Department of Defense
Fiscal Year (FY) 2020 Budget Estimates

March 2019

Air Force

Justification Book Volume 3b of 3

Research, Development, Test & Evaluation, Air Force

Vol−III Part 2

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Department of Defense
FY 2020 President's Budget
Exhibit R-1 FY 2020 President's Budget
Total Obligational Authority
(Dollars in Thousands)

19 Feb 2019

Appropriation	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 Total Enacted
Research, Development, Test & Eval, AF	38,077,597	41,166,683	321,934	41,488,617
Total Research, Development, Test & Evaluation	38,077,597	41,166,683	321,934	41,488,617

Department of Defense
FY 2020 President's Budget
Exhibit R-1 FY 2020 President's Budget
Total Obligational Authority
(Dollars in Thousands)

19 Feb 2019

Appropriation	FY 2020 Base	FY 2020 OCO for Base Requirements	FY 2020 OCO for Direct War and Enduring Costs	FY 2020 Total OCO	FY 2020 Total (Base + OCO)
Research, Development, Test & Eval, AF	45,616,122	322,000	128,248	450,248	46,066,370
Total Research, Development, Test & Evaluation	45,616,122	322,000	128,248	450,248	46,066,370

R-120PB: FY 2020 President's Budget (Published Version), as of February 19, 2019 at 15:33:03

Department of Defense
FY 2020 President's Budget
Exhibit R-1 FY 2020 President's Budget
Total Obligational Authority
(Dollars in Thousands)

19 Feb 2019

Summary Recap of Budget Activities	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 Total Enacted
Basic Research	491,502	561,329		561,329
Applied Research	1,454,070	1,480,573		1,480,573
Advanced Technology Development	829,525	928,747		928,747
Advanced Component Development & Prototypes	4,962,068	6,625,697	13,495	6,639,192
System Development & Demonstration	4,407,341	5,453,523		5,453,523
Management Support	3,490,712	2,963,117		2,963,117
Operational Systems Development	22,442,379	23,153,697	308,439	23,462,136
Total Research, Development, Test & Evaluation	38,077,597	41,166,683	321,934	41,488,617
Summary Recap of FYDP Programs				
Strategic Forces	784,917	1,018,923	34,000	1,052,923
General Purpose Forces	2,899,628	3,077,252	53,049	3,130,301
Intelligence and Communications	1,609,415	1,438,024	54,600	1,492,624
Mobility Forces	550,926	898,833		898,833
Research and Development	11,665,345	12,799,979		12,799,979
Central Supply and Maintenance	97,493	96,826		96,826
Training Medical and Other	2,558	2,578		2,578
Administration and Associated Activities	118,914	122,255		122,255
Support of Other Nations	4,418	3,998		3,998

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Department of Defense
FY 2020 President's Budget
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19 Feb 2019

Summary Recap of Budget Activities	FY 2020 Base	FY 2020 OCO for Base Requirements	FY 2020 OCO for Direct War and Enduring Costs	FY 2020 Total OCO	FY 2020 Total (Base + OCO)
Basic Research	529,761				529,761
Applied Research	1,435,626				1,435,626
Advanced Technology Development	839,153				839,153
Advanced Component Development & Prototypes	8,436,279		44,335	44,335	8,480,614
System Development & Demonstration	6,929,244				6,929,244
Management Support	2,916,571				2,916,571
Operational Systems Development	24,529,488	322,000	83,913	405,913	24,935,401
Total Research, Development, Test & Evaluation	45,616,122	322,000	128,248	450,248	46,066,370
Summary Recap of FYDP Programs					
Strategic Forces	879,977				879,977
General Purpose Forces	3,488,992		5,200	5,200	3,494,192
Intelligence and Communications	1,393,298				1,393,298
Mobility Forces	979,221				979,221
Research and Development	14,419,778		26,450	26,450	14,446,228
Central Supply and Maintenance	37,505				37,505
Training Medical and Other	3,542				3,542
Administration and Associated Activities	90,730				90,730
Support of Other Nations	4,071				4,071

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Department of Defense
FY 2020 President's Budget
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Total Obligational Authority
(Dollars in Thousands)

19 Feb 2019

	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 Total Enacted
Space	3,554,350	4,848,491	18,495	4,866,986
Classified Programs	16,789,633	16,859,524	161,790	17,021,314
Total Research, Development, Test & Evaluation	38,077,597	41,166,683	321,934	41,488,617

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FY 2020 President's Budget
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(Dollars in Thousands)

19 Feb 2019

	FY 2020 Base	FY 2020 OCO for Base Requirements	FY 2020 OCO for Direct War and Enduring Costs	FY 2020 Total OCO	FY 2020 Total (Base + OCO)
Space	6,289,502		17,885	17,885	6,307,387
Classified Programs	18,029,506	322,000	78,713	400,713	18,430,219
Total Research, Development, Test & Evaluation	45,616,122	322,000	128,248	450,248	46,066,370

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Department of the Air Force
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Summary Recap of Budget Activities	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 Total Enacted
Basic Research	491,502	561,329		561,329
Applied Research	1,454,070	1,480,573		1,480,573
Advanced Technology Development	829,525	928,747		928,747
Advanced Component Development & Prototypes	4,962,068	6,625,697	13,495	6,639,192
System Development & Demonstration	4,407,341	5,453,523		5,453,523
Management Support	3,490,712	2,963,117		2,963,117
Operational Systems Development	22,442,379	23,153,697	308,439	23,462,136
Total Research, Development, Test & Evaluation	38,077,597	41,166,683	321,934	41,488,617
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Strategic Forces	784,917	1,018,923	34,000	1,052,923
General Purpose Forces	2,899,628	3,077,252	53,049	3,130,301
Intelligence and Communications	1,609,415	1,438,024	54,600	1,492,624
Mobility Forces	550,926	898,833		898,833
Research and Development	11,665,345	12,799,979		12,799,979
Central Supply and Maintenance	97,493	96,826		96,826
Training Medical and Other	2,558	2,578		2,578
Administration and Associated Activities	118,914	122,255		122,255
Support of Other Nations	4,418	3,998		3,998

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Applied Research	1,435,626				1,435,626
Advanced Technology Development	839,153				839,153
Advanced Component Development & Prototypes	8,436,279		44,335	44,335	8,480,614
System Development & Demonstration	6,929,244				6,929,244
Management Support	2,916,571				2,916,571
Operational Systems Development	24,529,488	322,000	83,913	405,913	24,935,401
Total Research, Development, Test & Evaluation	45,616,122	322,000	128,248	450,248	46,066,370
Summary Recap of FYDP Programs					
Strategic Forces	879,977				879,977
General Purpose Forces	3,488,992		5,200	5,200	3,494,192
Intelligence and Communications	1,393,298				1,393,298
Mobility Forces	979,221				979,221
Research and Development	14,419,778		26,450	26,450	14,446,228
Central Supply and Maintenance	37,505				37,505
Training Medical and Other	3,542				3,542
Administration and Associated Activities	90,730				90,730
Support of Other Nations	4,071				4,071

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19 Feb 2019

Summary Recap of Budget Activities	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 Total Enacted
Space	3,554,350	4,848,491	18,495	4,866,986
Classified Programs	16,789,633	16,859,524	161,790	17,021,314
Total Research, Development, Test & Evaluation	38,077,597	41,166,683	321,934	41,488,617

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Space	6,289,502		17,885	17,885	6,307,387
Classified Programs	18,029,506	322,000	78,713	400,713	18,430,219
Total Research, Development, Test & Evaluation	45,616,122	322,000	128,248	450,248	46,066,370

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19 Feb 2019

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

Line No	Program Element Number	Item	Act	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 Total Enacted	Sec
1	0601102F	Defense Research Sciences	01	320,961	383,322		383,322	U
2	0601103F	University Research Initiatives	01	157,079	164,991		164,991	U
3	0601108F	High Energy Laser Research Initiatives	01	13,462	13,016		13,016	U
	Basic Research			491,502	561,329		561,329	
4	0602102F	Materials	02	143,900	181,373		181,373	U
5	0602201F	Aerospace Vehicle Technologies	02	151,637	160,461		160,461	U
6	0602202F	Human Effectiveness Applied Research	02	126,542	119,018		119,018	U
7	0602203F	Aerospace Propulsion	02	192,846	218,419		218,419	U
8	0602204F	Aerospace Sensors	02	157,078	171,307		171,307	U
9	0602212F	Defense Laboratories R&D Projects (10 U.S.C, Sec 2358)	02	74,760				U
10	0602298F	Science and Technology Management - Major Headquarters Activities	02	8,353	8,288		8,288	U
11	0602601F	Space Technology	02	145,921				U
12	0602602F	Conventional Munitions	02	99,543	112,841		112,841	U
13	0602605F	Directed Energy Technology	02	121,610	141,800		141,800	U
14	0602788F	Dominant Information Sciences and Methods	02	191,724	185,276		185,276	U
15	0602890F	High Energy Laser Research	02	40,156	43,192		43,192	U
16	1206601F	Space Technology	02		138,598		138,598	U
	Applied Research			1,454,070	1,480,573		1,480,573	

