons digital ecosystem that enables digital engineering and the use of high-fidelity digital twinning across the weapons lifecycle. FY 2026 Plans: - Continue integration of hardware-in-the-loop, software-in-the-loop, and other modeling and simulation technologies for the demonstration of open architecture, high-speed, networked, collaborative and autonomous, and modular munition concepts. To break vendor lock with maturing weapon system open architecture standards. - Continue development of advanced, high-resolution infrared scene projectors, distributed simulation concepts, software-defined radio frequency test chamber, scene generation, mission, engagement, campaign level simulations, and panoramic infrared dome technologies. To increase fidelity of hardware-in-the-loop testing capabilities for evaluation of high-speed weapon concepts. - Continue to develop technologies for precision navigation of weapons in Global Positioning System-denied scenarios. To increase fidelity of precision navigation for evaluation of high-speed weapon concepts. Activities include the development of multiple navigation tracking capabilities. - End maturing and integrating advanced carriage and release concepts and sub-systems. To mature and demonstrate missile component technologies to increase loadout. - Continue improving multi-security level, cross-domain distributed modeling and simulation for munition research. To enhance communications and connectivity for munitions research across multiple geographic locations. - End integrating higher-fidelity lethality models into guidance and control simulations to enhance weapon integrated performance. To increase fidelity of lethality models for evaluation of high-speed weapon concepts. - Continue integrating higher fidelity constructive analysis tools with engagement and mission level modeling and simulation. To increase fidelity of constructive analysis tools for evaluation of high-speed weapon concepts. Activities include continued development of modules and plug-ins for 6DOF and AFSIM modeling and simulation.			
			FY 2026

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603601F / Conventional Weapons Technology	Project (Number/Name) 63670A / Weapon Technology Development		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Continue design and development of a weapons digital ecosystem that enables digital engineering and the use of high-fidelity digital twinning across the weapons lifecycle. To increase fidelity of the digital ecosystem utilizing an agile software development process, model-based systems engineering, weapon open systems architecture. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$9.055 million for advanced technology development in high-speed guidance technology and guidance technologies versus maritime targets. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency.				
Accomplishments/Planned Programs Subtotals		63.165	73.669	56.268
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
Not applicable.				

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 3					R-1 Program Element (Number/Name) PE 0603601F / Conventional Weapons Technology				Project (Number/Name) 63670B / Weapon Concept Development			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
63670B: Weapon Concept Development	0.000	59.689	51.791	42.995	0.000	42.995	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops, refines, integrates, demonstrates, and assesses ordnance and guidance technologies to reduce risk for potential conventional weapons acquisitions. The project concentrates in two effort areas, Air-to-Air Concept Development and Air-to-Ground Concept Development. The project focuses on risk reduction of advanced explosives, fuzes, warheads, sub-munitions, and weapon airframes, carriage and dispensing; as well as innovative munition seekers, weapon aerodynamics, navigation and control, and guidance subsystem integration/simulation.

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

	FY 2024	FY 2025	FY 2026
Title: Air-to-Air Concept Development	28.891	24.641	20.456
Description: Mature, integrate, and demonstrate air-to-air weapon components and systems to include ordnance, guidance, and carriage and release technologies to demonstrate war-fighter capability.			
FY 2025 Plans: - Continue developing the technology trade space to enable air-to-air weapons with robust capability in the future threat environment, including technologies for efficient propulsion, long-range, high lethality, efficient flight, high agility, miniaturization, as well as cost and risk reduction for both offensive and defensive purposes. - Continue developing and testing propulsion systems with flexibility to enable more adaptable next generation air-to-air weapons. • Continue conducting lethality analysis to enable design of small form factor warheads for lethality against the 2030-plus target set. - Continue transitioning advanced target models to other AF and DoD offices. - Continue developing preliminary design of air-to-air weapon concepts for sixth- generation platforms. - Continue exploring and documenting missile flight dynamics trade space. - Continue conducting wind-tunnel experiments to characterize airframes and validate aerodynamic codes leading to development of highly maneuverable and efficient missiles to counter advanced targets and improve persistence and survivability of future platforms. - Continue conducting ground and arena tests of advanced weapons experimental carriages for sixth-generation weapon concept and prepare for flight worthiness testing. - Continue performing experiments with small warheads to obtain data for lethality analysis to validate and improve designs. - Continue planning and executing integrated sub-system experiments.			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603601F / <i>Conventional Weapons Technology</i>	Project (Number/Name) 63670B / <i>Weapon Concept Development</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Continue modeling, simulation, analysis, and digital engineering in support of air-to-air advanced weapon technologies. FY 2026 Plans: - Continue developing the technology trade space to enable air-to-air weapons with robust capability in the future threat environment, including technologies for efficient propulsion, long-range, high lethality, efficient flight, high agility, miniaturization, as well as cost and risk reduction for both offensive and defensive purposes. To mature and demonstrate missile component technologies to increase range, loadout, lethality, and agility. - Continue developing and testing propulsion systems with flexibility to enable more adaptable next generation air-to-air weapons. To mature and demonstrate missile component technologies to increase range and agility. - Continue conducting lethality analysis to enable design of small form factor warheads for lethality against the 2030-plus target set. To mature and demonstrate missile component technology to increase lethality. - Continue transitioning advanced target models to other AF and DoD offices. To improve joint used target models. - Continue developing preliminary design of air-to-air weapon concepts for sixth- generation platforms. To mature and demonstrate missile component technologies to increase range and agility. - Continue exploring and documenting missile flight dynamics trade space. To mature and demonstrate missile component technologies to increase range, loadout, lethality, and agility. - Continue conducting wind-tunnel experiments to characterize airframes and validate aerodynamic codes leading to development of highly maneuverable and efficient missiles to counter advanced targets and improve persistence and survivability of future platforms. To enable air-to-air engagements against highly maneuverable and evasive targets to employ fewer weapons per sortie. - End conducting ground and arena tests of advanced weapons experimental carriages for sixth-generation weapon concept and prepare for flight worthiness testing. To mature and demonstrate missile component technologies to increase loadout. - Continue performing experiments with small warheads to obtain data for lethality analysis to validate and improve designs. To mature and demonstrate missile component technology to increase lethality. - Continue planning and executing integrated sub-system experiments. To mature and demonstrate missile component technologies to increase range, loadout, lethality, and agility. - Continue modeling, simulation, analysis, and digital engineering in support of air-to-air advanced weapon technologies. To mature and demonstrate missile component technologies to increase range, loadout, lethality, and agility. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$4.185 million due to reduced scope of efforts associated with high-speed system-level integration and concept demonstration of technical components/subsystems. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency.			
Title: Air-to-Ground Concept Development		30.798	27.150
			22.539

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 3		R-1 Program Element (Number/Name) PE 0603601F / <i>Conventional Weapons Technology</i>		Project (Number/Name) 63670B / <i>Weapon Concept Development</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
Description: Mature, integrate, and demonstrate air-to-ground weapon components and systems (ordnance, guidance, and carriage and release technologies) to demonstrate war-fighter capability. FY 2025 Plans: - Continue technology risk reduction including demonstration and flight testing for weapons concepts responsive to the future threat environment (including hypersonic and high-speed concepts). - Continue technology risk reduction for hypersonic and high-speed weapon concepts development within a scalable, cloud-enabled modeling and simulation ecosystem. - Continue developing kinetic payloads, seeker, and fuze technology for hypersonic and high-speed applications. - Continue modeling, simulation, analysis, and digital engineering in support of air-to-ground advanced weapon technologies. FY 2026 Plans: - Continue technology risk reduction including demonstration and flight testing for weapons concepts responsive to the future threat environment (including hypersonic and high-speed concepts). To mature and demonstrate advanced propulsion, advanced seekers, alternative navigation, and multi-mission ordnance technologies. - Continue technology risk reduction for hypersonic and high-speed weapon concepts development within a scalable, cloud-enabled modeling and simulation ecosystem. To upgrade Department of Defense lethality tools with damage from hypersonic weapons. - Continue developing kinetic payloads, seeker, and fuze technology for hypersonic and high-speed applications. To mature high-speed weapon technologies to increase effectiveness across a diverse target set. - Continue modeling, simulation, analysis, and digital engineering in support of air-to-ground advanced weapon technologies. To mature high-speed weapon technologies to increase effectiveness across a diverse target set. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$4.611 million due to reduced scope of efforts associated with High-speed system-level integration and concept demonstration of technical components/subsystems. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency.					
Accomplishments/Planned Programs Subtotals			59.689	51.791	42.995
			FY 2024	FY 2025	
Congressional Add: Next generation affordable direct attack munition			0.000	-	
FY 2024 Accomplishments: Only received FY 2023 funds for this congressional add					
Congressional Adds Subtotals			0.000	-	

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603601F / Conventional Weapons Technology	Project (Number/Name) 63670B / Weapon Concept Development
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy Not applicable.		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force	Date: June 2025

Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>	PE 0603605F / <i>Advanced Weapons Technology</i>											
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
Total Program Element	0.000	96.178	25.050	4.434	0.000	4.434	-	-	-	-	-	-
633151: <i>High Power Solid State Laser Technology</i>	0.000	19.281	0.000	0.000	0.000	0.000	-	-	-	-	-	-
633152: <i>High Power Microwave Development and Integration</i>	0.000	76.897	25.050	4.434	0.000	4.434	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

The Air Force Research Laboratory (AFRL) is focused on high-impact, multi-domain science & technology (S&T) solutions that drive innovation now while laying the groundwork for the Air and Space Force to win the future fight. AFRL effectively synchronizes the Department of the Air Force (DAF) S&T enterprise and workforce to align towards the most consequential DAF priorities and accelerate the delivery of game-changing S&T.

This program develops and demonstrates integrated, state of the art, high energy laser (HEL) and high power electromagnetic (HPEM) directed energy (DE) weapon demonstrator systems to satisfy Department of the Air Force requirements in areas including: counter adversary unmanned aerial systems (c-UAS), counter adversary intelligence/surveillance/reconnaissance (c-ISR), counter adversary missiles (c-Missile), counter adversary electronics (c-Electronic), and other mission objectives. Efforts in this program have been coordinated through the Department of Defense Science and Technology Executive Committee process to harmonize efforts and eliminate duplication. Technologies developed under PE 0602605F (Directed Energy Technology), 624867 (Advanced Weapons & Survivability Technology) and 625173 (Laser Technology), feed directly into this program.

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

This program element may include necessary expenses to support the operation and maintenance of facilities to manage, execute, and deliver science and technology capabilities.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force				Date: June 2025	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
3600: Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)		PE 0603605F I Advanced Weapons Technology			
B. Program Change Summary (\$ in Millions)	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Previous President's Budget	102.997	25.050	4.935	0.000	4.935
Current President's Budget	96.178	25.050	4.434	0.000	4.434
Total Adjustments	-6.819	0.000	-0.501	0.000	-0.501
• Congressional General Reductions	-0.004	0.000			
• Congressional Directed Reductions	-4.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	5.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-0.002	0.000			
• SBIR/STTR Transfer	-3.693	0.000			
• Other Adjustments	-4.120	0.000	-0.501	0.000	-0.501
Congressional Add Details (\$ in Millions, and Includes General Reductions)					
Project: 633151: High Power Solid State Laser Technology					
Congressional Add: Program decrease - LIDAR CUAS automated target recognition					
Congressional Add Subtotals for Project: 633151					
Congressional Add Totals for all Projects					
Change Summary Explanation					
FY 2026 decreased compared to FY 2025 by \$0.501 million due to programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 3					R-1 Program Element (Number/Name) PE 0603605F / Advanced Weapons Technology				Project (Number/Name) 633151 / High Power Solid State Laser Technology			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
633151: High Power Solid State Laser Technology	0.000	19.281	0.000	0.000	0.000	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
This project develops and demonstrates integrated, state of the art, high energy laser (HEL) weapon demonstrator systems to satisfy Department of the Air Force requirements in areas including, counter adversary unmanned aerial systems (c-UAS), counter adversary intelligence/surveillance/reconnaissance (c-ISR), and counter adversary missiles (c-Missile) for High Value Airborne Asset (HVAA) protection and point defense. Technologies developed under PE 0602605F (Directed Energy Technology), 625173 (Laser Technology), feed directly into this project.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2024	FY 2025	FY 2026	
Title: High Energy Laser/Beam Control									14.281	0.000	0.000	
Description: Develop and demonstrate integrated high energy laser (HEL) weapon demonstrators to satisfy Department of the Air Force requirements including, counter adversary unmanned aerial systems (c-UAS), counter-adversary intelligence/surveillance/reconnaissance (c-ISR), and counter-adversary missiles (c-Missile) for high value airborne asset (HVAA) protection and point defense mission objectives. This project will integrate advancements made in laser sources, optical beam combination techniques, optical beam control technologies, and optical beam propagation methodologies realized under PE 0602605F (Directed Energy Technology), 625173 (Laser Technology), onto ground-mobile and airborne platforms and demonstrate capabilities against threats of interest.												
FY 2025 Plans:												
- Reduce testing and demonstration of the Packaged high-energy laser (HEL) and beam control subsystem, supported by in-house government personnel only.												
- Reduce planning for next phase of advanced integrated technologies for compact, low-size, weight and power (SWaP) airborne laser weapon system, supported by in-house government personnel only.												
FY 2026 Plans:												
- Stop work on testing and demonstrating a packaged high-energy laser (HEL) and beam control subsystem.												
- Stop work on planning for next phase of advanced integrated technologies for compact, low-size, weight and power (SWaP) airborne laser weapon system.												
FY 2025 to FY 2026 Increase/Decrease Statement:												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603605F / Advanced Weapons Technology	Project (Number/Name) 633151 / High Power Solid State Laser Technology		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
Not applicable.				
Accomplishments/Planned Programs Subtotals		14.281	0.000	0.000
		FY 2024	FY 2025	
Congressional Add: Program decrease - LIDAR CUAS automated target recognition		5.000	0.000	
FY 2024 Accomplishments: Conducted Congressionally directed efforts.				
FY 2025 Plans: Not applicable.				
Congressional Adds Subtotals		5.000	0.000	
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
Not Applicable				
D. Acquisition Strategy				
Not Applicable				

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 3					R-1 Program Element (Number/Name) PE 0603605F / Advanced Weapons Technology				Project (Number/Name) 633152 / High Power Microwave Development and Integration			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
633152: High Power Microwave Development and Integration	0.000	76.897	25.050	4.434	0.000	4.434	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops and demonstrates high power microwave and other unconventional electromagnetic field generation and transmission technologies that can be integrated into future weapon systems to support a wide range of the Department of the Air Force missions such as air base defense or the damage/destruction of an adversary's electronic infrastructure. It also provides inputs to the susceptibility, vulnerability, and lethality databases used across the Department of Defense to understand thresholds for scalable effects of directed energy weapons.

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

	FY 2024	FY 2025	FY 2026
Title: High Power Microwave Technologies	76.897	25.050	4.434
Description: This project develops and demonstrates integrated, state of the art, high power microwave (HPM) weapon demonstrator systems to satisfy Department of the Air Force requirements in areas including, counter-adversary unmanned aerial systems (c-UAS), counter-adversary intelligence/surveillance/reconnaissance (c-ISR), counter-adversary missiles (c-Missile), counter-adversary electronics (c-Electronic) and point defense. FY 2025 Plans: - Terminate the development of high power microwave components to enable the integration into aerial platforms, ground-based systems, and mobile systems; focus on technologies that can decrease the size and weight of systems while still providing the same capability. - Terminate the development of modeling tools and test capabilities to evaluate current and projected blue directed energy weapons against relevant red assets. - Initiate in-house government exploration of novel methods to increase power; focus on reducing the logistical requirements and maintenance requirements of the sources. - Terminate development of next generation high power microwave high frequency sources. - Terminate development of a high power microwave system for an integrated air and missile defense mission; focus on technologies that would allow the system to be compliant with agile combat employment. - Continue a high-priority base defense mission with joint high power microwave system with the Military Services for Directed Energy Frontline Electromagnetic Neutralization and Defeat (DEFEND). - Initiate in-house government design effort of antenna for base defense and airborne applications.			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603605F / <i>Advanced Weapons Technology</i>	Project (Number/Name) 633152 / <i>High Power Microwave Development and Integration</i>		
B. Accomplishments/Planned Programs (\$ in Millions) - Initiate in-house government design effort of new sources for airborne applications. FY 2026 Plans: - Continue in-house government exploration of novel methods to increase power; focus on reducing the logistical requirements and maintenance requirements of the sources. Specific activities within this fiscal year include making sources more reliable and robust. - Complete a base defense demonstration with Directed Energy Frontline Electromagnetic Neutralization and Defeat (DEFEND) system in collaboration with the Navy. - Continue in-house government design effort of antenna for base defense and airborne applications with a focus on designing conformal antennas. - Continue in-house government design effort of new sources for airborne applications with a focus on new frequencies and waveforms. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 decreased compared to FY 2025 by \$20.616 million due to pre-programmed reduction in scope of work as the program progressed from procurement/integration to demonstration.		FY 2024	FY 2025	FY 2026
Accomplishments/Planned Programs Subtotals		76.897	25.050	4.434
C. Other Program Funding Summary (\$ in Millions) N/A Remarks Not Applicable D. Acquisition Strategy Not Applicable				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)					R-1 Program Element (Number/Name) PE 0603680F I Manufacturing Technology Program							
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
Total Program Element	0.000	165.721	116.130	38.891	0.000	38.891	-	-	-	-	-	-
635280: Manufacturing Technologies	0.000	165.721	116.130	38.891	0.000	38.891	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Air Force Research Laboratory (AFRL) is focused on high-impact, multi-domain science & technology (S&T) solutions that drive innovation now while laying the groundwork for the Air and Space Force to win the future fight. AFRL effectively synchronizes the Department of the Air Force (DAF) S&T enterprise and workforce to align towards the most consequential DAF priorities and accelerate the delivery of game-changing S&T.

This program executes technical efforts to develop and maintain an affordable and reliable industrial base and manufacturing capability responsive to Department of the Air Force warfighter needs. The program develops and improves manufacturing technologies and processes to reduce transition risk, enable cost reduction, improve component and system quality, increase readiness and affordable mission availability, enhance industrial capability, and promote transformation through the industrial base. Value stream modifications and manufacturing throughput improvements are implemented to shorten weapon system cycle times during design, development, production, and sustainment. Cost savings are realized through early engagement with stakeholders to promote producible designs, ensuring the industrial base will be ready to manufacture at the needed quantities. Manufacturing technologies objectives are conducted through industrial partnerships that enable targeted investment of manufacturing technologies and reduce risk in the industrial supply chain for existing weapon system upgrades and new warfighter systems. Efforts in the program have been coordinated through the Department of Defense Science and Technology Executive Committee process to harmonize efforts and eliminate duplication.

Funds in this PE may be used to investigate specified technology advancements in air, space and/or cyber domains.

This program includes funding for the requisite DAF Science & Engineering (S&E) and mission enabling civilian workforce with the necessary technical competencies to develop, manage, and deliver science & technology capabilities. The use of program funds in this program element is in conjunction with the civilian pay expenses budgeted in the following program elements: 1206601SF, 0601102F, 0602020F, 0602102F, 0602202F, 0602203F, 0602204F, 0602298F, 0602336F, 0602602F, 0602605F, and 0602788F. In FY 2026, \$8.996 million is budgeted in this program for 45 direct Full-Time Equivalent (FTE) civilians. The Air Force Research Laboratory (AFRL) utilizes 10 USC 4091, "Authorities for certain positions at science and technology reinvention laboratories" to manage the workforce strength, structure, positions, and compensation.

This program element may include necessary expenses to support the operation and maintenance of facilities to manage, execute, and deliver science and technology capabilities.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force	Date: June 2025

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603680F / <i>Manufacturing Technology Program</i>

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

B. Program Change Summary (\$ in Millions)	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Previous President's Budget	44.422	34.730	38.494	0.000	38.494
Current President's Budget	165.721	116.130	38.891	0.000	38.891
Total Adjustments	121.299	81.400	0.397	0.000	0.397
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	129.500	81.400			
• Congressional Directed Transfers	-1.955	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-4.547	0.000			
• Other Adjustments	-1.699	0.000	0.397	0.000	0.397

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

Project: 635280: *Manufacturing Technologies*

Congressional Add: *Program increase - metal additive manufacturing*

Congressional Add: *Program Increase - beryllium manufacturing*

Congressional Add: *Program increase - thermoplastic flight control components for advanced manned and unmanned platforms*

Congressional Add: *Program increase - rare gas cryogenic distillation and purification*

Congressional Add: *Program increase - vertical integration of scramjet supply chain*

Congressional Add: *Program increase - gallium oxide for high power electronics*

Congressional Add: *Program increase - aerospace film technology manufacturing*

Congressional Add: *Program increase - aerospace films for increased operational range*

Congressional Add: *Program increase - operationalizing additive manufacturing for sustainment and modernization research*

Congressional Add: *Program increase - agile additive manufacturing for advanced hypersonic systems technology*

Congressional Add: *Program increase - virtual, augmented, and mixed reality readiness*

Congressional Add: *Program increase - alloy additive manufacturing*

Congressional Add: *Program increase - additive manufactured lightweight UAV skins*

	FY 2024	FY 2025
	8.269	0.000
	3.879	0.000
	5.837	0.000
	4.864	0.000
	14.593	15.000
	9.729	5.000
	3.891	0.000
	4.864	0.000
	18.971	0.000
	4.864	0.000
	7.783	0.000
	2.918	0.000
	2.918	0.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I</i> BA 3: <i>Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603680F <i>I Manufacturing Technology Program</i>	
<u>Congressional Add Details (\$ in Millions, and Includes General Reductions)</u>		FY 2024	FY 2025
Congressional Add: <i>Program increase - AI robotic manufacturing</i>		4.864	0.000
Congressional Add: <i>Program increase - composites for advanced air mobility</i>		6.810	0.000
Congressional Add: <i>Program increase - expansion of thermoplastic composites and alternatives to critical minerals</i>		7.296	0.000
Congressional Add: <i>Program increase - glass packaging solutions for miniaturization</i>		1.945	0.000
Congressional Add: <i>Program increase - hypersonics development to accelerate production readiness</i>		1.945	0.000
Congressional Add: <i>Program increase - MRO advanced process technology development</i>		4.864	0.000
Congressional Add: <i>Program increase - needled thermoplastic composite textiles for low cost, complex aerostructures</i>		4.864	0.000
Congressional Add: <i>Program increase - classified additive manufacturing</i>		0.000	20.000
Congressional Add: <i>Program increase - F-35 agnostic battery development</i>		0.000	4.000
Congressional Add: <i>Program increase - large-format metal additive manufacturing for hypersonics</i>		0.000	5.000
Congressional Add: <i>Program increase - Rapidly additively manufactured skins for CCA</i>		0.000	5.000
Congressional Add: <i>Program increase - Affordable manufacturing of carbon nanotube data cables</i>		0.000	1.000
Congressional Add: <i>Program increase - AFSC depot maintenance data science</i>		0.000	6.400
Congressional Add: <i>Program increase - classified agile aircraft manufacturing</i>		0.000	15.000
Congressional Add: <i>Program increase - High temperature composite material manufacturing</i>		0.000	3.000
Congressional Add: <i>Program increase - Manufacturability of attritable sUAS</i>		0.000	2.000
Congressional Add Subtotals for Project: 635280		125.968	81.400
Congressional Add Totals for all Projects		125.968	81.400
<u>Change Summary Explanation</u>			
The FY 2026 request was reduced by \$0.277 million for Advisory and Assistance Services to promote efficiencies and advance the policies of the Administration in alignment with Executive Order 14222, "Implementing the President's Department of Government Efficiency Cost Efficiency Initiative."			
The FY 2026 request was reduced by \$0.937 million for civilian personnel to optimize the workforce in compliance with Executive Order 14210, "Implementing the President's Department of Government Efficiency Workforce Optimization Initiative."			
The remainder of the overall FY 2026 increase of \$0.397 million is due to updated average work year cost for civilian pay and negative programmatic adjustments within the Science and Technology portfolio. This reduction reflects a strategic realignment to optimize core research areas and improve resource efficiency			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)		R-1 Program Element (Number/Name) PE 0603680F I Manufacturing Technology Program		
In FY 2024, the Congressionally Directed Transfer of \$1.094 million was due to the realignment of space unique S&T to Unites States Space Force RDT&D, PE 1206616SF, Space Advanced Technology Development/Demo; Project 633834, Project Integrated Space Technology Demonstrations; Effort: Manufacturing for Space Systems.				
In FY 2024, the decrease of \$1.699 million in Other Adjustments was due to realignment of funds to PE 0602212F, Defense Laboratories R&D Projects, to implement the Department of Defense (DoD) Funding Laboratory Enhancements Across Four Categories (FLEX-4) authority under 10 U.S.C. Section 4123.				
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
Title: Affordable Mission Availability		10.645	11.088	12.103
Description: Develop and transition pervasive manufacturing technologies for affordable mission availability of Department of the Air Force components and systems.				
FY 2025 Plans:				
- Continue advancing high demand specialized manufacturing technologies to develop cost effective conventional production, overhaul, and specialty material repair technologies to enable affordable sustainment of aircraft systems.				
- Continue developing cost-effective manufacturing and repair processes to meet specific needs of Programs of Record and depots: continue manufacturing repair technologies for turbine engine components.				
- Continue developing manufacturing methods to meet the needs of next generation hypersonic platforms.				
- Continue developing and demonstrating the manufacturability of materials, processes and devices for command and control communication technologies, intelligence, surveillance and reconnaissance systems, and RF, digital and power management components.				
- Continue manufacturing technologies for high temperature sensors and windows.				
- In FY 2025 and beyond work in manufacturing for intelligence, surveillance and reconnaissance systems and high temperature components for space-based platforms will be accomplished in 3620F: Research, Development, Test & Evaluation, Space Force; Program 1206616SF: Space Advanced Technology Development/Demo; Project 633834: Project Integrated Space Technology Demonstrations; Effort: Manufacturing for Space Systems				
FY 2026 Plans:				
- Continue advancing high demand specialized manufacturing technologies including additive manufacturing, robotics and automation to develop cost effective conventional production, overhaul, and specialty material repair technologies to enable affordable sustainment of legacy aircraft systems.				
- Continue developing cost-effective manufacturing and repair processes such as modular battery manufacturing, turbine engine repair processes, and automation to reduce touch labor to meet specific needs of Programs of Record and depots to increase mission availability due to decreased maintenance down time.				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603680F <i>I Manufacturing Technology Program</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Continue developing and transitioning manufacturing technologies to meet the performance and production demands of hypersonic weapons and components. Content responsive to PEO needs of multiple fielded systems as well as future systems and includes developing manufacturing processes for high temperature windows, weapons structure, major subsystems and sensors. - Continue developing and demonstrating the manufacturability of materials, processes and devices for command and control communication technologies, intelligence, surveillance and reconnaissance systems, and RF, digital and high power electronic devices. - Continue developing and demonstrating the manufacturability of materials, processes, and devices for command and control communication technologies, intelligence, surveillance and reconnaissance systems, and RF, digital and power management components. - In collaboration with industry Primes and their suppliers, develop new manufacturing methods, technologies and processes to solve cost and manufacturing rate issues that are likely to cause future production failures of DAF programs of record. Examples include developing additional manufacturing sources for bottleneck components that drive low production yields and long delays, particularly in high volume advanced aircraft and rapid production munitions programs. The pervasive application of this research to multiple programs of record explains funding in the Manufacturing Technologies program rather than in individual programs of record . FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$1.015 million due to updated average work year cost for civilian pay and added emphasis on manufacturing technologies addressing multiple DAF PEOs' documented needs,				
Title: Advanced Manufacturing Technologies Description: Develop and transition affordable advanced manufacturing for Department of the Air Force fielded and future weapon systems. FY 2025 Plans: - Continue enabling and promoting advanced manufacturing processes, techniques, and equipment availability for reducing materiel acquisition, maintenance and repair costs. - Continue developing and demonstrating digital engineering concepts into manufacturing processes. - Continue developing, demonstrating and evaluating additively manufactured aerospace components and subcomponents. - Continue developing and demonstrating technologies enabling factory of the future, digital supply chain management, and industrial internet of things to provide improvements in production, delivery and support of warfighter capabilities. FY 2026 Plans:		20.792	14.787	17.254