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

Line No	Program Element Number	Item	Act	FY 2020 Base	FY 2020 OCO for Base Requirements	FY 2020 OCO for Direct War and Enduring Costs	FY 2020 Total OCO	FY 2020 Total (Base + OCO)	Sec
1	0601102F	Defense Research Sciences	01	356,107				356,107	U
2	0601103F	University Research Initiatives	01	158,859				158,859	U
3	0601108F	High Energy Laser Research Initiatives	01	14,795				14,795	U
	Basic Research			529,761				529,761	
4	0602102F	Materials	02	128,851				128,851	U
5	0602201F	Aerospace Vehicle Technologies	02	147,724				147,724	U
6	0602202F	Human Effectiveness Applied Research	02	131,795				131,795	U
7	0602203F	Aerospace Propulsion	02	198,775				198,775	U
8	0602204F	Aerospace Sensors	02	202,912				202,912	U
9	0602212F	Defense Laboratories R&D Projects (10 U.S.C, Sec 2358)	02						U
10	0602298F	Science and Technology Management - Major Headquarters Activities	02	7,968				7,968	U
11	0602601F	Space Technology	02						U
12	0602602F	Conventional Munitions	02	142,772				142,772	U
13	0602605F	Directed Energy Technology	02	124,379				124,379	U
14	0602788F	Dominant Information Sciences and Methods	02	181,562				181,562	U
15	0602890F	High Energy Laser Research	02	44,221				44,221	U
16	1206601F	Space Technology	02	124,667				124,667	U
	Applied Research			1,435,626				1,435,626	

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Line No	Program Element Number	Item	Act	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 Total Enacted	Sec
17	0603112F	Advanced Materials for Weapon Systems	03	34,694	47,426		47,426	U
18	0603199F	Sustainment Science and Technology (S&T)	03	20,724	15,150		15,150	U
19	0603203F	Advanced Aerospace Sensors	03	46,784	44,968		44,968	U
20	0603211F	Aerospace Technology Dev/Demo	03	103,123	126,002		126,002	U
21	0603216F	Aerospace Propulsion and Power Technology	03	122,217	148,418		148,418	U
22	0603270F	Electronic Combat Technology	03	56,238	55,054		55,054	U
23	0603401F	Advanced Spacecraft Technology	03	94,946	70,734		70,734	U
24	0603444F	Maui Space Surveillance System (MSSS)	03	9,755	10,674		10,674	U
25	0603456F	Human Effectiveness Advanced Technology Development	03	30,153	36,420		36,420	U
26	0603601F	Conventional Weapons Technology	03	157,676	204,756		204,756	U
27	0603605F	Advanced Weapons Technology	03	42,322	43,368		43,368	U
28	0603680F	Manufacturing Technology Program	03	63,224	65,760		65,760	U
29	0603788F	Battlespace Knowledge Development and Demonstration	03	45,481	60,017		60,017	U
30	0303467F	SENSR Spectrum Pipeline SRF	03	2,188				U
		Advanced Technology Development		829,525	928,747		928,747	
31	0603260F	Intelligence Advanced Development	04	7,652	5,568		5,568	U
32	0603742F	Combat Identification Technology	04	23,578	18,194		18,194	U

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Line No	Program Element Number	Item	Act	FY 2020 Base	FY 2020 OCO for Base Requirements	FY 2020 OCO for Direct War and Enduring Costs	FY 2020 Total OCO	FY 2020 Total (Base + OCO)	Sec
17	0603112F	Advanced Materials for Weapon Systems	03	36,586				36,586	U
18	0603199F	Sustainment Science and Technology (S&T)	03	16,249				16,249	U
19	0603203F	Advanced Aerospace Sensors	03	38,292				38,292	U
20	0603211F	Aerospace Technology Dev/Demo	03	102,949				102,949	U
21	0603216F	Aerospace Propulsion and Power Technology	03	113,973				113,973	U
22	0603270F	Electronic Combat Technology	03	48,408				48,408	U
23	0603401F	Advanced Spacecraft Technology	03	70,525				70,525	U
24	0603444F	Maui Space Surveillance System (MSSS)	03	11,878				11,878	U
25	0603456F	Human Effectiveness Advanced Technology Development	03	37,542				37,542	U
26	0603601F	Conventional Weapons Technology	03	225,817				225,817	U
27	0603605F	Advanced Weapons Technology	03	37,404				37,404	U
28	0603680F	Manufacturing Technology Program	03	43,116				43,116	U
29	0603788F	Battlespace Knowledge Development and Demonstration	03	56,414				56,414	U
30	0303467F	SENSR Spectrum Pipeline SRF	03						U
		Advanced Technology Development		839,153				839,153	
31	0603260F	Intelligence Advanced Development	04	5,672				5,672	U
32	0603742F	Combat Identification Technology	04	27,085				27,085	U

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

Line No	Program Element Number	Item	Act	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 Total Enacted	Sec
33	0603790F	NATO Research and Development	04	3,710	2,305		2,305	U
34	0603851F	Intercontinental Ballistic Missile - Dem/Val	04	27,424	32,356		32,356	U
35	0603859F	Pollution Prevention - Dem/Val	04	2	200		200	U
36	0604002F	Air Force Weather Services Research	04					U
37	0604004F	Advanced Engine Development	04		720,355		720,355	U
38	0604015F	Long Range Strike - Bomber	04	1,914,611	2,279,196		2,279,196	U
39	0604032F	Directed Energy Prototyping	04		50,000		50,000	U
40	0604033F	Hypersonics Prototyping	04		508,858		508,858	U
41	0604201F	PNT Resiliency, Mods, and Improvements	04	63,302	81,271		81,271	U
42	0604257F	Advanced Technology and Sensors	04	78,122	34,585		34,585	U
43	0604288F	National Airborne Ops Center (NAOC) Recap	04	6,141	7,440		7,440	U
44	0604317F	Technology Transfer	04	17,644	16,924		16,924	U
45	0604327F	Hard and Deeply Buried Target Defeat System (HDBTDS) Program	04	39,682	36,701		36,701	U
46	0604414F	Cyber Resiliency of Weapon Systems-ACS	04	41,055	62,618		62,618	U
47	0604776F	Deployment & Distribution Enterprise R&D	04	25,597	27,964		27,964	U
48	0604858F	Tech Transition Program	04	1,079,458	167,277		167,277	U
49	0605230F	Ground Based Strategic Deterrent	04	221,536	414,441		414,441	U

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33	0603790F	NATO Research and Development	04	4,955				4,955	U
34	0603851F	Intercontinental Ballistic Missile - Dem/Val	04	44,109				44,109	U
35	0603859F	Pollution Prevention - Dem/Val	04						U
36	0604002F	Air Force Weather Services Research	04	772				772	U
37	0604004F	Advanced Engine Development	04	878,442				878,442	U
38	0604015F	Long Range Strike - Bomber	04	3,003,899				3,003,899	U
39	0604032F	Directed Energy Prototyping	04	10,000				10,000	U
40	0604033F	Hypersonics Prototyping	04	576,000				576,000	U
41	0604201F	PNT Resiliency, Mods, and Improvements	04	92,600				92,600	U
42	0604257F	Advanced Technology and Sensors	04	23,145				23,145	U
43	0604288F	National Airborne Ops Center (NAOC) Recap	04	16,669				16,669	U
44	0604317F	Technology Transfer	04	23,614				23,614	U
45	0604327F	Hard and Deeply Buried Target Defeat System (HDBTDS) Program	04	113,121				113,121	U
46	0604414F	Cyber Resiliency of Weapon Systems-ACS	04	56,325				56,325	U
47	0604776F	Deployment & Distribution Enterprise R&D	04	28,034				28,034	U
48	0604858F	Tech Transition Program	04	128,476		26,450	26,450	154,926	U
49	0605230F	Ground Based Strategic Deterrent	04	570,373				570,373	U

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Line No	Program Element Number	Item	Act	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 Total Enacted	Sec
50	0207100F	Light Attack Armed Reconnaissance (LAAR) Squadrons	04					U
51	0207110F	Next Generation Air Dominance	04	283,964	429,610		429,610	U
52	0207455F	Three Dimensional Long-Range Radar (3DELRR)	04	12,122	24,856		24,856	U
53	0208099F	Unified Platform (UP)	04		29,800		29,800	U
54	0305236F	Common Data Link Executive Agent (CDL EA)	04	40,838	41,880		41,880	U
55	0305251F	Cyberspace Operations Forces and Force Support	04					U
56	0305601F	Mission Partner Environments	04		10,074		10,074	U
57	0306250F	Cyber Operations Technology Development	04	278,521	246,502		246,502	U
58	0306415F	Enabled Cyber Activities	04	16,687	16,325		16,325	U
59	0408011F	Special Tactics / Combat Control	04	4,266				U
60	0901410F	Contracting Information Technology System	04	18,973	17,577		17,577	U
61	1203164F	NAVSTAR Global Positioning System (User Equipment) (SPACE)	04	321,186	252,834		252,834	U
62	1203710F	EO/IR Weather Systems	04	8,000	7,940		7,940	U
63	1206422F	Weather System Follow-on	04	98,396	138,052		138,052	U
64	1206425F	Space Situation Awareness Systems	04	43,290	33,469		33,469	U
65	1206427F	Space Systems Prototype Transitions (SSPT)	04					U