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603680F <i>I Manufacturing Technology Program</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Continue enabling advanced manufacturing processes, techniques, and equipment availability through automation, robotics, mixed reality and digital transformations for reducing materiel weapons acquisition, maintenance and repair costs - Continue developing and demonstrating digital engineering concepts into manufacturing processes for reduced design-through-production cycle times, and reduced weapons systems costs. Examples include 1) developing tools to utilize block chain technology to seamlessly and securely share manufacturing throughout Prime manufacturer's supply chain and with the DAF Program Office and 2) development of digital design and modeling tools enabling rapid, high quality assembly of parts from multiple manufacturers. - Accelerate developing, demonstrating, and evaluating additively manufactured aerospace components and subcomponents to address diminishing manufacturing sources issues of original designed parts no longer available/produced and to produce previously unmanufacturable part geometries/shapes for increased performance. - Complete developing and demonstrating technologies enabling factory of the future, digital supply chain management, and industrial internet of things. - Initiate developing tools to rapidly develop digital models of parts under depot repair to enable rapid automation of repair processes currently completed through touch labor. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$2.467 million due to updated average work year cost for civilian pay and increased research needed to qualify new technologies for use in repairs and replacement parts.				
Title: Manufacturing for the Future Force Description: Develop and transition manufacturing technologies for advanced solutions that shape the future force across multiple domains. FY 2025 Plans: - Continue development of high demand manufacturing technologies including low cost and attritable systems, thermal protection materials for high temperature applications and other manufacturing technologies geared toward realizing the future force and to provide a cost-imposing strategy against adversarial forces. - Initiate developing manufacturing processes for substrates to enable quantum sensing. FY 2026 Plans: - Continue development of high demand manufacturing technologies including low cost for attritable systems, thermal protection materials for high temperature applications, and other manufacturing technologies geared toward realizing the future force through autonomous collaborative platforms, low-cost munitions, hypersonic weapons, and alternative position, navigation and timing solutions. - Continue developing manufacturing processes for substrates to enable quantum sensing.		8.316	8.855	9.534

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603680F <i>I Manufacturing Technology Program</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
- Initiate development of methodologies and tools to rapidly on-board non-aerospace industries into DAF supply chains for wartime production surge capacity. Research includes development of digital models and toolsets to rapidly qualify traditional civilian industries to enter defense aerospace supply chains.				
FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by 0.679 million due to updated average work year cost for civilian pay and to provide mechanism for rapidly expanding the defense industrial base.				
Accomplishments/Planned Programs Subtotals		39.753	34.730	38.891
		FY 2024	FY 2025	
Congressional Add: Program increase - metal additive manufacturing		8.269	0.000	
FY 2024 Accomplishments: Conducted Congressionally directed efforts.				
FY 2025 Plans: Not applicable				
Congressional Add: Program Increase - beryllium manufacturing		3.879	0.000	
FY 2024 Accomplishments: Conducted Congressionally directed efforts.				
FY 2025 Plans: Not applicable				
Congressional Add: Program increase - thermoplastic flight control components for advanced manned and unmanned platforms		5.837	0.000	
FY 2024 Accomplishments: Conducted Congressionally directed efforts.				
FY 2025 Plans: Not applicable				
Congressional Add: Program increase - rare gas cryogenic distillation and purification		4.864	0.000	
FY 2024 Accomplishments: Conducted Congressionally directed efforts.				
FY 2025 Plans: Not applicable				
Congressional Add: Program increase - vertical integration of scramjet supply chain		14.593	15.000	
FY 2024 Accomplishments: Conducted Congressionally directed efforts.				
FY 2025 Plans: Conduct Congressionally directed efforts.				
Congressional Add: Program increase - gallium oxide for high power electronics		9.729	5.000	

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I</i> BA 3: <i>Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603680F <i>I Manufacturing Technology Program</i>	
		FY 2024	FY 2025
FY 2024 Accomplishments: Conducted Congressionally directed efforts.			
FY 2025 Plans: Conduct Congressionally directed efforts.			
Congressional Add: Program increase - aerospace film technology manufacturing		3.891	0.000
FY 2024 Accomplishments: Conducted Congressionally directed efforts.			
FY 2025 Plans: Not applicable			
Congressional Add: Program increase - aerospace films for increased operational range		4.864	0.000
FY 2024 Accomplishments: Conducted Congressionally directed efforts.			
FY 2025 Plans: Not applicable			
Congressional Add: Program increase - operationalizing additive manufacturing for sustainment and modernization research		18.971	0.000
FY 2024 Accomplishments: Conducted Congressionally directed efforts.			
FY 2025 Plans: Not applicable			
Congressional Add: Program increase - agile additive manufacturing for advanced hypersonic systems technology		4.864	0.000
FY 2024 Accomplishments: Conducted Congressionally directed efforts.			
FY 2025 Plans: Not applicable			
Congressional Add: Program increase - virtual, augmented, and mixed reality readiness		7.783	0.000
FY 2024 Accomplishments: Conducted Congressionally directed efforts.			
FY 2025 Plans: Not applicable			
Congressional Add: Program increase - alloy additive manufacturing		2.918	0.000
FY 2024 Accomplishments: Conducted Congressionally directed efforts.			
FY 2025 Plans: Not applicable			
Congressional Add: Program increase - additive manufactured lightweight UAV skins		2.918	0.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I</i> BA 3: <i>Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603680F <i>I Manufacturing Technology Program</i>	
		FY 2024	FY 2025
FY 2024 Accomplishments: Conducted Congressionally directed efforts.			
FY 2025 Plans: Not applicable			
Congressional Add: Program increase - AI robotic manufacturing		4.864	0.000
FY 2024 Accomplishments: Conducted Congressionally directed efforts.			
FY 2025 Plans: Not applicable			
Congressional Add: Program increase - composites for advanced air mobility		6.810	0.000
FY 2024 Accomplishments: Conducted Congressionally directed efforts.			
FY 2025 Plans: Not applicable			
Congressional Add: Program increase - expansion of thermoplastic composites and alternatives to critical minerals		7.296	0.000
FY 2024 Accomplishments: Conducted Congressionally directed efforts.			
FY 2025 Plans: Not applicable			
Congressional Add: Program increase - glass packaging solutions for miniaturization		1.945	0.000
FY 2024 Accomplishments: Conducted Congressionally directed efforts.			
FY 2025 Plans: Not applicable			
Congressional Add: Program increase - hypersonics development to accelerate production readiness		1.945	0.000
FY 2024 Accomplishments: Conducted Congressionally directed efforts.			
FY 2025 Plans: Not applicable			
Congressional Add: Program increase - MRO advanced process technology development		4.864	0.000
FY 2024 Accomplishments: Conducted Congressionally directed efforts.			
FY 2025 Plans: Not applicable			
Congressional Add: Program increase - needled thermoplastic composite textiles for low cost, complex aerostructures		4.864	0.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603680F <i>I Manufacturing Technology Program</i>	
		FY 2024	FY 2025
FY 2024 Accomplishments: Conducted Congressionally directed efforts.			
FY 2025 Plans: Not applicable			
Congressional Add: Program increase - classified additive manufacturing		0.000	20.000
FY 2024 Accomplishments: Not applicable			
FY 2025 Plans: Conduct Congressionally directed efforts.			
Congressional Add: Program increase - F-35 agnostic battery development		0.000	4.000
FY 2024 Accomplishments: Not applicable			
FY 2025 Plans: Conduct Congressionally directed efforts.			
Congressional Add: Program increase - large-format metal additive manufacturing for hypersonics		0.000	5.000
FY 2024 Accomplishments: Not applicable			
FY 2025 Plans: Conduct Congressionally directed efforts.			
Congressional Add: Program increase - Rapidly additively manufactured skins for CCA		0.000	5.000
FY 2024 Accomplishments: Not applicable			
FY 2025 Plans: Conduct Congressionally directed efforts.			
Congressional Add: Program increase - Affordable manufacturing of carbon nanotube data cables		0.000	1.000
FY 2024 Accomplishments: Not applicable			
FY 2025 Plans: Conduct Congressionally directed efforts.			
Congressional Add: Program increase - AFSC depot maintenance data science		0.000	6.400
FY 2024 Accomplishments: Not applicable			
FY 2025 Plans: Conduct Congressionally directed efforts.			
Congressional Add: Program increase - classified agile aircraft manufacturing		0.000	15.000
FY 2024 Accomplishments: Not applicable			
FY 2025 Plans: Conduct Congressionally directed efforts.			
Congressional Add: Program increase - High temperature composite material manufacturing		0.000	3.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)		R-1 Program Element (Number/Name) PE 0603680F I Manufacturing Technology Program	
		FY 2024	FY 2025
FY 2024 Accomplishments: Not applicable			
FY 2025 Plans: Conduct Congressionally directed efforts.			
Congressional Add: Program increase - Manufacturability of attritable sUAS		0.000	2.000
FY 2024 Accomplishments: Not applicable			
FY 2025 Plans: Conduct Congressionally directed efforts.			
Congressional Adds Subtotals		125.968	81.400
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 2026 Air Force	Date: June 2025

Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>	PE 0603788F / <i>Battlespace Knowledge Development and Demonstration</i>											
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
Total Program Element	0.000	59.611	53.672	30.812	0.000	30.812	-	-	-	-	-	-
635321: <i>C4I Battlespace Dev and Demo</i>	0.000	47.273	44.425	18.155	0.000	18.155	-	-	-	-	-	-
635329: <i>Cyber Battlespace Dev & Demo</i>	0.000	12.338	9.247	12.657	0.000	12.657	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

The Air Force Research Laboratory (AFRL) is focused on high-impact, multi-domain science & technology (S&T) solutions that drive innovation now while laying the groundwork for the Air and Space Force to win the future fight. AFRL effectively synchronizes the Department of the Air Force (DAF) S&T enterprise and workforce to align towards the most consequential DAF priorities and accelerate the delivery of game-changing S&T.

This program executes advanced development and demonstration of information technologies for the Department of the Air Force to address warfighter requirement gaps and accelerate the delivery of capabilities for Command, Control, Communications, Computers, Cyber, Intelligence, Surveillance, Reconnaissance, and Targeting (C5ISR). These technologies are required to advance current capabilities in C5ISR for integrated systems and processes, used by the Department of the Air Force and its joint & coalition partners, to collect, process, analyze, and disseminate information to achieve decision-making superiority for warfighter operations.

The C4I Battlespace Dev and Demo Project provides technology enabling the Air Force (a) to perform combined joint all-domain command & control (CJADC2) across the full spectrum of operations; (b) to field assured communications and networks in support of persistent, global, and survivable kinetic and non-kinetic military operations; (c) to process, fuse, and exploit data & information from multiple sources for rapid decision making and situational awareness. C4I is defined as Command, Control, Communications, Computers, and Intelligence.

The Cyber Battlespace Dev & Demo Project develops the ability to deliver cyber-offense capabilities (access, stealth, persistence, intelligence, and non-kinetic weapons), cyber defense capabilities (attack detection, attack attribution, and response) and cyber resilience (adaptation, recovery, survivability).

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

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force				Date: June 2025		
Appropriation/Budget Activity		R-1 Program Element (Number/Name)				
3600: Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)		PE 0603788F I Battlespace Knowledge Development and Demonstration				
B. Program Change Summary (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Previous President's Budget		37.779	26.172	31.468	0.000	31.468
Current President's Budget		59.611	53.672	30.812	0.000	30.812
Total Adjustments		21.832	27.500	-0.656	0.000	-0.656
• Congressional General Reductions		0.000	0.000			
• Congressional Directed Reductions		0.000	0.000			
• Congressional Rescissions		0.000	0.000			
• Congressional Adds		25.500	27.500			
• Congressional Directed Transfers		0.000	0.000			
• Reprogrammings		0.000	0.000			
• SBIR/STTR Transfer		-2.157	0.000			
• Other Adjustments		-1.511	0.000	-0.656	0.000	-0.656
<u>Congressional Add Details (\$ in Millions, and Includes General Reductions)</u>						
Project: 635321: C4I Battlespace Dev and Demo				FY 2024	FY 2025	
Congressional Add: Program Increase - Antenna Form Factor Development for Assured Communications and Networks				19.319	0.000	
Congressional Add: Program Increase - B-52 Agile Pod Capability				1.931	10.000	
Congressional Add: Program Increase - Nationwide Integration of Time Resiliency for Operations				0.965	0.000	
Congressional Add: Program Increase - Programmable Computing Fabric Networks				2.414	2.500	
Congressional Add: Program increase - expeditionary UAS manufacturing and employment				0.000	10.000	
Congressional Add: Program increase - translate legacy software to usable code				0.000	5.000	
Congressional Add Subtotals for Project: 635321				24.629	27.500	
Congressional Add Totals for all Projects				24.629	27.500	
<u>Change Summary Explanation</u>						
In FY 2024, decrease of \$1.511M in Other Adjustments was due to realignment of funds to PE 0602212F, Defense Laboratories R&D Projects, to implement the Department of Defense (DoD) Funding Laboratory Enhancements Across Four Categories (FLEX-4) authority under 10 U.S.C Section 4123.						
The FY 2026 request was reduced by \$0.562 million for Advisory and Assistance Services to promote efficiencies and advance the policies of the Administration in alignment with Executive Order 14222, "Implementing the President's Department of Government Efficiency Cost Efficiency Initiative."						

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 3					R-1 Program Element (Number/Name) PE 0603788F / Battlespace Knowledge Development and Demonstration				Project (Number/Name) 635321 / C4I Battlespace Dev and Demo			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
635321: C4I Battlespace Dev and Demo	0.000	47.273	44.425	18.155	0.000	18.155	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Note												
Within Project 635321, C4I Battlespace Dev and Demo, the following changes took place:												
In FY 2026, the "Multi-Domain Command and Control" effort will be renamed to the "Combined Joint All-Domain Command & Control" effort to more accurately capture its focus on enhancing support for joint operations.												
In FY 2026, the work and funding associated with the "Data to Decisions" and the "Game Changing Computing Power" efforts will be consolidated into the "Multi-Domain Sensemaking" effort to foster greater integration of extreme computing and data processing, fusion, exploitation, and analysis for advanced technological development.												
A. Mission Description and Budget Item Justification												
This project supports the Department of the Air Force's (DAF) strategic objectives by advancing cutting-edge research technologies critical for achieving multi-domain superiority and operational agility across the full spectrum of military operations. Specifically, it enables the DAF and DoD to: (1) develop and implement Combined Joint All-Domain Command and Control (CJADC2) capabilities, ensuring seamless integration across land, air, space, and cyber domains for effective joint decision making, command, and operational execution; (2) field and sustain assured, resilient, and high-capacity communications and networks, providing enduring support for global, persistent, and survivable military operations—both kinetic and non-kinetic—critical to maintaining a strategic advantage and operational continuity in contested environments; and 3) design and deploy advanced systems to process, fuse, and exploit real-time data from diverse sources, empowering decision-makers with enhanced situational awareness and enabling rapid, data-driven decisions to outpace adversaries.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2024	FY 2025	FY 2026	
Title: Combined Joint All-Domain Command & Control									10.854	4.780	5.947	
Description: In FY 2026, the "Multi-Domain Command and Control" effort will be renamed to the "Combined Joint All-Domain Command & Control" effort to more accurately capture its focus on enhancing support for joint operations.												
Develop and demonstrate technologies that enable faster and more informed decision-making in contested environments across all domains (air, land, maritime, space, cyber). Artificial intelligence (AI), autonomy, and machine learning (ML) are leveraged when advantageous for enhanced planning and battle management capabilities for optimized situational awareness; seamlessly integrating with joint forces in real-world operations creating a comprehensive battlespace picture that will enable rapid assessment of threats and opportunities.												

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 3		R-1 Program Element (Number/Name) PE 0603788F / <i>Battlespace Knowledge Development and Demonstration</i>		Project (Number/Name) 635321 / <i>C4I Battlespace Dev and Demo</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
FY 2025 Plans: - Initiate advanced development and demonstration of a triple component system to support both single Joint Air-to-Surface Standoff Missile (JASSM) and multi-JASSM planning from airborne platforms. - Initiate advanced development and demonstration of an an Artificial Intelligence (AI)-enhanced planning capability and battle management architecture at a relevant AF exercise with operationally relevant data to support a common operational picture for selection, tracking, and deployment of AI capabilities in-mission. - Complete demonstration of communication, information management, and replication capabilities for intra-base distribution of Command and Control (C2) operational echelon kits for rapid distribution and dispersion of Air Operations Center functions theater-wide. - Complete execution of experiments, based on operational scenarios, which incorporate process management execution into the extensible Space command and control framework, and which integrate disparate data and applications, providing a pedigree for proposed tasking options to decision makers. - Complete development of tools, technology, and a framework for execution management of operational center process workflows and applications. - Complete demonstration of a fused installation security architecture- air, ground, and cyber, multi-mission Unmanned Air System (UAS) "wingmen" for installation security capabilities. - Complete development of robust artificial intelligence/machine learning for targeted transition capabilities. - Complete development and implementation of state of the art learning models. - Complete integration within the StreamlinedML framework. - Complete implementation and testing of neuromorphic based algorithms for processing and exploitation of multiple data feeds. FY 2026 Plans: -Continue advanced development and demonstration of an an Artificial Intelligence (AI)-enhanced planning capability and battle management architecture at a relevant AF exercise with operationally relevant data to support a common operational picture for selection, tracking, and deployment of AI capabilities in-mission, focusing on demonstrating speech-to-text models and tactical operations centers in operationally relevant environments. -Complete advanced development and demonstration of a triple component system to support both single Joint Air-to-Surface Standoff Missile (JASSM) and multi-JASSM planning from airborne platforms, including small-scale Standoff Munition Application Center (SMAC) exercise and large SMAC planning exercise. FY 2025 to FY 2026 Increase/Decrease Statement:					

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603788F / <i>Battlespace Knowledge Development and Demonstration</i>	Project (Number/Name) 635321 / <i>C4I Battlespace Dev and Demo</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
FY 2026 funding increased compared to FY 2025 by \$1.167 million due to greater emphasis for all-domain resilient command & control capabilities in collaboration with the Program Executive Office Command, Control, Communications, and Battle Management (PEO C3BM) and the DAF Battle Network.			FY 2026
Title: Multi-Domain Sensemaking Description: In FY 2026, the work and funding associated with the "Data to Decisions" effort and the "Game Changing Computing Power" effort within this project will be merged into the "Multi-Domain Sensemaking" effort to promote deeper integration of battlespace awareness and extreme computing technologies and accelerate technological development. Develop and demonstrate technologies to aggregate, fuse, exploit and analyze disparate data from all operational domains (land, sea, air, space, cyber) to generate a real-time understanding of the battlespace. When advantageous Artificial Intelligence (AI), Autonomy, and Machine Learning (ML) are leveraged to enable rapid identification of threats, opportunities, and emergent patterns that will provide actionable insights to decision-makers, ultimately enhancing situational awareness, accelerating decision cycles, and improving overall operational effectiveness in complex, multi-domain environments. FY 2025 Plans: In FY 2025 and prior years, the plans and funding were reported in the "Data to Decisions" effort (FY 2025: \$3.430M) and "Game Changing Computing Power" effort (FY 2025: \$1.833M). Total combined FY 2025 funding is \$5.263M. FY 2026 Plans: -Initiate processing at the edge to securely provide real-time analysis of mission data; deploying artificial intelligence, machine learning, and automation to support dynamic mission planning and enhanced situational awareness; focusing on developing and demonstrating an embedded high performance computing system that simultaneously processes Multi-INT data on airborne platforms to autonomously identify and classify objects of interest. -Initiate the development of a technology analysis solution to identify feasible technology required to support future combat assessment operating concepts, focusing on delivering a functional decomposition of combat assessment captured in a modeling language. -Initiate advanced development and demonstration of multimodal, interoperable veracity assessment tools, capable of accurately evaluating the credibility of Publicly Available Information from various modalities (audio, video, text, and IoT devices), and integrating with traditional ISR sources, focusing on developing and refining algorithms for the fusion and clustering of multi-source data, and methods of verification.		0.000	0.000
			6.082

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603788F / Battlespace Knowledge Development and Demonstration	Project (Number/Name) 635321 / C4I Battlespace Dev and Demo		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
-Continue integration of targeting and communications technologies for rapid dynamic targeting of high-mobility enemy threat systems, focusing on interoperability between technologies and developing and demonstrating targeting and automated battle damage assessment (BDA) capabilities. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 increased compared to FY 2025 by \$6.082 due to the following: 1) consolidation of work and funding from the "Data to Decisions" effort (\$3.430 million) and the "Game Changing Computing Power" effort (\$1.833 million), and 2) \$0.819 million increase for advanced development and demonstration of combat assessment to identify future challenges, operating concepts, and technology solutions for combat assessment capabilities.				
Title: Data to Decisions Description: In FY 2026, the work and funding associated with the "Data to Decisions" effort within this Project will be merged into the "Multi-Domain Sensemaking" effort to promote deeper integration of data processing, fusion, exploitation, & analysis and accelerate technological development. Develop and demonstrate the collection, management, analysis, and exploitation of complex data for availability to Air Force and other stakeholders. FY 2025 Plans: - Initiate integration of targeting and communications technologies for rapid dynamic targeting of high-mobility enemy threat systems, focusing on interoperability between technologies. - Complete development and demonstration of intelligence analysis capabilities from multiple intelligence sources for both near-real time and post mission. - Complete research and development in data analytics and strategic indications and warnings for the air and space domains. - Complete performing service-based capability development. - Complete software development for automatic detection, characterization, and classification of relative maneuver behaviors between multiple resident space objects. FY 2026 Plans: In FY 2026 and out, the plans and funding associated with this effort will be merged into the Multi-Domain Sensemaking effort within Project 635321, C4I Battlespace and Demo, to promote deeper integration of data processing, fusion, exploitation, & analysis to accelerate technological development. FY 2025 to FY 2026 Increase/Decrease Statement:		2.444	3.430	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603788F / <i>Battlespace Knowledge Development and Demonstration</i>	Project (Number/Name) 635321 / <i>C4I Battlespace Dev and Demo</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
FY 2026 funding decreased compared to FY 2025 by \$3.430 million due to the transfer of the work and funding associated with this effort into the "Multi-Domain Sensemaking" effort within Project 635321, C4I Battlespace Dev and Demo, to promote deeper integration of data processing, fusion, exploitation, & analysis to accelerate technological development.			FY 2026
Title: Game Changing Computing Power Description: In FY 2026, the work and funding associated with the "Game Changing Computing Power" effort within this project will be merged into the "Multi-Domain Sensemaking" effort to promote deeper integration of extreme computing and accelerate technological development. Develop and demonstrate computer architectures with greater capacity and sophistication to enable game-changing computing power to the warfighter anywhere, anytime. FY 2025 Plans: - Complete demonstration of secure, on-board, simultaneous processing of multi-INT data to correlate and identify surface targets. - Complete development of artificial intelligence/machine learning for data sources with correlation and automated alerts to enable human-machine tip and cue on surrogate platform. FY 2026 Plans: In FY 2026 and out, the plans and funding associated with this effort will be merged into the "Multi-Domain Sensemaking" effort within Project 635321, C4I Battlespace and Demo, to promote deeper integration of extreme computing and accelerate technological development. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 funding decreased compared to FY 2025 by \$1.833 million due to the transfer of the work and funding associated with this effort into the "Multi-Domain Sensemaking" effort within Project 635321, C4I Battlespace Dev and Demo, to promote deeper integration of extreme computing to accelerate technological development.		2.805	1.833
Title: Assured Communications & Networks Description: Develop and demonstrate secure and reliable communications to ensure the delivery of timely, reliable, and actionable information to warfighters and systems. Improve the understanding of operational impacts of compromised communications across various domains and platforms, using diverse network connections, strengthening resilience in contested environments. Strengthen situational awareness in austere or disaster-recovery environments by further developing and demonstrating a compact, deployable information management system capable of prioritizing, compressing, and caching data over limited bandwidth connections. Boost communications capability in contested/denied/degraded environments by providing resilient, high-performance programmable communications customizable to mission needs.		6.541	6.126