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Line No	Program Element Number	Item	Act	FY 2020 Base	FY 2020 OCO for Base Requirements	FY 2020 OCO for Direct War and Enduring Costs	FY 2020 Total OCO	FY 2020 Total (Base + OCO)	Sec
50	0207100F	Light Attack Armed Reconnaissance (LAAR) Squadrons	04	35,000				35,000	U
51	0207110F	Next Generation Air Dominance	04	1,000,000				1,000,000	U
52	0207455F	Three Dimensional Long-Range Radar (3DELRR)	04	37,290				37,290	U
53	0208099F	Unified Platform (UP)	04	10,000				10,000	U
54	0305236F	Common Data Link Executive Agent (CDL EA)	04	36,910				36,910	U
55	0305251F	Cyberspace Operations Forces and Force Support	04	35,000				35,000	U
56	0305601F	Mission Partner Environments	04	8,550				8,550	U
57	0306250F	Cyber Operations Technology Development	04	198,864				198,864	U
58	0306415F	Enabled Cyber Activities	04	16,632				16,632	U
59	0408011F	Special Tactics / Combat Control	04						U
60	0901410F	Contracting Information Technology System	04	20,830				20,830	U
61	1203164F	NAVSTAR Global Positioning System (User Equipment) (SPACE)	04	329,948				329,948	U
62	1203710F	EO/IR Weather Systems	04	101,222				101,222	U
63	1206422F	Weather System Follow-on	04	225,660				225,660	U
64	1206425F	Space Situation Awareness Systems	04	29,776				29,776	U
65	1206427F	Space Systems Prototype Transitions (SSPT)	04	142,045				142,045	U

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Line No	Program Element Number	Item	Act	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 Total Enacted	Sec
66	1206434F	Midterm Polar MILSATCOM System	04	60,123	383,113		383,113	U
67	1206438F	Space Control Technology	04	44,139	90,546	1,100	91,646	U
68	1206730F	Space Security and Defense Program	04	41,385	45,542		45,542	U
69	1206760F	Protected Tactical Enterprise Service (PTES)	04	17,552	46,419		46,419	U
70	1206761F	Protected Tactical Service (PTS)	04	23,404	29,626		29,626	U
71	1206855F	Evolved Strategic SATCOM (ESS)	04	15,473	29,229		29,229	U
72	1206857F	Space Rapid Capabilities Office	04	84,235	286,050	12,395	298,445	U
		Advanced Component Development & Prototypes		4,962,068	6,625,697	13,495	6,639,192	
73	0604200F	Future Advanced Weapon Analysis & Programs	05	5,108	39,602		39,602	U
74	0604201F	PNT Resiliency, Mods, and Improvements	05	97,943	46,731		46,731	U
75	0604222F	Nuclear Weapons Support	05	2,910	4,468		4,468	U
76	0604270F	Electronic Warfare Development	05	2,159	1,909		1,909	U
77	0604281F	Tactical Data Networks Enterprise	05	42,128	270,015		270,015	U
78	0604287F	Physical Security Equipment	05	39,639	14,421		14,421	U
79	0604329F	Small Diameter Bomb (SDB) - EMD	05	37,667	78,091		78,091	U
80	0604429F	Airborne Electronic Attack	05	4,910	6,153		6,153	U
81	0604602F	Armament/Ordnance Development	05	16,765	49,590		49,590	U
82	0604604F	Submunitions	05	2,697	2,990		2,990	U
83	0604617F	Agile Combat Support	05	36,351	23,489		23,489	U

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66	1206434F	Midterm Polar MILSATCOM System	04						U
67	1206438F	Space Control Technology	04	64,231				64,231	U
68	1206730F	Space Security and Defense Program	04	56,385				56,385	U
69	1206760F	Protected Tactical Enterprise Service (PTES)	04	105,003				105,003	U
70	1206761F	Protected Tactical Service (PTS)	04	173,694				173,694	U
71	1206855F	Evolved Strategic SATCOM (ESS)	04	172,206				172,206	U
72	1206857F	Space Rapid Capabilities Office	04	33,742		17,885	17,885	51,627	U
		Advanced Component Development & Prototypes		8,436,279		44,335	44,335	8,480,614	
73	0604200F	Future Advanced Weapon Analysis & Programs	05	246,200				246,200	U
74	0604201F	PNT Resiliency, Mods, and Improvements	05	67,782				67,782	U
75	0604222F	Nuclear Weapons Support	05	4,406				4,406	U
76	0604270F	Electronic Warfare Development	05	2,066				2,066	U
77	0604281F	Tactical Data Networks Enterprise	05	229,631				229,631	U
78	0604287F	Physical Security Equipment	05	9,700				9,700	U
79	0604329F	Small Diameter Bomb (SDB) - EMD	05	31,241				31,241	U
80	0604429F	Airborne Electronic Attack	05	2				2	U
81	0604602F	Armament/Ordnance Development	05	28,043				28,043	U
82	0604604F	Submunitions	05	3,045				3,045	U
83	0604617F	Agile Combat Support	05	19,944				19,944	U

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84	0604706F	Life Support Systems	05	10,342	8,919		8,919	U
85	0604735F	Combat Training Ranges	05	75,981	43,895		43,895	U
86	0604800F	F-35 - EMD	05	282,126	69,001		69,001	U
87	0604932F	Long Range Standoff Weapon	05	437,521	664,920		664,920	U
88	0604933F	ICBM Fuze Modernization	05	166,571	167,659		167,659	U
89	0605030F	Joint Tactical Network Center (JTNC)	05	404				U
90	0605031F	Joint Tactical Network (JTN)	05	1,331				U
91	0605056F	Open Architecture Management	05					U
92	0605213F	F-22 Modernization Increment 3.2B	05	10,482				U
93	0605221F	KC-46	05	75,598	80,170		80,170	U
94	0605223F	Advanced Pilot Training	05	82,628	245,465		245,465	U
95	0605229F	Combat Rescue Helicopter	05	342,030	445,652		445,652	U
96	0605458F	Air & Space Ops Center 10.2 RDT&E	05	4,666				U
97	0605830F	Acq Workforce- Global Battle Mgmt	05		3,617		3,617	U
98	0605931F	B-2 Defensive Management System	05	148,946	253,258		253,258	U
99	0101125F	Nuclear Weapons Modernization	05	81,631	81,592		81,592	U
100	0101213F	Minuteman Squadrons	05					U
101	0207171F	F-15 EPAWSS	05	202,167	137,095		137,095	U
102	0207328F	Stand In Attack Weapon	05	3,288	14,975		14,975	U
103	0207701F	Full Combat Mission Training	05	8,427	1,015		1,015	U

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84	0604706F	Life Support Systems	05	8,624				8,624	U
85	0604735F	Combat Training Ranges	05	37,365				37,365	U
86	0604800F	F-35 - EMD	05	7,628				7,628	U
87	0604932F	Long Range Standoff Weapon	05	712,539				712,539	U
88	0604933F	ICBM Fuze Modernization	05	161,199				161,199	U
89	0605030F	Joint Tactical Network Center (JTNC)	05	2,414				2,414	U
90	0605031F	Joint Tactical Network (JTN)	05						U
91	0605056F	Open Architecture Management	05	30,000				30,000	U
92	0605213F	F-22 Modernization Increment 3.2B	05						U
93	0605221F	KC-46	05	59,561				59,561	U
94	0605223F	Advanced Pilot Training	05	348,473				348,473	U
95	0605229F	Combat Rescue Helicopter	05	247,047				247,047	U
96	0605458F	Air & Space Ops Center 10.2 RDT&E	05						U
97	0605830F	Acq Workforce- Global Battle Mgmt	05						U
98	0605931F	B-2 Defensive Management System	05	294,400				294,400	U
99	0101125F	Nuclear Weapons Modernization	05	27,564				27,564	U
100	0101213F	Minuteman Squadrons	05	1				1	U
101	0207171F	F-15 EPAWSS	05	47,322				47,322	U
102	0207328F	Stand In Attack Weapon	05	162,840				162,840	U
103	0207701F	Full Combat Mission Training	05	9,797				9,797	U