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force			Date: June 2025		
Appropriation/Budget Activity 3600 / 3		R-1 Program Element (Number/Name) PE 0603788F / <i>Battlespace Knowledge Development and Demonstration</i>		Project (Number/Name) 635321 / <i>C4I Battlespace Dev and Demo</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2024	FY 2025	FY 2026
FY 2025 Plans: - Initiate the development of a low SWaP rapidly deployable information management system and development of a capability to support data compression, mission prioritization, & intelligent caching over high and low-capacity data links. - Complete development and demonstration for rapid waveform development of multi-mission software defined radio frequency capability. - Complete development of wideband high frequency waveform development and testing. - Complete development of enhancing communication link availability prediction for better Command, Control, and Communications planning and simulation. - Complete demonstration of a protected, single security domain commercial off-the-shelf device hosting user and asset tracking.					
FY 2026 Plans: -Initiate advanced development and demonstration of a framework to analyze and evaluate the impacts of degraded/denied/ detected connectivity across multi-domain mission threads utilizing heterogenous links, focusing on building the software environment and links connecting multiple networks, building initial scenarios and mission threads. -Initiate the development of a multi-spectral, deployable communications system providing high capacity, assured connectivity, focusing on conducting a demonstration for advanced waveform diversity mesh networking capability for survivability in a degraded/destroyed environment. -Continue the development of a low size, weight, and power (SWaP) rapidly deployable information management system and development of a capability to support data compression, mission prioritization, & intelligent caching over high and low-capacity data links, focusing on conducting demonstrations with multiple waveforms & networks with operationally relevant data, leveraging the mesh networking concept in disaster recovery settings.					
FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 funding decreased compared to FY 2025 by \$0.756 million due to a decrease in investments for a deployable information management system and to properly align programming with execution.					
Accomplishments/Planned Programs Subtotals			22.644	16.925	18.155
			FY 2024	FY 2025	
Congressional Add: Program Increase - Antenna Form Factor Development for Assured Communications and Networks			19.319	0.000	
FY 2024 Accomplishments: Conducted congressionally directed efforts.					
FY 2025 Plans: Not applicable					
Congressional Add: Program Increase - B-52 Agile Pod Capability			1.931	10.000	

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603788F / <i>Battlespace Knowledge Development and Demonstration</i>	Project (Number/Name) 635321 / <i>C4I Battlespace Dev and Demo</i>

	FY 2024	FY 2025
FY 2024 Accomplishments: Conducted congressionally directed efforts.		
FY 2025 Plans: Conduct congressionally directed efforts.		
Congressional Add: Program Increase - Nationwide Integration of Time Resiliency for Operations	0.965	0.000
FY 2024 Accomplishments: Conducted congressionally directed efforts.		
FY 2025 Plans: Not applicable		
Congressional Add: Program Increase - Programmable Computing Fabric Networks	2.414	2.500
FY 2024 Accomplishments: Conducted congressionally directed efforts.		
FY 2025 Plans: Conduct congressionally directed efforts.		
Congressional Add: Program increase - expeditionary UAS manufacturing and employment	0.000	10.000
FY 2024 Accomplishments: Not applicable		
FY 2025 Plans: Conduct congressionally directed efforts.		
Congressional Add: Program increase - translate legacy software to usable code	0.000	5.000
FY 2024 Accomplishments: Not applicable		
FY 2025 Plans: Conduct congressionally directed efforts.		
Congressional Adds Subtotals	24.629	27.500

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

Remarks

D. Acquisition Strategy
 Not applicable

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600 / 3					R-1 Program Element (Number/Name) PE 0603788F / Battlespace Knowledge Development and Demonstration				Project (Number/Name) 635329 / Cyber Battlespace Dev & Demo			
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
635329: Cyber Battlespace Dev & Demo	0.000	12.338	9.247	12.657	0.000	12.657	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project supports the Department of the Air Force's (DAF) strategic objectives by advancing cutting-edge research technologies critical for achieving The Department of the Air Force (DAF) requires the development and deployment of advanced cyber capabilities to ensure superiority in both offensive and defensive operations, as well as to maintain resilience in contested cyber environments.

This includes:

- 1) Cyber offense capabilities - enabling access, stealth, and persistence within adversary networks, while leveraging advanced intelligence collection and non-kinetic weapons to disrupt, degrade, or destroy enemy capabilities, ensuring strategic advantage in both peacetime and conflict scenarios.
- 2) Cyber defense capabilities - establishing robust defenses to detect, attribute, and respond to cyberattacks, ensuring the integrity of critical systems, networks, and data, while actively mitigating threats and neutralizing adversary attempts to compromise U.S. cyber infrastructure.
- 3) Cyber resilience - developing systems and protocols for rapid adaptation, recovery, and sustained survivability of critical assets and operations, ensuring the DAF can continue to function effectively even in the face of sophisticated and persistent cyber threats.

The efforts in this Project directly support the DAF's and DoD's imperative to secure and maintain dominance in the cyber domain, ensuring the operational continuity and effectiveness of military forces across all domains, both in peacetime and in conflict.

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

	FY 2024	FY 2025	FY 2026
Title: Cyber Defense Technologies	1.864	0.000	0.000
Description: In FY 2025 and out, this research will be integrated into the "Cyber Offensive and Defensive Technologies" effort within this Project.			
Develop and demonstrate defensive cyber operations capabilities in a series of experimental technology demonstrations.			
FY 2025 Plans: In FY 2025 and out, the work and plans under this effort are reported in the "Cyber Offensive and Defensive Technologies" effort within this Project.			
FY 2026 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603788F / <i>Battlespace Knowledge Development and Demonstration</i>	Project (Number/Name) 635329 / <i>Cyber Battlespace Dev & Demo</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
Not applicable			
FY 2025 to FY 2026 Increase/Decrease Statement: No work or funding is planned in either FY 2025 or FY 2026 for this thrust.			
Title: Cyber Offense Technologies Description: In FY 2025 and out, this research will be integrated into the "Cyber Offense and Defensive Technologies" effort within this Project. Develop and demonstrate offensive cyber operations capabilities in a series of experimental technology demonstrations. FY 2025 Plans: In FY 2025 and out, the work and plans under this effort are reported in the "Cyber Offense and Defensive Technologies" effort within this Project. FY 2026 Plans: Not applicable FY 2025 to FY 2026 Increase/Decrease Statement: No work or funding is planned in either FY 2025 or FY 2026 for this thrust.		10.474	0.000
Title: Cyber Offense and Defensive Technologies Description: For FY 2024 and prior years, these activities were performed in the "Cyber Defense Technologies" and "Cyber Offense Technologies" efforts within this Project. Develop and demonstrate cyber warfighting, assurance, and electromagnetic (EM) convergence capabilities in a series of experiments in operationally relevant environments. Enhance situational awareness and operational effectiveness by automating Radio Frequency (RF) spectrum monitoring and analysis, enabling faster and more efficient identification of threats, friendly forces, and spectrum usage patterns. Advance 5G cyber capabilities through a modular and scalable tool suite, enabling flexible and adaptable cyber operations in 5G-enabled environments and demonstrating the exploitation of 5G signals for intelligence gathering and offensive cyber operations. Improve counter-small unmanned aerial system (C-sUAS) capabilities by developing an open architecture specification that fosters interoperability between diverse protection systems, enabling a more integrated and effective defense against C-sUAS threats. FY 2025 Plans: - Initiate development of 5G cyber operations tool suite for integration into DAF cyber operations platforms.		0.000	9.247
			12.657

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603788F / <i>Battlespace Knowledge Development and Demonstration</i>	Project (Number/Name) 635329 / <i>Cyber Battlespace Dev & Demo</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Initiate development of 5G exploitation tools for Intelligence, Surveillance, and Reconnaissance (ISR) and for Offensive Cyber Operations (OCO) capabilities. - Continue the development of a counter small unmanned aerial system open architecture specification to enable interoperability between disparate protection systems. - Continue integration and transition of multiple Air Force Research Laboratory and Air Force Lifecycle Management Center counter small unmanned aerial system capabilities. - Complete development of software capabilities and concept of operations for active guidance and automated processes addressing cyber defense. - Complete the demonstration of automated cyber survivability using integrated cyber technologies within the operational system laboratory in the context of risk management framework requirements. - Complete development of an advanced secure processor hardware capability. - Complete development, demonstration, and integration of the Project IKE Cyber system (an end-to-end military system and cyber mission execution framework). - Complete research into dynamic management tailored towards unmanned aerial systems. - Complete the advancement of research towards development of non-kinetic cyber effects against high-impact, critical targets within Areas of Responsibility or Areas of Interest to enable stand-off power projection options that enable cyber-only and coordinated cyber-kinetic target prosecution. - Complete development of signal identification capabilities in adverse environments addressing advanced communications signals and networks. - Complete development of a base-threat awareness toolkit. - Complete development of a processor-agnostic sub-system for golden-image storage, verification, and re-flashing. - Complete the development of a capability to enable the warfighter access into congested environments as directed by warfighter requirements. - Complete investments for the development of a cellular testbed with 5G and Internet of Things representative technologies. FY 2026 Plans: - Initiate advanced development and demonstration for methods and systems to automate the monitoring and characterization of geographic regions of the radio frequency (RF) spectrum, focusing on designing algorithms for automated spectrum characterization. - Continue development of 5G cyber operations tool suite for integration into DAF cyber operations platforms, focusing on developing and demonstrating modular, scalable framework. - Continue development of 5G exploitation tools for Intelligence, Surveillance, and Reconnaissance (ISR) and for Offensive Cyber Operations (OCO) capabilities, focusing on developing and demonstrating 5G signal testbeds and associated algorithms for identified signal types.			

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Exhibit R-2A, RDT&E Project Justification: PB 2026 Air Force		Date: June 2025	
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603788F / <i>Battlespace Knowledge Development and Demonstration</i>	Project (Number/Name) 635329 / <i>Cyber Battlespace Dev & Demo</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025
- Continue the development of a counter small unmanned aerial system open architecture specification to enable interoperability between disparate protection systems, focusing on the development and standardization of radio frequency (RF), autonomy & data fusion, physical response, and detect/track/defeat of swarms to advance interoperability across multiple systems. - Complete integration and transition of multiple Air Force Research Laboratory and Air Force Lifecycle Management Center (AFLCMC) counter small unmanned aerial system (C-sUAS) capabilities.			
<i>FY 2025 to FY 2026 Increase/Decrease Statement:</i> FY 2026 funding increased compared to FY 2025 by \$3.410 million due to an increase in investments in frequency spectrum monitoring & characterization algorithm development and integrated multi-domain theater-level cyberspace operations.			
Accomplishments/Planned Programs Subtotals		12.338	9.247
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
Not applicable			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)					R-1 Program Element (Number/Name) PE 0604776F I Deployment & Distribution Enterprise R&D							
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
Total Program Element	0.000	0.000	19.441	28.316	0.000	28.316	-	-	-	-	-	-
630004: Deployment and Distribution Development & Proto	0.000	0.000	19.441	28.316	0.000	28.316	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 3, PE 0604776F, project 630004, Contested Logistics Ops By Robots for Expeditionary Recon, is a new start.
This program, BA 3, PE 0604776F, project 630004, Integrated Communications and Mission Planning for Autonomous Resupply Systems, is a new start.
This program, BA 3, PE 0604776F, project 630004, Integrating Space Transportation for USTRANSCOM Cargo Transport, is a new start.
This program, BA 3, PE 0604776F, project 630004, Rapid Aircraft Load Planner Handheld (RALPH), is a new start.
This program, BA 3, PE 0604776F, project 630004, Small Unit Resupply Decision Dominance, is a new start.
This program, BA 3, PE 0604776F, project 630004, Synthetic Data Generation Engine, is a new start.
This program, BA 3, PE 0604776F, project 630004, Logistics Insights Networking and Collaboration (LINC), is a new start.

A. Mission Description and Budget Item Justification

In partnership with Services, Combatant Commands, OSD, select Defense Agencies, industry, and academia, this program collaboratively pursues the development, integration, field demonstration and assessment of contested logistics Joint Deployment and Distribution Enterprise (JDDE) and Joint Petroleum (JPE) capabilities. Contested logistics challenges include innovative projection and sustainment capabilities, seaport and airfield improvements, inventory/cargo management, materiel handling, cargo/container security, secure collaboration with commercial/interagency/coalition partners, and distributed global mobility C4. Intent is to improve the efficiency and effectiveness of logistics operations in support of the joint warfighter.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force				Date: June 2025			
Appropriation/Budget Activity		R-1 Program Element (Number/Name)					
3600: Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)		PE 0604776F I Deployment & Distribution Enterprise R&D					
B. Program Change Summary (\$ in Millions)		FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	
Previous President's Budget		0.000	27.762	28.403	0.000	28.403	
Current President's Budget		0.000	19.441	28.316	0.000	28.316	
Total Adjustments		0.000	-8.321	-0.087	0.000	-0.087	
• Congressional General Reductions		0.000	-8.321				
• 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	-0.087	0.000	-0.087	
Change Summary Explanation							
The FY 2025 Congressional Reduction of -\$8.321 million was the extension of FY 2024 HAC-D unjustified growth mark to FY 2025.							
C. Accomplishments/Planned Programs (\$ in Millions)					FY 2024	FY 2025	FY 2026
Title: TRANSCOM Innovation					0.000	0.202	0.263
Description: Annual investment in emerging technologies to enhance the ability to globally project and sustain the joint warfighter/ address Joint Deployment and Distribution Enterprise (JDDE) and Joint Petroleum Enterprise (JPE) challenges. Includes contribution to Small Business Innovative Research (SBIR) programs.							
FY 2025 Plans:							
Will use to funds, if available, to explore the use of autonomous low-profile vessels to perform joint sustainment as well as develop an expeditionary capability to effect large area damage repair to runways/airfields.							
FY 2026 Plans:							
Funds are used to support New Start research projects garnered via an annual March through October solicitation process. Funds also used to collaboratively invest/shape in the Office of the Undersecretary of Defense, Research & Engineering (OUSD(R&E)) programs (e.g., Defense Innovation Accelerator) proposals that address contested logistics challenges. On average, this line supports the funding of approximately six New Starts per year.							
FY 2025 to FY 2026 Increase/Decrease Statement:							
Average USTRANSCOM funded research project is three years in length. Portfolio contains 30+ active projects. The USTRANSCOM Innovation Unit line varies every year based on project execution (i.e., receipt of prior year funds is sometimes							

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0604776F / <i>Deployment & Distribution Enterprise R&D</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
delayed creating a slip in project execution) and applied economic adjustments. The \$0.061M increase reflects the difference in funding line from prior year.				
Title: Aerial Delivery and Autonomous Deployment of Unmanned Vehicles Joint Aerial Delivery Demonstration Exhibition (JADDE) Description: This funding supports the demonstration of funded airdrop capabilities. FY 2025 Plans: Funds use of test range facilities and test aircraft to support demonstrations. FY 2026 Plans: Funding shift to support the combined demonstration of multiple aerial delivery capabilities in an operational environment. FY 2025 to FY 2026 Increase/Decrease Statement: Decrease of \$0.100M due to maturing of project technology to BA04 funds with the demonstration of multiple aerial delivery capability enhancements in a single event.		-	0.100	0.000
Title: Contested Logistics Ops By Robots for Expeditionary Recon Description: A versatile, high speed, utilitarian craft with deployable bow ramp capable of delivering 14K / 20K of cargo over 400 nm to the littorals/ports at 20 kts in sea state 3. Technical Partner USCENTCOM. FY 2025 Plans: This is a FY 2026 New Start FY 2026 Plans: Completion & testing of Small High-speed Amphibious Role-variant Craft (SHARC) Prototype #2 (extended form factor to accommodate TRANSCOM funded/USMC owned Automated Pallet Loader (APL); retrofit of SHARC Prototype #1 with any equipment changes from Prototype #2 development; integration of the initial operating capability (IOC) of Government Off the Shelf (GOTS)/Commercial Off the Shelf (COTS) networking & collaborative & autonomy SW framework into Prototypes #1 & 2; demo craft functionality for both SHARCs plus IOC autonomy; initial Concepts of Operations (CONOPS)/Tactic Techniques and Procedures (TTP) development in representative operational scenarios & development of key performance parameters (KPPs) with Measures of Performance (MOPs)/Measures of Effectiveness (MOEs) for all demonstrated technologies. Technical Partner United States Central Command (USCENTCOM). FY 2025 to FY 2026 Increase/Decrease Statement:		-	0.000	1.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0604776F <i>I Deployment & Distribution Enterprise R&D</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
FY 2026 New Start funded with \$1.000 million, so no increase or decrease from FY 2025. Transition Strategy: USMC/USN/USA Program of Record (PoR).				
Title: Integrated Communications and Mission Planning for Autonomous Resupply Systems Description: Develop command & control (C2) software front-end plug-ins that will be compatible with extended range aerial delivery vehicles, integrated Mission Planning (MP) support that is interoperable with selected C2 platform(s) to enable near real time evaluation of mission progress leveraging vehicle performance models, airdrop models, and route optimization algorithms, C2 communications hardware (non-developmental/commercial off the shelf) including ground stations, radios, and vehicle hardware, and payload tracking, and Joint Precision Airdrop long-range software and hardware updates to support C2 interoperability. Technical Partner: U.S. Army Capabilities Development Command. FY 2025 Plans: This is a FY 2026 New Start FY 2026 Plans: Mission planning software required for extended range vehicles development. Interface plugin(s) for the selected C2 tool will be developed to facilitate data exchange/transfer between Airdrop Mission Planner and the C2 tool, and between the C2 tool and the selected vehicle platform(s). A C2 tool will be developed for integration with the mission planning software and the vehicle flight software. FY 2025 to FY 2026 Increase/Decrease Statement: This is a FY 2026 New Start funded with \$0.900 million so no increase/decrease between FY 2025 and FY 2026. Transition strategy: This project will transition/impact multiple services and up to three different vehicles: U.S. Army Product Manager Force Sustainment Systems (PdM-FSS) to support Joint Precision Airdrop (JPADS) 2 thousand/10 thousand and Long Range JPADS PoRs and expected Autonomous Extended Range Aerial Delivery System PoR.		-	0.000	0.900
Title: Integrating Space Transportation for USTRANSCOM Cargo Transport Description: Deliver mature prototypes of designs and system-level procedures for commercial space transportation integration with the Joint Deployment and Distribution Enterprise (JDDE). The objectives both leverage and augment the science and technology (S&T) development of the Air Force Research Lab/U.S. Space Force Rocket Cargo Vanguard program by accelerating technology transition and process development for use of space transportation in Joint operations. FY 2025 Plans: This is a FY 2026 New Start FY 2026 Plans:		-	0.000	0.711

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I</i> BA 3: <i>Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0604776F <i>I Deployment & Distribution Enterprise R&D</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
Report of knowledge acquisition findings/plan of action, C2 System Operational View (OV)-1 and OV-4, regulatory compliance mission assessment, and design factors report and network design. FY 2025 to FY 2026 Increase/Decrease Statement: This is a FY 2026 New Start funded with \$0.711 million, no increase/decrease. Transition Strategy: Transition efforts will be led by USSF Space Systems Command, in collaboration with USTRANSCOM, OSD, Joint Staff, and Headquarters Space Force (HQSF). As the Program Executive Officer (PEO) for space access, PEO Space Force's Assured Access to Space (AATS) is responsible for direction of the Point-to-Point Delivery (P2D) program office.				
Title: Rapid Aircraft Load Planner Handheld (RALPH) Description: Air distribution to remote, austere locations for small loads poorly suited to C-130 efficiency. Use of unmanned light aircraft for cargo movement to the tactical edge will call for non-aerial port personnel to perform basic aircraft loading and load planning. Employment of a customized tool supports system velocity. Project provides a unique, emerging Rapid Distribution Technology (a JDDE challenge), that directly supports the employment of uncrewed, optionally piloted aircraft for light cargo distribution and is particularly relevant to retrograde cargo operations. Technical partner United States Indo-Pacific Command (USINDOPACOM). FY 2025 Plans: This is a FY 2026 New Start FY 2026 Plans: Scanner functional to include weight entry and data table output, upper & lower cargo bays graphically defined (two aircraft), graphic load planner linked to data table, graphic load planner linked to data table, and field testing complete by operational units. FY 2025 to FY 2026 Increase/Decrease Statement: This is a FY 2026 New Start funded with \$0.600 million, no increase/decrease. Transition strategy: With the Pacific Autonomous Aircraft Capability - Light Intra-Theater Logistic (PAAC-LITL) effort getting fully underway under the auspices of Pacific Air Forces Operations Directorate (PACAF A3) and the Logistics, Engineering, and Force Protection Directorate (PACAF A4) in FY25, the natural transition target is PACAF. Transition path likely found in treating RALPH as a simple tool that can be secured by users as a General Services Administration (GSA) commodity.		-	0.000	0.600
Title: Small Unit Resupply Decision Dominance Description: An integrated and automated resupply planning and execution system that streamlines and accelerates the responsiveness of emergency aerial resupply by minimizing human in the loop decision making. Project facilitates rapid/accurate decision making, at the tactical edge. Technical partner U.S. Army Capabilities Development Command.		-	0.000	0.960

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0604776F <i>I Deployment & Distribution Enterprise R&D</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
FY 2025 Plans: This is a FY 2026 New Start FY 2026 Plans: Development that will first allow the sustainment support personnel to establish a vehicle inventory at the field level, capturing information such as vehicle type, serial number, mission readiness, and location. The specific vehicle being used for a given resupply mission will now be selectable within the mission profile, which results in the ability to monitor the fleet of resupply vehicle availability for current and future operations. FY 2025 to FY 2026 Increase/Decrease Statement: This is a FY 2026 New Start funded with \$0.960 million, no increase/decrease. Transition strategy: This project has targeted a transition to U.S. Army Program Executive Office (PEO) Soldier Project Manager Soldier Warrior (PM SWAR). This project directly supports the PEO Soldier's requirement for Small Unit Resupply (SUR) and SUR Decision Dominance, documented as a need within Project Polaris, Close Combat Integration Enterprise Modernization Plan 2024.				
Title: Synthetic Data Generation Engine Description: Developing a capability to rapidly generate unclassified data that has a similar structure to existing classified data sets within the command. This automatic data generation framework will allow for the creation of large, synthetic data sets that can be used for a variety of purposes, including training exercises, system testing, and other activities that require data that is not necessarily identical to current operational data. FY 2025 Plans: This is an FY26 New Start FY 2026 Plans: Identify and document a detailed data-driven use case that could benefit from synthetic data generation, collect and analyze real data (if available) to understand characteristics and underlying patterns, document potential techniques and tools for synthetic data generation, and develop an initial prototype focusing on simple synthetic data generation techniques. FY 2025 to FY 2026 Increase/Decrease Statement: This is an FY 2026 new start funded with \$0.362 million, so no increase/decrease. Transition strategy: The expected transition of the synthetic data generation engine will be targeted to a cloud-based USTRANSCOM development/test environment, following any applicable Risk Management Framework (RMF) processes, in preparation for release to a production-level development or maintenance project for final operational deployment.		-	0.000	0.362
Title: Logistics Insights Networking and Collaboration (LINC)		-	0.000	0.700