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104	0303267F	Auctioned Spectrum Relocation Fund	05	60,546				U
105	0307581F	JSTARS Recap	05	390,713				U
106	0401310F	C-32 Executive Transport Recapitalization	05	2,918	7,943		7,943	U
107	0401319F	VC-25B	05	418,500	657,932		657,932	U
108	0701212F	Automated Test Systems	05	17,850	13,653		13,653	U
109	1203176F	Combat Survivor Evader Locator	05	24,099	939		939	U
110	1203269F	GPS III Follow-On (GPS IIIF)	05		426,889		426,889	U
111	1203940F	Space Situation Awareness Operations	05	9,684	46,015		46,015	U
112	1206421F	Counterspace Systems	05	64,208	20,242		20,242	U
113	1206422F	Weather System Follow-on	05					U
114	1206425F	Space Situation Awareness Systems	05	47,580	134,464		134,464	U
115	1206426F	Space Fence	05	34,022	19,425		19,425	U
116	1206431F	Advanced EHF MILSATCOM (SPACE)	05	134,775	144,753		144,753	U
117	1206432F	Polar MILSATCOM (SPACE)	05	32,536	26,380		26,380	U
118	1206433F	Wideband Global SATCOM (SPACE)	05	6,535	3,970		3,970	U
119	1206441F	Space Based Infrared System (SBIRS) High EMD	05	119,585	60,565		60,565	U
120	1206442F	Next Generation OPIR	05	439,497	643,126		643,126	U
121	1206445F	Commercial SATCOM (COMSATCOM) Integration	05		49,500		49,500	U

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104	0303267F	Auctioned Spectrum Relocation Fund	05						U
105	0307581F	JSTARS Recap	05						U
106	0401310F	C-32 Executive Transport Recapitalization	05	9,930				9,930	U
107	0401319F	VC-25B	05	757,923				757,923	U
108	0701212F	Automated Test Systems	05	2,787				2,787	U
109	1203176F	Combat Survivor Evader Locator	05	2,000				2,000	U
110	1203269F	GPS III Follow-On (GPS IIIF)	05	462,875				462,875	U
111	1203940F	Space Situation Awareness Operations	05	76,829				76,829	U
112	1206421F	Counterspace Systems	05	29,037				29,037	U
113	1206422F	Weather System Follow-on	05	2,237				2,237	U
114	1206425F	Space Situation Awareness Systems	05	412,894				412,894	U
115	1206426F	Space Fence	05						U
116	1206431F	Advanced EHF MILSATCOM (SPACE)	05	117,290				117,290	U
117	1206432F	Polar MILSATCOM (SPACE)	05	427,400				427,400	U
118	1206433F	Wideband Global SATCOM (SPACE)	05	1,920				1,920	U
119	1206441F	Space Based Infrared System (SBIRS) High EMD	05	1				1	U
120	1206442F	Next Generation OPIR	05	1,395,278				1,395,278	U
121	1206445F	Commercial SATCOM (COMSATCOM) Integration	05						U

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122	1206853F	National Security Space Launch Program (SPACE) - EMD	05	381,877	443,035		443,035	U
		System Development & Demonstration		4,407,341	5,453,523		5,453,523	
123	0604256F	Threat Simulator Development	06	34,777	34,206		34,206	U
124	0604759F	Major T&E Investment	06	111,138	216,844		216,844	U
125	0605101F	RAND Project Air Force	06	33,089	34,614		34,614	U
126	0605502F	Small Business Innovation Research	06	663,657				U
127	0605712F	Initial Operational Test & Evaluation	06	15,523	18,043		18,043	U
128	0605807F	Test and Evaluation Support	06	735,688	692,784		692,784	U
129	0605826F	Acq Workforce- Global Power	06	216,144	227,824		227,824	U
130	0605827F	Acq Workforce- Global Vig & Combat Sys	06	225,854	256,617		256,617	U
131	0605828F	Acq Workforce- Global Reach	06	138,491	149,586		149,586	U
132	0605829F	Acq Workforce- Cyber, Network, & Bus Sys	06	205,643	226,257		226,257	U
133	0605830F	Acq Workforce- Global Battle Mgmt	06	146,852	165,438		165,438	U
134	0605831F	Acq Workforce- Capability Integration	06	221,676	220,320		220,320	U
135	0605832F	Acq Workforce- Advanced Prgm Technology	06	27,997	37,399		37,399	U
136	0605833F	Acq Workforce- Nuclear Systems	06	124,111	122,481		122,481	U
137	0605898F	Management HQ - R&D	06	9,394	10,364		10,364	U

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122	1206853F	National Security Space Launch Program (SPACE) - EMD	05	432,009				432,009	U
		System Development & Demonstration		6,929,244				6,929,244	
123	0604256F	Threat Simulator Development	06	59,693				59,693	U
124	0604759F	Major T&E Investment	06	181,663				181,663	U
125	0605101F	RAND Project Air Force	06	35,258				35,258	U
126	0605502F	Small Business Innovation Research	06						U
127	0605712F	Initial Operational Test & Evaluation	06	13,793				13,793	U
128	0605807F	Test and Evaluation Support	06	717,895				717,895	U
129	0605826F	Acq Workforce- Global Power	06	258,667				258,667	U
130	0605827F	Acq Workforce- Global Vig & Combat Sys	06	251,992				251,992	U
131	0605828F	Acq Workforce- Global Reach	06	149,191				149,191	U
132	0605829F	Acq Workforce- Cyber, Network, & Bus Sys	06	235,360				235,360	U
133	0605830F	Acq Workforce- Global Battle Mgmt	06	160,196				160,196	U
134	0605831F	Acq Workforce- Capability Integration	06	220,255				220,255	U
135	0605832F	Acq Workforce- Advanced Prgm Technology	06	42,392				42,392	U
136	0605833F	Acq Workforce- Nuclear Systems	06	133,231				133,231	U
137	0605898F	Management HQ - R&D	06	5,590				5,590	U

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138	0605976F	Facilities Restoration and Modernization - Test and Evaluation Support	06	135,507	187,216		187,216	U
139	0605978F	Facilities Sustainment - Test and Evaluation Support	06	28,720	28,888		28,888	U
140	0606017F	Requirements Analysis and Maturation	06	106,646	48,070		48,070	U
141	0606398F	Management HQ - T&E	06					U
142	0308602F	ENTEPRISE INFORMATION SERVICES (EIS)	06	18,980	20,435		20,435	U
143	0702806F	Acquisition and Management Support	06	14,706	12,367		12,367	U
144	0804731F	General Skill Training	06	457	448		448	U
145	0909999F	Financing for Cancelled Account Adjustments	06	391				U
146	1001004F	International Activities	06	4,418	3,998		3,998	U
147	1206116F	Space Test and Training Range Development	06	24,886	23,157		23,157	U
148	1206392F	Space and Missile Center (SMC) Civilian Workforce	06	175,247	169,912		169,912	U
149	1206398F	Space & Missile Systems Center - MHA	06	8,681	10,508		10,508	U
150	1206860F	Rocket Systems Launch Program (SPACE)	06	33,023	19,721		19,721	U
151	1206864F	Space Test Program (STP)	06	29,016	25,620		25,620	U
		Management Support		3,490,712	2,963,117		2,963,117	
152	0604003F	Advanced Battle Management System (ABMS)	07		27,883		27,883	U

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138	0605976F	Facilities Restoration and Modernization - Test and Evaluation Support	06	88,445				88,445	U
139	0605978F	Facilities Sustainment - Test and Evaluation Support	06	29,424				29,424	U
140	0606017F	Requirements Analysis and Maturation	06	62,715				62,715	U
141	0606398F	Management HQ - T&E	06	5,013				5,013	U
142	0308602F	ENTEPRISE INFORMATION SERVICES (EIS)	06	17,128				17,128	U
143	0702806F	Acquisition and Management Support	06	5,913				5,913	U
144	0804731F	General Skill Training	06	1,475				1,475	U
145	0909999F	Financing for Cancelled Account Adjustments	06						U
146	1001004F	International Activities	06	4,071				4,071	U
147	1206116F	Space Test and Training Range Development	06	19,942				19,942	U
148	1206392F	Space and Missile Center (SMC) Civilian Workforce	06	167,810				167,810	U
149	1206398F	Space & Missile Systems Center - MHA	06	10,170				10,170	U
150	1206860F	Rocket Systems Launch Program (SPACE)	06	13,192				13,192	U
151	1206864F	Space Test Program (STP)	06	26,097				26,097	U
		Management Support		2,916,571				2,916,571	
152	0604003F	Advanced Battle Management System (ABMS)	07	35,611				35,611	U