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I</i> BA 3: <i>Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0604776F <i>I Deployment & Distribution Enterprise R&D</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
Description: Demonstrate a proof-of-concept architecture facilitating end-to-end bi-directional linkages between selected tactical and operational tools. This approach ensures end users retain access to tools tailored to their needs while benefitting from the cumulative wisdom of networked tools. Technical partner United States Marine Corps. FY 2025 Plans: This is a FY 2026 New Start FY 2026 Plans: Kick off meeting report and briefing slides detailing stakeholder input, user requirements and any adjustments to project schedule, and technical documentation for individual partner models. FY 2025 to FY 2026 Increase/Decrease Statement: This is a FY 2026 New Start funded with \$0.700M, so no increase/decrease. Transition Strategy: Two main transition pathways for LINC. First, given the collaborative nature of this joint proposal, the preferred strategy is for the cost of sustaining LINC be shared between the Programs of Record to which the partner tools transition. These could include United States Special Operations Command (USSOCOM) Digital Applications and USMC Expeditionary Energy Office, which are already actively engaged in Supply Chain Analytics, Visualization, Exploitation, Network and Geolocation Resource (SCAVENGeR) and Logistics Bulk-fuel Expeditionary Analysis & Simulation Tool (LOG-BEAST) respectively. This would make LINC available across Services, with cost-sharing for sustainment and further development shared between partners.				
Title: Component-level Operational Decision Advantage Description: Component-level Air Forces (AFFOR) Command and Control and processes for full-spectrum competition against high end adversaries. CODA will leverage prior AFRL research, organizational development techniques, and state of the art technologies to equip the AFFOR with capabilities which contribute to closing this performance gap and enabling USTRANSCOM's air component to meet anticipated and emerging maneuver requirements of the joint force. Develop detailed decision support tool that provides insight at the component level. Technical partner is U.S. Air Force Research Lab. FY 2025 Plans: Design principles and conceptual prototypes and identify applications and data that can be leveraged. FY 2026 Plans: In FY 2026, PE 0604776F, (Deployment & Distribution Enterprise R&D), Project 630004, (Deployment and Distribution & Prototyping) efforts were transferred to PE 0604776F, (Deployment & Distribution Enterprise R&D), Project 640216, (Deployment and Distribution Innovation) to align with funding with component development and prototypes in a high fidelity and realistic		0.000	1.851	0.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0604776F <i>I Deployment & Distribution Enterprise R&D</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
operating environment. Transition to Program Executive Office for Digital and Enterprise Services-supported life-cycle maintenance.				
FY 2025 to FY 2026 Increase/Decrease Statement: The FY 2026 funding decrease of \$1.851 million is a result of the project completing simulated testing and transferring efforts to an operational environment.				
Title: Distributed Littoral Ops Fuel Transfer		0.000	0.045	0.600
Description: A system that is lightweight, compact, and readily deployable in expeditionary operations and enables the quick deployment of fuel hoses for ship-to-shore transfer of bulk petroleum in friendly or contested environments. Technical Lead Naval Surface Warfare Center Carderock.				
FY 2025 Plans: Construct a bench level prototype of wench system. Project completes. Transition to USN Joint Petroleum Over-The-Shore.				
FY 2026 Plans: Continue work to construct a bench level prototype of wench system. Project completes. Transition to USN Joint Petroleum Over-The-Shore.				
FY 2025 to FY 2026 Increase/Decrease Statement: The FY 2026 funding increase of \$0.555M since project shifted majority of prototype development work to FY 2026. Transition to USN Joint Petroleum Over-The-Shore.				
Title: Airdrop Mission Planner Multiservice Interoperability		0.000	0.500	0.000
Description: Develop Android Tactical Assault Kit (ATAK) and Windows Tactical Assault Kit (WINTAK) for United States Army (USA), Air Force (USAF), Marine Corps (USMC), Special Operations Command (USSOCOM) and other services or organizations conducting airdrop operations. Lead technical partner is U.S. Army Combat Development Command.				
FY 2025 Plans: Streamline multiservice TTPs and regulation/instruction through the technical implementation.				
FY 2026 Plans: In FY 2026, PE 0604776F, (Deployment & Distribution Enterprise R&D), Project 630004, (Deployment and Distribution & Prototyping) efforts were transferred to PE 0604776F, (Deployment & Distribution Enterprise R&D), Project 640216, (Deployment and Distribution Innovation) to align with funding for software testing in simulated operational environment and validated against				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0604776F <i>I Deployment & Distribution Enterprise R&D</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
existing approved mission planning system. Transition to U.S. Army PEO Soldier Clothing & Individual Equipment (SCIE) Parachute Navigation System. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2026 funding decrease of \$0.500M due maturing of protype devolopment in a high fidelity and realistic operating environment and subsequent funding with BA 04 dollars.				
Title: End-to-End Distribution Modeling Description: Developing USTRANSCOM's model of record for all programmatic analysis for transportation/distribution. FY 2025 Plans: Continue to provide research and development to design and prototype foundational level changes to the Analysis of Mobility Platform (AMP) simulation engine necessary to provide the appropriate framework to accommodate challenging capability requirements for evolving Concepts of Operations (CONOPS), as well as to position the tool well to advance and sustain analytic capabilities. FY 2026 Plans: Spiral integration of capabilities and continue to provide research and development to design and prototype foundational level changes to the AMP-Core simulation engine necessary to provide the appropriate framework to accommodate challenging capability requirements for evolving CONOPs, as well as to position the tool well to advance and sustain analytic capabilities. FY 2025 to FY 2026 Increase/Decrease Statement: Increase of \$0.880 million back to original annual budget due to reduced FY 2025 development schedule. Transition to USTRANSCOM's AMP PoR.		0.000	0.880	1.760
Title: Autonomous Pallet Loader Description: A highly transportable, heavy-lift, autonomous material handling system. Technical Partner U.S. Army Combat Development Command. FY 2025 Plans: Update the mechanical and electrical sub-system designs. FY 2026 Plans:		0.000	0.450	1.200

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0604776F <i>I Deployment & Distribution Enterprise R&D</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
Develop and test autonomy to enable a highly distributed material handling capability supporting tactical and strategic aircraft. Modifications will be made to reduce the overall system weight to 10,000 lbs. The forklift mast will be modified to increase the height from 50" to 75". The forks will be modified to accommodate the handling of large munitions. FY 2025 to FY 2026 Increase/Decrease Statement: The FY 2026 funding increase of \$0.750 million is a result of the planned first full year project development and test scheduling. Transition to Marine Corps Systems Command.				
Title: Information Summarization for Complex Knowledge Management Description: Create succinct summaries of related information samples, facilitating improved information discovery and understanding. FY 2025 Plans: Documentation describing identified use case(s) and challenges the prototype will address.# Documentation of the end-to-end process of gathering, organizing, and refining data from multiple sources. FY 2026 Plans: Research suitable event correlation methods. Develop algorithm or method to correlate summarized text into events. Collect and organize data from diverse media sources, perform thorough cleaning, preprocessing, and tokenization, and identify and extract key features for summarization. FY 2025 to FY 2026 Increase/Decrease Statement: The FY 2026 funding increase of \$0.470 million is a result of planned first full year of project development and project scheduling. Transition to USTRANSCOM Enterprise Cloud Environment.		0.000	0.100	0.570
Title: Internal Sling-load Unit Airdrop Description: Capability to airdrop the Internal airlift/helicopter Slingable-Container Unit (ISU) from large, fixed-wing mobility aircraft. Technical Partner U.S. Army Combat Development Command. FY 2025 Plans: Develop ISU Airdrop Kit and ground testing FY 2026 Plans:		0.000	0.400	1.694

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0604776F <i>I Deployment & Distribution Enterprise R&D</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
Airdrop Flight Testing. Execute flight testing of the ISU Airdrop capability from USAF C-130 and/or C-17 aircraft. Testing will consist of three (3) flight test weeks at U.S. Army Yuma Proving Ground. Technical Partner U.S. Army Combat Development Command. FY 2025 to FY 2026 Increase/Decrease Statement: The FY 2026 funding increase of \$1.294 million is a result of planned first full year of project development and project progression. Transition to US Army Product Manager Force Sustainment Systems (PM FSS) as a new capability for the Rapid Rigging & Derigging Airdrop System (RRDAS) Program of Record.				
Title: Jet Augmented Glider Description: An autonomous long-range, low-cost, one-time use powered glider resupply vehicle which can be deployed from cargo aircraft, rotorcraft, ships, or from the ground. Technical Partner U.S. Army Combat Development Command. FY 2025 Plans: Design review and follow on design and develop a one-half scale ground launch test FY 2026 Plans: Deliverable a full-scale ground launch test and begin flight testing. Testing to be conducted to demonstrate the Jet Augmented Glider Uncrewed Aerial Response-eXtra Performance (JAGUAR-XP's) full 1600lb payload capacity, maximum range, and integration of DoD owned Joint Precision Airdrop System (JPADS) software and Global Positioning System (GPS) denied capabilities. FY 2025 to FY 2026 Increase/Decrease Statement: The FY 2026 funding increase of \$0.820 million is a direct result of the planned first full year of development submitted by project owners. Transition to Autonomous Extended Range Aerial Delivery System.		0.000	0.800	1.620
Title: Sustainment Support Network for Autonomous Aerial Resupply Vehicles Description: Integrated solution that automatically sources, processes, synthesizes, and distributes data to aerial resupply vehicles. Technical Partner U.S. Army Combat Development Command. FY 2025 Plans: Data Collection and Integration involves thoroughly understanding the data formats and interfaces of the following existing GOTS products and subsystems. FY 2026 Plans:		0.000	0.300	1.500

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0604776F / <i>Deployment & Distribution Enterprise R&D</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
Data synthesis algorithm construction involves the creation of an overarching algorithm that will automatically source, process, and synthesize data from the sources identified.				
FY 2025 to FY 2026 Increase/Decrease Statement: The FY 2026 funding increase of \$1.200 million is a result of the planned first full year project development. Transition to US Army PM FSS JPADS 2klb PoR.				
Title: System for Expeditionary Port Assessment and Repair/Containerized Agile Expeditionary & Rapid Beach Prep (CONAER) Description: Joint capability to counter asymmetric A2/AD seaport degradation activities by building on a suite of demonstrated port assessment and pier repair tools. Technical Partner Engineering Research and Development Command.		0.000	0.500	1.250
FY 2025 Plans: Architecture design and testing. The first phase develops the web apps and computer framework.				
FY 2026 Plans: Develop Web-based computer platform. This includes development of the apps and includes CONUS testing to push the TRL to level 5. At this level there will be moderate data integration across the apps. Technical Partner Engineering Research and Development Command.				
FY 2025 to FY 2026 Increase/Decrease Statement: The FY 2026 funding increase of \$0.750 million is a result of planned first full year of project development and scheduling submitted by project owners. Transition to Program Executive Office Enterprise Information Systems.				
Title: Aerial Delivery - Low Cost Modular GPS Denied Kit Description: Demonstrate a low size, weight, power and cost kit that can provide GPS-denied navigation, aerial delivery platforms. Technical Partner U.S. Army Combat Development Command.		0.000	1.500	1.269
FY 2025 Plans: Develop GPS denied software.				
FY 2026 Plans: Flight computer integration that includes six-month sprints that will be executed in which each capability will be incrementally added to the hardware/software baseline.				
FY 2025 to FY 2026 Increase/Decrease Statement:				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force		Date: June 2025		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I</i> BA 3: <i>Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0604776F <i>I Deployment & Distribution Enterprise R&D</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
The FY 2026 funding decrease of \$0.231 million is a result of project development plan and scheduling. Funding transfers to BA 04 funding to complete demonstrations in an operational environment. Transition to Army/USMC/SOCOM Joint Precision Airdrop System PoRs.				
Title: Airdrop System - Precision Extended Glide Description: Demonstrate a long range powered parafoil system to reduce risk to delivery aircraft. Technical lead U.S. Army Combat Development Command. FY 2025 Plans: Component integration and development and initial flight testing. In FY 2026, PE 0604776F, (Deployment & Distribution Enterprise R&D), Project 630004, (Deployment and Distribution & Prototyping) efforts were transferred to PE 0604776F, (Deployment & Distribution Enterprise R&D), Project 640216, (Deployment and Distribution Innovation) to align with funding with component development and prototypes in a high fidelity and realistic operating environment. FY 2025 to FY 2026 Increase/Decrease Statement: The FY 2026 funding decrease of \$0.800 million is a result of the project completing simulated testing and transferring efforts to an operational environment. Transition to Army/USMC/SOCOM Joint Precision Airdrop System PoRs.		0.000	0.800	-
Title: Automatic Landing Zone Description: Aid selection of a Landing Zone/Drop Zone (LZ/DZ) by presenting the user with a map-based course of action decision tool, at point of need. Technical Partner U.S. Army Combat Development Command. FY 2025 Plans: Develop system to provide user map-based course of action decision tool for LZ/DZ selection. FY 2026 Plans: Machine learning algorithm construction and integration. Algorithms will need to be trained to function properly. The data supplied to the algorithm will help shape the algorithm's performance. Prove ability to show the algorithm images with buildings labeled and to characterize these labels as areas in which no landing or flight can occur. FY 2025 to FY 2026 Increase/Decrease Statement: The FY 2026 funding increase of \$0.784 million is a result of full year project development plan and scheduling. Transition to U.S. Army Airdrop Mission Planning Website, USAF Consolidated Airdrop Tool (CAT) Program of Record, Net Warrior.		0.000	0.250	1.034
Title: Container Airdrop		0.000	0.533	0.965