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153	0604222F	Nuclear Weapons Support	07	26,672				U
154	0604233F	Specialized Undergraduate Flight Training	07	6,269	11,344		11,344	U
155	0604445F	Wide Area Surveillance	07	37,750				U
156	0604776F	Deployment & Distribution Enterprise R&D	07					U
157	0604840F	F-35 C2D2	07					U
158	0605018F	AF Integrated Personnel and Pay System (AF-IPPS)	07	17,298	41,058		41,058	U
159	0605024F	Anti-Tamper Technology Executive Agency	07	37,304	32,770		32,770	U
160	0605117F	Foreign Materiel Acquisition and Exploitation	07	66,653	68,368		68,368	U
161	0605278F	HC/MC-130 Recap RDT&E	07	30,784	16,174		16,174	U
162	0606018F	NC3 Integration	07	12,382	19,312		19,312	U
163	0606942F	Assessments and Evaluations Cyber Vulnerabilities	07		87,800		87,800	U
164	0101113F	B-52 Squadrons	07	107,936	291,264	34,000	325,264	U
165	0101122F	Air-Launched Cruise Missile (ALCM)	07	446	5,955		5,955	U
166	0101126F	B-1B Squadrons	07	60,367	60,295		60,295	U
167	0101127F	B-2 Squadrons	07	89,781	105,508		105,508	U
168	0101213F	Minuteman Squadrons	07	204,208	154,733		154,733	U

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153	0604222F	Nuclear Weapons Support	07						U
154	0604233F	Specialized Undergraduate Flight Training	07	2,584				2,584	U
155	0604445F	Wide Area Surveillance	07						U
156	0604776F	Deployment & Distribution Enterprise R&D	07	903				903	U
157	0604840F	F-35 C2D2	07	694,455				694,455	U
158	0605018F	AF Integrated Personnel and Pay System (AF-IPPS)	07	40,567				40,567	U
159	0605024F	Anti-Tamper Technology Executive Agency	07	47,193				47,193	U
160	0605117F	Foreign Materiel Acquisition and Exploitation	07	70,083				70,083	U
161	0605278F	HC/MC-130 Recap RDT&E	07	17,218				17,218	U
162	0606018F	NC3 Integration	07	25,917				25,917	U
163	0606942F	Assessments and Evaluations Cyber Vulnerabilities	07						U
164	0101113F	B-52 Squadrons	07	325,974				325,974	U
165	0101122F	Air-Launched Cruise Missile (ALCM)	07	10,217				10,217	U
166	0101126F	B-1B Squadrons	07	1,000				1,000	U
167	0101127F	B-2 Squadrons	07	97,276				97,276	U
168	0101213F	Minuteman Squadrons	07	128,961				128,961	U

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Line No	Program Element Number	Item	Act	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 Total Enacted	Sec
169	0101313F	Integrated Strategic Planning and Analysis Network (ISPAN) - USSTRATCOM	07	24,898				U
170	0101316F	Worldwide Joint Strategic Communications	07	12,868	18,442		18,442	U
171	0101324F	Integrated Strategic Planning & Analysis Network	07	10,757	22,833		22,833	U
172	0101328F	ICBM Reentry Vehicles	07		14,167		14,167	U
174	0102110F	UH-1N Replacement Program	07	188,259	258,022		258,022	U
175	0102326F	Region/Sector Operation Control Center Modernization Program	07	3,766	6,112		6,112	U
176	0205219F	MQ-9 UAV	07	184,353	104,345	4,500	108,845	U
177	0205671F	Joint Counter RCIED Electronic Warfare	07			4,000	4,000	U
178	0207131F	A-10 Squadrons	07	17,459	26,738	1,000	27,738	U
179	0207133F	F-16 Squadrons	07	250,264	185,864		185,864	U
180	0207134F	F-15E Squadrons	07	308,218	203,183		203,183	U
181	0207136F	Manned Destructive Suppression	07	11,735	15,238		15,238	U
182	0207138F	F-22A Squadrons	07	584,004	584,743		584,743	U
183	0207142F	F-35 Squadrons	07	325,224	503,928		503,928	U
184	0207161F	Tactical AIM Missiles	07	36,303	37,230		37,230	U
185	0207163F	Advanced Medium Range Air-to-Air Missile (AMRAAM)	07	51,374	57,293		57,293	U
186	0207227F	Combat Rescue - Pararescue	07	685	647		647	U

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169	0101313F	Integrated Strategic Planning and Analysis Network (ISPAN) - USSTRATCOM	07						U
170	0101316F	Worldwide Joint Strategic Communications	07	18,177				18,177	U
171	0101324F	Integrated Strategic Planning & Analysis Network	07	24,261				24,261	U
172	0101328F	ICBM Reentry Vehicles	07	75,571				75,571	U
174	0102110F	UH-1N Replacement Program	07	170,975				170,975	U
175	0102326F	Region/Sector Operation Control Center Modernization Program	07						U
176	0205219F	MQ-9 UAV	07	154,996				154,996	U
177	0205671F	Joint Counter RCIED Electronic Warfare	07			4,000	4,000	4,000	U
178	0207131F	A-10 Squadrons	07	36,816				36,816	U
179	0207133F	F-16 Squadrons	07	193,013				193,013	U
180	0207134F	F-15E Squadrons	07	336,079				336,079	U
181	0207136F	Manned Destructive Suppression	07	15,521				15,521	U
182	0207138F	F-22A Squadrons	07	496,298				496,298	U
183	0207142F	F-35 Squadrons	07	99,943				99,943	U
184	0207161F	Tactical AIM Missiles	07	10,314				10,314	U
185	0207163F	Advanced Medium Range Air-to-Air Missile (AMRAAM)	07	55,384				55,384	U
186	0207227F	Combat Rescue - Pararescue	07	281				281	U

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187	0207247F	AF TENCAP	07					U
188	0207249F	Precision Attack Systems Procurement	07	1,651	14,891		14,891	U
189	0207253F	Compass Call	07	34,240	43,901		43,901	U
190	0207268F	Aircraft Engine Component Improvement Program	07	105,664	121,203		121,203	U
191	0207325F	Joint Air-to-Surface Standoff Missile (JASSM)	07	29,436	42,472		42,472	U
192	0207410F	Air & Space Operations Center (AOC)	07	86,456	104,954		104,954	U
193	0207412F	Control and Reporting Center (CRC)	07	2,374	6,413		6,413	U
194	0207417F	Airborne Warning and Control System (AWACS)	07	118,702	112,280		112,280	U
195	0207418F	Tactical Airborne Control Systems	07	3,522	2,659		2,659	U
197	0207431F	Combat Air Intelligence System Activities	07	15,821	10,316		10,316	U
198	0207444F	Tactical Air Control Party-Mod	07	10,623	6,149		6,149	U
199	0207448F	C2ISR Tactical Data Link	07	1,754	538		538	U
200	0207452F	DCAPES	07	12,423	13,248		13,248	U
201	0207573F	National Technical Nuclear Forensics	07	2,307	1,788		1,788	U
202	0207590F	Seek Eagle	07	25,304	24,699		24,699	U
203	0207601F	USAF Modeling and Simulation	07	9,803	17,078		17,078	U
204	0207605F	Wargaming and Simulation Centers	07	12,369	6,141		6,141	U
205	0207610F	Battlefield Abn Comm Node (BACN)	07			42,349	42,349	U

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187	0207247F	AF TENCAP	07	21,365				21,365	U
188	0207249F	Precision Attack Systems Procurement	07	10,696				10,696	U
189	0207253F	Compass Call	07	15,888				15,888	U
190	0207268F	Aircraft Engine Component Improvement Program	07	112,505				112,505	U
191	0207325F	Joint Air-to-Surface Standoff Missile (JASSM)	07	78,498				78,498	U
192	0207410F	Air & Space Operations Center (AOC)	07	114,864				114,864	U
193	0207412F	Control and Reporting Center (CRC)	07	8,109				8,109	U
194	0207417F	Airborne Warning and Control System (AWACS)	07	67,996				67,996	U
195	0207418F	Tactical Airborne Control Systems	07	2,462				2,462	U
197	0207431F	Combat Air Intelligence System Activities	07	13,668				13,668	U
198	0207444F	Tactical Air Control Party-Mod	07	6,217				6,217	U
199	0207448F	C2ISR Tactical Data Link	07						U
200	0207452F	DCAPES	07	19,910				19,910	U
201	0207573F	National Technical Nuclear Forensics	07	1,788				1,788	U
202	0207590F	Seek Eagle	07	28,237				28,237	U
203	0207601F	USAF Modeling and Simulation	07	15,725				15,725	U
204	0207605F	Wargaming and Simulation Centers	07	4,316				4,316	U
205	0207610F	Battlefield Abn Comm Node (BACN)	07	26,946				26,946	U

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206	0207697F	Distributed Training and Exercises	07	4,046	3,825		3,825	U
207	0208006F	Mission Planning Systems	07	82,054	63,074		63,074	U
208	0208007F	Tactical Deception	07	3,623	6,949		6,949	U
209	0208064F	OPERATIONAL HQ - CYBER	07					U
210	0208087F	Distributed Cyber Warfare Operations	07	38,241	40,168		40,168	U
211	0208088F	AF Defensive Cyberspace Operations	07	19,628	38,387		38,387	U
212	0208097F	Joint Cyber Command and Control (JCC2)	07		13,000		13,000	U
213	0208099F	Unified Platform (UP)	07		26,559		26,559	U
217	0208288F	Intel Data Applications	07			1,200	1,200	U
218	0301017F	Global Sensor Integrated on Network (GSIN)	07	3,439	3,579		3,579	U
219	0301025F	GeoBase	07					U
220	0301112F	Nuclear Planning and Execution System (NPES)	07	5,056	29,620		29,620	U
226	0301401F	Air Force Space and Cyber Non-Traditional ISR for Battlespace Awareness	07	3,721	6,633		6,633	U
227	0302015F	E-4B National Airborne Operations Center (NAOC)	07	37,481	57,758		57,758	U
228	0303131F	Minimum Essential Emergency Communications Network (MEECN)	07	34,466	64,543		64,543	U
229	0303133F	High Frequency Radio Systems	07		51,612		51,612	U
230	0303140F	Information Systems Security Program	07	41,067	33,979		33,979	U

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206	0207697F	Distributed Training and Exercises	07	4,303				4,303	U
207	0208006F	Mission Planning Systems	07	71,465				71,465	U
208	0208007F	Tactical Deception	07	7,446				7,446	U
209	0208064F	OPERATIONAL HQ - CYBER	07	7,602				7,602	U
210	0208087F	Distributed Cyber Warfare Operations	07	35,178				35,178	U
211	0208088F	AF Defensive Cyberspace Operations	07	16,609				16,609	U
212	0208097F	Joint Cyber Command and Control (JCC2)	07	11,603				11,603	U
213	0208099F	Unified Platform (UP)	07	84,702				84,702	U
217	0208288F	Intel Data Applications	07			1,200	1,200	1,200	U
218	0301017F	Global Sensor Integrated on Network (GSIN)	07						U
219	0301025F	GeoBase	07	2,723				2,723	U
220	0301112F	Nuclear Planning and Execution System (NPES)	07	44,190				44,190	U
226	0301401F	Air Force Space and Cyber Non-Traditional ISR for Battlespace Awareness	07	3,575				3,575	U
227	0302015F	E-4B National Airborne Operations Center (NAOC)	07	70,173				70,173	U
228	0303131F	Minimum Essential Emergency Communications Network (MEECN)	07	13,543				13,543	U
229	0303133F	High Frequency Radio Systems	07	15,881				15,881	U
230	0303140F	Information Systems Security Program	07	27,726				27,726	U

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231	0303141F	Global Combat Support System	07	101				U
232	0303142F	Global Force Management - Data Initiative	07	1,944	2,170		2,170	U
234	0304115F	Multi Domain Command and Control (MDC2)	07					U
235	0304260F	Airborne SIGINT Enterprise	07	116,186	109,873		109,873	U
236	0304310F	Commercial Economic Analysis	07	3,544	3,472		3,472	U
239	0305015F	C2 Air Operations Suite - C2 Info Services	07		8,608		8,608	U
240	0305020F	CCMD Intelligence Information Technology	07	1,542	1,586		1,586	U
241	0305022F	ISR Modernization & Automation Dvmt (IMAD)	07					U
242	0305099F	Global Air Traffic Management (GATM)	07	4,887	4,106		4,106	U
243	0305111F	Weather Service	07	35,689	31,615	3,000	34,615	U
244	0305114F	Air Traffic Control, Approach, and Landing System (ATCALS)	07	5,791	13,271		13,271	U
245	0305116F	Aerial Targets	07	20,944	6,683		6,683	U
248	0305128F	Security and Investigative Activities	07	400	418		418	U
249	0305145F	Arms Control Implementation	07		21,374		21,374	U
250	0305146F	Defense Joint Counterintelligence Activities	07	4,520	3,845		3,845	U
252	0305179F	Integrated Broadcast Service (IBS)	07					U

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231	0303141F	Global Combat Support System	07						U
232	0303142F	Global Force Management - Data Initiative	07	2,210				2,210	U
234	0304115F	Multi Domain Command and Control (MDC2)	07	150,880				150,880	U
235	0304260F	Airborne SIGINT Enterprise	07	102,667				102,667	U
236	0304310F	Commercial Economic Analysis	07	3,431				3,431	U
239	0305015F	C2 Air Operations Suite - C2 Info Services	07	9,313				9,313	U
240	0305020F	CCMD Intelligence Information Technology	07	1,121				1,121	U
241	0305022F	ISR Modernization & Automation Dvmt (IMAD)	07	19,000				19,000	U
242	0305099F	Global Air Traffic Management (GATM)	07	4,544				4,544	U
243	0305111F	Weather Service	07	25,461				25,461	U
244	0305114F	Air Traffic Control, Approach, and Landing System (ATCALS)	07	5,651				5,651	U
245	0305116F	Aerial Targets	07	7,448				7,448	U
248	0305128F	Security and Investigative Activities	07	425				425	U
249	0305145F	Arms Control Implementation	07	54,546				54,546	U
250	0305146F	Defense Joint Counterintelligence Activities	07	6,858				6,858	U
252	0305179F	Integrated Broadcast Service (IBS)	07	8,728				8,728	U

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253	0305202F	Dragon U-2	07	34,486	65,518	22,100	87,618	U
254	0305205F	Endurance Unmanned Aerial Vehicles	07	40,000	15,000		15,000	U
255	0305206F	Airborne Reconnaissance Systems	07	19,450	195,334		195,334	U
256	0305207F	Manned Reconnaissance Systems	07	14,297	14,223		14,223	U
257	0305208F	Distributed Common Ground/Surface Systems	07	38,064	24,554	29,500	54,054	U
258	0305220F	RQ-4 UAV	07	222,693	221,690		221,690	U
259	0305221F	Network-Centric Collaborative Targeting	07	14,837	14,288		14,288	U
260	0305238F	NATO AGS	07	44,729	51,527		51,527	U
261	0305240F	Support to DCGS Enterprise	07	26,349	26,579		26,579	U
262	0305600F	International Intelligence Technology and Architectures	07	9,491	8,464		8,464	U
263	0305881F	Rapid Cyber Acquisition	07	4,720	4,303		4,303	U
264	0305984F	Personnel Recovery Command & Ctrl (PRC2)	07	2,364	2,466		2,466	U
265	0307577F	Intelligence Mission Data (IMD)	07	8,684	4,117		4,117	U
266	0401115F	C-130 Airlift Squadron	07	10,219	105,988		105,988	U
267	0401119F	C-5 Airlift Squadrons (IF)	07	11,433	25,071		25,071	U
268	0401130F	C-17 Aircraft (IF)	07	21,701	48,299		48,299	U
269	0401132F	C-130J Program	07	24,908	15,409		15,409	U
270	0401134F	Large Aircraft IR Countermeasures (LAIRCM)	07	5,095	4,334		4,334	U

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253	0305202F	Dragon U-2	07	38,939				38,939	U
254	0305205F	Endurance Unmanned Aerial Vehicles	07						U
255	0305206F	Airborne Reconnaissance Systems	07	122,909				122,909	U
256	0305207F	Manned Reconnaissance Systems	07	11,787				11,787	U
257	0305208F	Distributed Common Ground/Surface Systems	07	25,009				25,009	U
258	0305220F	RQ-4 UAV	07	191,733				191,733	U
259	0305221F	Network-Centric Collaborative Targeting	07	10,757				10,757	U
260	0305238F	NATO AGS	07	32,567				32,567	U
261	0305240F	Support to DCGS Enterprise	07	37,774				37,774	U
262	0305600F	International Intelligence Technology and Architectures	07	13,515				13,515	U
263	0305881F	Rapid Cyber Acquisition	07	4,383				4,383	U
264	0305984F	Personnel Recovery Command & Ctrl (PRC2)	07	2,133				2,133	U
265	0307577F	Intelligence Mission Data (IMD)	07	8,614				8,614	U
266	0401115F	C-130 Airlift Squadron	07	140,425				140,425	U
267	0401119F	C-5 Airlift Squadrons (IF)	07	10,223				10,223	U
268	0401130F	C-17 Aircraft (IF)	07	25,101				25,101	U
269	0401132F	C-130J Program	07	8,640				8,640	U
270	0401134F	Large Aircraft IR Countermeasures (LAIRCM)	07	5,424				5,424	U

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271	0401218F	KC-135s	07	8,645	3,493		3,493	U
272	0401219F	KC-10s	07	9,181	6,569		6,569	U
273	0401314F	Operational Support Airlift	07	5,196	3,172		3,172	U
274	0401318F	CV-22	07	17,744	16,502		16,502	U
275	0401840F	AMC Command and Control System	07	3,394	1,688		1,688	U
276	0408011F	Special Tactics / Combat Control	07	7,726	2,433		2,433	U
277	0702207F	Depot Maintenance (Non-IF)	07	1,517	1,897		1,897	U
278	0708055F	Maintenance, Repair & Overhaul System	07	28,726	50,933		50,933	U
279	0708610F	Logistics Information Technology (LOGIT)	07	23,332	13,479		13,479	U
280	0708611F	Support Systems Development	07	11,362	4,497		4,497	U
281	0804743F	Other Flight Training	07	1,998	2,022		2,022	U
282	0808716F	Other Personnel Activities	07	103	108		108	U
283	0901202F	Joint Personnel Recovery Agency	07	1,933	2,023		2,023	U
284	0901218F	Civilian Compensation Program	07	2,905	3,561		3,561	U
285	0901220F	Personnel Administration	07	5,404	4,258		4,258	U
286	0901226F	Air Force Studies and Analysis Agency	07	1,506	1,418		1,418	U
287	0901538F	Financial Management Information Systems Development	07	87,802	93,418		93,418	U
288	0901554F	Defense Enterprise Acntng and Mgt Sys (DEAMS)	07					U