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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0604776F <i>I Deployment & Distribution Enterprise R&D</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
Description: Enable the airdrop of a standard 20ft ISO container from a C-17 utilizing standard low altitude airdrop methods. Technical Partner U.S. Army Combat Development Command. FY 2025 Plans: Begin integration and development plan of components for airdrop testing. FY 2026 Plans: Identify potential payloads that would fit within the container, be survivable in airdrop, and find benefit from being transported and airdropped within a container. Select at least one payload (or more if possible) for demonstration during one of the airdrop test sessions. FY 2025 to FY 2026 Increase/Decrease Statement: The FY 2026 funding increase of \$0.432 million is a result of planned first full year project schedule and development. Transition to Product Manager, Force Sustainment Systems				
Title: Expeditionary Concrete Construction for Ports of Debarkation Description: Use indigenous materials for contingency construction while minimizing logistics required to enable the construction. Technical Partner Engineering Research and Development Command. FY 2025 Plans: Develop plan for the integration of components. FY 2026 Plans: Acquire representative reef, limestone, and volcanic coarse aggregates and fine aggregates (sea sand) of interest from the Pacific Basin for laboratory testing and characterization. These materials will be characterized to determine their properties and develop a mixture design matrix to evaluate the effects of each material type on the performance of the mixture. Testing of the soundness of the aggregate materials when subjected to weathering action will be measured. FY 2025 to FY 2026 Increase/Decrease Statement: Increase of \$0.500 million back to original annual budget due to revised FY 2025 development schedule. Transition to Joint Construction Management System.		0.000	0.500	1.000
Title: Global Reach Description: Tactical Situation, COP, mission planning, intelligence, communications resiliency, ship survivability capabilities. Technical Partner U.S. Navy Naval Service Warfare Center. FY 2025 Plans:		0.000	1.008	2.173

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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0604776F <i>I Deployment & Distribution Enterprise R&D</i>		
C. Accomplishments/Planned Programs (\$ in Millions) Create detailed designs and tools to provide tactical Situation, Common Operation Picture (COP), mission planning, intelligence, communications resiliency, ship survivability capabilities. FY 2026 Plans: Conduct design activities to include but not limited to staff, operator and crew interviews, site, information technology, and network surveys to better understand Military Sealift Command's (MSC) near, mid and long-term strategic and operational needs. Specific requirements identified will be documented through a customer Technical Interchange Meeting to design, develop, integrate minotaur reach & minotaur web services into day-to-day MSC afloat (and ashore) operations. FY 2025 to FY 2026 Increase/Decrease Statement: The FY 2026 funding increase of \$1.165 million is a result of the first full year of the project development plan. Transition to PMA-290 Maritime Patrol and Reconnaissance Aircraft (MPRA) Program - Special Missions, Minotaur Family of Services (MFoS).		FY 2024	FY 2025	FY 2026
Title: Scalable Autonomous Modular Propulsion Kits Description: Develop scalable modular propulsion kits with marine automation for installation on ocean/riverine commercial barges. Technical partner is U.S. Army Engineering Research and Development Center. FY 2025 Plans: Continue the development of autonomous control system used to convert manned vessels to autonomous unmanned capability. FY 2026 Plans: In FY 2026, PE 0604776F, (Deployment & Distribution Enterprise R&D), Project 630004, (Deployment and Distribution & Prototyping) efforts were transferred to PE 0604776F, (Deployment & Distribution Enterprise R&D), Project 640216, (Deployment and Distribution Innovation) to align with funding with component development and prototypes in a high fidelity and realistic operating environment. FY 2025 to FY 2026 Increase/Decrease Statement: The FY 2026 funding decrease of \$0.500 million is a result of the project transition from a simulated testing environment to an operational environment and BA 04 funding. Transition to Naval Facilities Engineering Command Expeditionary Programs Office (NEPO) Sealift program; Office of the Chief of Naval Operations, Expeditionary Warfare (OPNAV N95), Strategic Mobility and Combat Logistics (OPNAV N42); and Program Manager Watercraft.		0.000	0.500	0.000
Title: Enhanced Vision Navigation for Joint Precision Airdrop System Description: Funds contract support for Air Mobility Command to support the development of advanced technologies to improve airdrop, aerial refueling, patient evacuation and other global mission in support of the joint warfighter.		0.000	0.550	0.560

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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0604776F <i>I Deployment & Distribution Enterprise R&D</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
FY 2025 Plans: Develop projects progression to ensure costs, schedule, performance.				
FY 2026 Plans: Continue to monitor projects progression to ensure costs, schedule, performance.				
FY 2025 to FY 2026 Increase/Decrease Statement: Economic adjustment increase of \$0.010 million from FY 2025 to FY 2026. Transition is not applicable as this provides continued support to Air Mobility Command to execute research innovation.				
Title: AI-Powered Sensitive Data Masking Description: Focus on masking structured data, building an organizational knowledge base, and masking unstructured data in USTRANSCOM systems.		0.000	0.300	0.000
FY 2025 Plans: Complete the identification of a focused subset of operational data that is commonly shared across trusted partners.				
FY 2026 Plans: In FY 2026, PE 0604776F, (Deployment & Distribution Enterprise R&D), Project 630004, (Deployment and Distribution & Prototyping) efforts were transferred to PE 0604776F, (Deployment & Distribution Enterprise R&D), Project 640216, (Deployment and Distribution Innovation) to align with funding with component development and prototypes in a high fidelity and realistic operating environment. Transition to USTRANSCOM's Cloud Environment.				
FY 2025 to FY 2026 Increase/Decrease Statement: The FY 2026 funding decrease of \$0.300 million is a result of the project transition from a simulated testing environment to an operational environment and BA 04 funding.				
Title: Massachusetts Institute of Technology Lincoln Labs (MIT LL) 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. Algorithm and Artificial Intelligence (AI) innovations being spirally transitioned to numerous USTRANSCOM and Component systems/environments.		0.000	3.780	2.750
FY 2025 Plans:				

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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0604776F <i>I Deployment & Distribution Enterprise R&D</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
Multiple efforts to increase decision support in support of JDDE missions. Transition Strategy: Air Refueling Model & Analysis of Mobility Platform; Palantir Vantage data system, Theater Patient Movement Requirements Centers (TPMRCs), TRANSCOM Regulating and Command & Control Evacuation System, Palantir Envision data environment. FY 2026 Plans: Continue multiple efforts to increase decision support in support of JDDE missions. Transition Strategy: Air Refueling Model & Analysis of Mobility Platform; Palantir Vantage data system, Theater Patient Movement Requirements Centers (TPMRCs), TRANSCOM Regulating and Command & Control Evacuation System, Palantir Envision data environment. FY 2025 to FY 2026 Increase/Decrease Statement: MIT-LL working four separate lines of effort. The FY 2026 funding decrease of \$1.030 million is a result of the accelerated completion of one of those lines of effort in FY 2025. Spirally transition capabilities to improve the effectiveness and efficiency of USTRANSCOM systems/decision support.				
Title: Modeling & Simulation Innovation Description: Funds Air Force Institute of Technology (AFIT) 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). Focused on USTRANSCOM staff provided research needs that address Joint Deployment and Distribution Enterprise (JDDE) and Joint Petroleum Enterprise (JPE) challenges. FY 2025 Plans: Fund AFIT student research addressing transportation/distribution identified issues. FY 2026 Plans: Collaboration partnership with AFIT for student research on transportation/distribution identified issues. Students accomplish varying levels of graduate research through the completion of graduate research projects, theses, and dissertations. USTRANSCOM's deployment and distribution problems provide an excellent opportunity to accomplish worthwhile research at all levels. Student Research at Air Force Institute of Technology. FY 2025 to FY 2026 Increase/Decrease Statement: FY 2025 to FY 2026 increase of \$0.020 million due to economic adjustments.		0.000	0.115	0.135
Title: Program Execution		0.000	1.094	1.130

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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0604776F / <i>Deployment & Distribution Enterprise R&D</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
Description: Provide technical assistance and program management support to the USTRANSCOM RDT&E Program. Coordinate with Joint Deployment and Distribution Enterprise (JDDE) / Joint Petroleum Enterprise (JPE) partners on project execution, monitoring costs, scope, schedule, and performance. Fund Government travel in support of Program Management. FY 2025 Plans: 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 JDDE and JPE. Shaping innovation through participation in various technology forums, experimentation events, and project test/demonstrations. FY 2026 Plans: Continue 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, Force Design/ Development to increase the responsiveness, efficiency and effectiveness of the Joint Deployment and Distribution Enterprise. Support innovation through technology forums, experimentation events, and project tests/demonstrations. FY 2025 to FY 2026 Increase/Decrease Statement: The FY 2026 funding increase of \$0.036 million is a result of regular inflation increases. Transition not applicable as this provides contracted support for the USTRANSCOM Research, Development, Test & Evaluation (RDT&E) program execution.				
Title: JDDE Mission Assurance Coordinator Description: Develop a JDDE-wide method for mission coordination. Technical partner Air Force Research Lab. FY 2025 Plans: Continue iterations of conceive, build, and test solutions for enhanced integration of air, land, maritime, cyberspace and space domains information to provide national multiple risk-evaluated options. FY 2026 Plans: Continue developing risk-evaluated options and testing solutions for leaders for enhanced integration of air, land, maritime, cyberspace and space domains information. FY 2025 to FY 2026 Increase/Decrease Statement: The FY 2026 funding increase of \$0.764 million is a result of the first full year project development plan. Transition to USTRANSCOM Cloud One Environment.		0.000	0.846	1.610
Title: Cyber Mission Assurance Technologies		0.000	1.537	0.000

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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0604776F / <i>Deployment & Distribution Enterprise R&D</i>			
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2024	FY 2025	FY 2026
Description: Near real-time understanding of the operational impact of cyber risks, threats, and disruptions. Technical partners are Air Force Research Lab and USCYBERCOM. Operational leads are USINDOPACOM and Air Mobility Command. FY 2025 Plans: Continue to 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 2026 Plans: In FY 2026, PE 0604776F, (Deployment & Distribution Enterprise R&D), Project 630004, (Deployment and Distribution & Prototyping) efforts were transferred to PE 0604776F, (Deployment & Distribution Enterprise R&D), Project 640216, (Deployment and Distribution Innovation) to align with funding with component development and prototypes in a high fidelity and realistic operating environment. FY 2025 to FY 2026 Increase/Decrease Statement: The FY 2026 funding decrease of \$1.537 million is a result of project completion in FY 2025. Transition to JCC2 (Joint Cyber Command and Control) - United States Cyber Command (USCYBERCOM), CRMT (Cyber Risk Management Toolkit) - Office of the Undersecretary of Defense, Acquisition Sustainment (OUSD(A&S)).				
Accomplishments/Planned Programs Subtotals		0.000	19.441	28.316
D. Other Program Funding Summary (\$ in Millions) N/A				
Remarks				
E. 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.				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force										Date: June 2025		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
3600: Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)					PE 0207412F I Control and Reporting Center (CRC)							
COST (\$ in Millions)	Prior Years	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total	FY 2027	FY 2028	FY 2029	FY 2030	Cost To Complete	Total Cost
Total Program Element	0.000	0.000	2.012	0.000	0.000	0.000	-	-	-	-	-	-
635321: C4I Battlespace Dev & Demo	0.000	0.000	2.012	0.000	0.000	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Air Force does not have an enterprise solution for multi-domain battlespace awareness and command and control (C2) tools below the Air Operations Center (AOC) level. This presents significant challenges in obtaining a Common Operating Picture (COP) capable of disaggregation from the AOC, particularly at Anderson AFB, Guam which is the center hub in the Air Force's Agile Combat Employment (ACE) capability in the Pacific. Sharing a COP with the AOC is essential at peacetime for defense and at wartime for conducting operations, and the lack of a current solution further complicates the conduct of ACE operations.

Incorporating emerging technology into major operational exercises informs and refines Warfighter requirements and provides opportunities for early adoption and Tactics, Techniques, and Procedures (TTPs) development. Utilizing operationally relevant conditions also provides early opportunities for learning and materiel deficiency discovery. Efforts explore technology advancement to provide a common operating picture in support of Agile Combat Employment (ACE).

FY2025 funds will be used to develop and incorporate the latest commercial or government solutions into our operations to help identify best-of-breed technology, permit feedback to developers for improvements and refine operational tactics, techniques, and procedures (TTPs) for the conduct of ACE. Deployment will initially be in Guam to enable learning and assessment of tools under real operating conditions and crucially to create a sub-AOC COP at the heart of our ACE operations in the Pacific immediately. Funds will be used to support experimentation with and deployment of the sub-AOC capability including TTP delineation.

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2026 Air Force					Date: June 2025
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)			R-1 Program Element (Number/Name) PE 0207412F I Control and Reporting Center (CRC)		
B. Program Change Summary (\$ in Millions)	FY 2024	FY 2025	FY 2026 Base	FY 2026 OOC	FY 2026 Total
Previous President's Budget	2.005	2.012	0.000	0.000	0.000
Current President's Budget	0.000	2.012	0.000	0.000	0.000
Total Adjustments	-2.005	0.000	0.000	0.000	0.000
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	-2.005	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 2024 reduction for \$2.005 million due to unjustified request					
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2024	FY 2025
Title: C2/Battlespace Awareness Tools				0.000	2.012
Description: Integrating emerging technologies into major exercises					
FY 2025 Plans:					
-Identify, develop, integrate and field emerging technologies					
-Test tools to provide a common operating picture					
FY 2025 to FY 2026 Increase/Decrease Statement:					
No Funds requested in FY 2026					
Accomplishments/Planned Programs Subtotals				0.000	2.012
D. Other Program Funding Summary (\$ in Millions) N/A Remarks					
E. Acquisition Strategy N/A					