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271	0401218F	KC-135s	07						U
272	0401219F	KC-10s	07	20				20	U
273	0401314F	Operational Support Airlift	07						U
274	0401318F	CV-22	07	17,906				17,906	U
275	0401840F	AMC Command and Control System	07						U
276	0408011F	Special Tactics / Combat Control	07	3,629				3,629	U
277	0702207F	Depot Maintenance (Non-IF)	07	1,890				1,890	U
278	0708055F	Maintenance, Repair & Overhaul System	07	10,311				10,311	U
279	0708610F	Logistics Information Technology (LOGIT)	07	16,065				16,065	U
280	0708611F	Support Systems Development	07	539				539	U
281	0804743F	Other Flight Training	07	2,057				2,057	U
282	0808716F	Other Personnel Activities	07	10				10	U
283	0901202F	Joint Personnel Recovery Agency	07	2,060				2,060	U
284	0901218F	Civilian Compensation Program	07	3,809				3,809	U
285	0901220F	Personnel Administration	07	6,476				6,476	U
286	0901226F	Air Force Studies and Analysis Agency	07	1,443				1,443	U
287	0901538F	Financial Management Information Systems Development	07	9,323				9,323	U
288	0901554F	Defense Enterprise Acntng and Mgt Sys (DEAMS)	07	46,789				46,789	U

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Line No	Program Element Number	Item	Act	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 Total Enacted	Sec
289	1201017F	Global Sensor Integrated on Network (GSIN)	07					U
290	1201921F	Service Support to STRATCOM - Space Activities	07	13,769	14,161		14,161	U
291	1202140F	Service Support to SPACECOM Activities	07					U
292	1202247F	AF TENCAP	07	80,726	26,986	5,000	31,986	U
293	1203001F	Family of Advanced BLoS Terminals (FAB-T)	07	26,262	60,168		60,168	U
294	1203110F	Satellite Control Network (SPACE)	07	18,133	26,440		26,440	U
296	1203165F	NAVSTAR Global Positioning System (Space and Control Segments)	07	7,681	8,937		8,937	U
297	1203173F	Space and Missile Test and Evaluation Center	07	43,715	79,935		79,935	U
298	1203174F	Space Innovation, Integration and Rapid Technology Development	07	9,081	21,019		21,019	U
299	1203179F	Integrated Broadcast Service (IBS)	07	8,747	8,568		8,568	U
300	1203182F	Spacelift Range System (SPACE)	07	20,035	20,168		20,168	U
301	1203265F	GPS III Space Segment	07	233,043	141,892		141,892	U
302	1203400F	Space Superiority Intelligence	07	10,691	16,278		16,278	U
303	1203614F	JSpOC Mission System	07	125,191	70,383		70,383	U
304	1203620F	National Space Defense Center	07	18,052	55,309		55,309	U
305	1203699F	Shared Early Warning (SEW)	07	1,327				U
306	1203873F	Ballistic Missile Defense Radars	07					U

R-120PB: FY 2020 President's Budget (Published Version), as of February 19, 2019 at 15:33:03

Department of the Air Force
FY 2020 President's Budget
Exhibit R-1 FY 2020 President's Budget
Total Obligational Authority
(Dollars in Thousands)

19 Feb 2019

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

Line No	Program Element Number	Item	Act	FY 2020 Base	FY 2020 OCO for Base Requirements	FY 2020 OCO for Direct War and Enduring Costs	FY 2020 Total OCO	FY 2020 Total (Base + OCO)	Sec
289	1201017F	Global Sensor Integrated on Network (GSIN)	07	3,647				3,647	U
290	1201921F	Service Support to STRATCOM - Space Activities	07	988				988	U
291	1202140F	Service Support to SPACECOM Activities	07	11,863				11,863	U
292	1202247F	AF TENCAP	07						U
293	1203001F	Family of Advanced BLoS Terminals (FAB-T)	07	197,388				197,388	U
294	1203110F	Satellite Control Network (SPACE)	07	61,891				61,891	U
296	1203165F	NAVSTAR Global Positioning System (Space and Control Segments)	07						U
297	1203173F	Space and Missile Test and Evaluation Center	07	4,566				4,566	U
298	1203174F	Space Innovation, Integration and Rapid Technology Development	07	43,292				43,292	U
299	1203179F	Integrated Broadcast Service (IBS)	07						U
300	1203182F	Spacelift Range System (SPACE)	07	10,837				10,837	U
301	1203265F	GPS III Space Segment	07	42,440				42,440	U
302	1203400F	Space Superiority Intelligence	07	14,428				14,428	U
303	1203614F	JSpOC Mission System	07	72,762				72,762	U
304	1203620F	National Space Defense Center	07	2,653				2,653	U
305	1203699F	Shared Early Warning (SEW)	07						U
306	1203873F	Ballistic Missile Defense Radars	07	15,881				15,881	U

R-120PB: FY 2020 President's Budget (Published Version), as of February 19, 2019 at 15:33:03

Department of the Air Force
FY 2020 President's Budget
Exhibit R-1 FY 2020 President's Budget
Total Obligational Authority
(Dollars in Thousands)

19 Feb 2019

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

Line No	Program Element Number	Item	Act	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 Total Enacted	Sec
307	1203906F	NCMC - TW/AA System	07	5,000				U
308	1203913F	NUDET Detection System (SPACE)	07	31,304	19,778		19,778	U
309	1203940F	Space Situation Awareness Operations	07	86,173	19,572		19,572	U
310	1206423F	Global Positioning System III - Operational Control Segment	07	492,986	509,258		509,258	U
311	1206770F	Enterprise Ground Services	07					U
9999	9999999999	Classified Programs		16,789,633	16,859,524	161,790	17,021,314	U
		Operational Systems Development		22,442,379	23,153,697	308,439	23,462,136	
		Total Research, Development, Test & Eval, AF		38,077,597	41,166,683	321,934	41,488,617	

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Department of the Air Force
FY 2020 President's Budget
Exhibit R-1 FY 2020 President's Budget
Total Obligational Authority
(Dollars in Thousands)

19 Feb 2019

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

Line No	Program Element Number	Item	Act	FY 2020 Base	FY 2020 OCO for Base Requirements	FY 2020 OCO for Direct War and Enduring Costs	FY 2020 Total OCO	FY 2020 Total (Base + OCO)	Sec
307	1203906F	NCMC - TW/AA System	07						U
308	1203913F	NUDET Detection System (SPACE)	07	49,300				49,300	U
309	1203940F	Space Situation Awareness Operations	07	17,834				17,834	U
310	1206423F	Global Positioning System III - Operational Control Segment	07	445,302				445,302	U
311	1206770F	Enterprise Ground Services	07	138,870				138,870	U
9999	9999999999	Classified Programs		18,029,506	322,000	78,713	400,713	18,430,219	U
		Operational Systems Development		24,529,488		83,913	405,913	24,935,401	
Total Research, Development, Test & Eval, AF				45,616,122		128,248	450,248	46,066,370	

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

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

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

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

Fiscal Year (FY) 2020 Budget Estimates

RDT&E Exhibits in Budget Activity 7

are split into two books:

Vol-III Part 1

Vol-III Part 2

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The following Program Elements are not providing RDT&E exhibits due to classification:

0101815F	ADVANCED STRATEGIC PROGRAM
0207424F	EVALUATION AND ANALYSIS PROGRAM
0208161F	SPECIAL EVALUATION SYSTEM
0208162F	ADVANCED TECHNOLOGY PROGRAM
0301310F	NATIONAL AIR INTELLIGENCE CENTER
0301314F	COBRA BALL
0301315F	MISSILE AND SPACE TECHICAL COLLECTION
0301324F	FOREST GREEN
0301386F	GDIP COLLECTION MANAGEMENT
0304111F	SPECIAL ACTIVITES
0304311F	SELECTED ACTIVITIES
0304348F	ADVANCED GEOSPATIAL INTELLIGENCE (AGI)
0305124F	SPECIAL APPLICATIONS PROGRAM
0305127F	FOREIGN COUNTERINTELLIGENCE ACTIVITES
0305159F	DEFENSE RECONNAISSANCE SUPPORT ACTIVITIES
0305172F	COMBINED ADVANCED APPLICATIONS
0604446F	WIDE AREA SURVEILLANCE - SP
0605798F	ANALYSIS SUPPORT GROUP

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0301017F / *Global Sensor Integrated on Network (GSIN)*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	3.439	3.579	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
675368: *GSIN (Global Integrated Sensor Network)*	-	3.439	3.579	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2020, PE 0301017F, Global Sensor Integrated on Network (GSIN), Project 675368, GSIN (Global Integrated Sensor Network, efforts were transferred to PE 1201017F, Global Sensor Integrated on Network (GSIN), Project Project 675368, GSIN (Global Integrated Sensor Network, for more accurate classification of work.

A. Mission Description and Budget Item Justification

The mission of USSTRATCOM is to establish and provide full-spectrum, global strike, coordinated space and information operations capabilities to meet both deterrent and decisive national security objectives and to provide operational space support, integrated missile defense, Global Command Control, Communications, and Computers Intelligence Surveillance and Reconnaissance (C4ISR), and specialized planning expertise to the joint warfighter.

The Nation's strategic C2 sensors, and mission planning programs cannot rapidly exchange information across multiple missions creating ambiguity that delays time critical national C2 decision making processes. GSIN developed and established a unified schema that integrates disparate Missile Warning/Missile Defense (MW/MD) data into a single exposed data set providing redundant and unambiguous MW/MD data to national leadership. GSIN also enables existing radars and sensors to provide data in net-centric formats consumable by other authorized systems and mission areas, thus reducing the need to acquire more systems. Activities also include studies and analysis to support both current program planning, execution, and future program planning.

GSIN directly supports USSTRATCOM and other COCOMs and MAJCOM mission sets. GSIN meshes together selected systems and sensors (from tactical to strategic), including the Nation's most modern and capable assets, taking advantage of their larger numbers, improved algorithms, mobility, and forward deployment to provide earlier cross-cueing and expanded decision space when every second counts. Repurposing these traditionally stove-piped systems and sensors, GSIN enables the warfighter in several ways. GSIN enables creation of a User Defined Operating Picture (UDOP) to provide a single, unambiguous missile event picture allowing real-time collaboration for nuclear C2 and improved senior leader situational awareness (SA) for effective decision-making. GSIN also improves Space Situational Awareness (SSA) by tapping additional sensor capability and provides this data for the larger space order of battle capabilities. GSIN dramatically improves the ingestion of non-traditional, but readily available, non-US government and commercial data to the Air Force Space Command (AFSPC) catalog managed by the 18SPCC at Vandenberg AFB. GSIN addresses NORTHCOM/STRATCOM's signed Joint Emergent Operational Need (JEON) ST-0010 request for uninterrupted traditional and non-traditional sensor data integration and the Global Threat Characterization Assessment (GTCA) Operational Planning Team report. GSIN provides critical and unique data to the large AFSPC SSA data repositories to facilitate the large Space Battle Management Command and Control (BMC2) suite of capabilities/programs. Finally, GSIN provides Machine Learner and Data Analysis functions to optimize and operate situational awareness in the field.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0301017F / *Global Sensor Integrated on Network (GSIN)*

This program element may include necessary civilian pay expenses required to manage, execute, and deliver <insert program name> weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F,0605828F, 0605829F, 0605830F, 0605831F, 0605832F, and 0605898F.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	3.549	3.579	3.647	0.000	3.647
Current President's Budget	3.439	3.579	0.000	0.000	0.000
Total Adjustments	-0.110	0.000	-3.647	0.000	-3.647
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.110	0.000			
• Other Adjustments	0.000	0.000	-3.647	0.000	-3.647

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Radar, sensor, technical intelligence (TI), and Allied Systems	2.210	2.007	0.000
Description: Radar, sensor, technical intelligence and Allied Systems: Designs, develops, exposes and integrates data from radar, sensors and technical intelligence systems in regions of the world where potential GSIN users currently do not have coverage. Provide real time data from systems that previously reported in hours or days after critical events. Conduct studies/ surveys/meetings as necessary to continually identify systems meeting GSIN user data exposure needs. Space Situational Awareness (SSA): Designs, develops, tests, exposes, and integrates SSA data from previously untapped systems into space production systems and the Global Information Grid (GIG). Develop implementation plans to mature data exposure capabilities.			
FY 2019 Plans:			

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0301017F / *Global Sensor Integrated on Network (GSIN)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Complete testing and troubleshooting of NC2. Transition capability to program of record (PoR) - Complete deployment and testing Radar/Sensor/TI Project 2 and transition to PoR - Complete deployment and testing Radar/Sensor/TI Project 3 and transition to PoR - Identify and begin development of Radar/Sensor/TI Project 4. - Initiate Strategic Study concept to identify the next series of radars/sensors for GSIN data exposure ***FY 2020 Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** In FY 2020, PE 0301017F, Global Sensor Integrated on Network (GSIN), Project 675368, GSIN (Global Integrated Sensor Network, efforts were transferred to PE 1201017F, Global Sensor Integrated on Network (GSIN), Project Project 675368, GSIN (Global Integrated Sensor Network, for more accurate classification of work.			
Title: Data Services, Net Centric Integration and Configuration Control, and program outreach	1.229	1.572	0.000
Description: Develop common XML net-enabled data schemas and configuration management processes and procedures for Missile Warning, Missile Defense, Space, MASINT/Technical Intelligence, and Sensor data to manage the XML schema and associated XML messaging and services. Develop technical outreach for potential new GSIN data consumers and providers who require GSIN sensor data. Upgrade GSIN capabilities as DISA Enterprise Services evolve. Continue modifications to data services. Support integration of GSIN sensor data into appropriate registries/catalogs. Continue development of GSIN data services to enable visualization in a common operating picture. Conduct studies and demonstrations of SSA capabilities, data correlation, and assessment services for risk reduction evaluations. ***FY 2019 Plans:*** - Complete deploying and testing of GAP-CIE modification allowing GSIN sensors reporting operational capability (OPSCAP) status in real time. Hand-off effort to Program of Record (PoR) - Investigated the ability to record GSIN exposed data and play it back in real time through a visualization tool - Continue developing plans to address NORTHCOM/USSTRATCOM JEON GTCA. Advocate and secure addition RDT&E funding if necessary - Continue development of new and improved data services. -- Begin development and integration of Radar/Sensor/TI Project 4 into DISA Enterprise Services ***FY 2020 Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:***			

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0301017F / *Global Sensor Integrated on Network (GSIN)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
In FY 2020, PE 0301017F, Global Sensor Integrated on Network (GSIN), Project 675368, GSIN (Global Integrated Sensor Network, efforts were transferred to PE 1201017F, Global Sensor Integrated on Network (GSIN), Project Project 675368, GSIN (Global Integrated Sensor Network, for more accurate classification of work.			
Accomplishments/Planned Programs Subtotals	3.439	3.579	0.000

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• N/A: *N/A*	-	-	-	-	-	-	-	-	-	0.000	0.000

Remarks

E. Acquisition Strategy

GSIN uses existing government contract vehicles (from agencies such as Missile Defense Agency (MDA) or Air Force Life Cycle Management Center (AFLCMC) to develop and modernize the combined SSA/MW/MD/MASINT/TI data exposure architecture and solution. The contracts are managed by the relevant organizations contracting office. GSIN does not award or manage any contracts.

The AFLCMC at Hanscom AFB, (AFLCMC/HB) provides necessary program management, financial management, and other support as may be applicable for GSIN.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0301017F / *Global Sensor Integrated on Network (GSIN)*	Project (Number/Name) 675368 / *GSIN (Global Integrated Sensor Network)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GSIN OPSCAP Status Capability	C/CPAF	Northrop Grumman : Omaha, NE	-	1.495	Mar 2018	-		-		-		-	Continuing	Continuing	-
GSIN Non-traditional Space Situational Awareness Data Exposure	C/CPAF	Harris Group : Colorado Springs, CO	-	-		-		-		-		-	Continuing	Continuing	-
GSIN Net-centric Command and Control Data Exposure	C/CPAF	LM : Huntsville, AL	-	-		-		-		-		-	Continuing	Continuing	-
GSIN Space Situational Awareness Data Exposure - Project 2	C/CPAF	Raytheon : Boston, MA	-	0.918	May 2018	-		-		-		-	Continuing	Continuing	-
GSIN Space Situational Awareness Data Exposure - Project 3	C/CPAF	Raytheon : Colorado Springs, CO	-	0.506	Jul 2018	0.800	Jul 2019	-		-		-	Continuing	Continuing	-
GSIN Space Situational Awareness Data Exposure - Radar/Sensor/TI Project 4	C/CPAF	Raytheon : Colorado Springs, CO	-	-		1.749	Dec 2018	-		-		-	Continuing	Continuing	-
GSIN Space Situational Awareness Data Exposure - Radar/Sensor/TI Project 5	C/CPAF	Raytheon : Colorado Springs, CO	-	-		-		-		-		-	Continuing	Continuing	-
GSIN Space Situational Awareness Data Exposure - Radar/Sensor/TI Project 6	TBD	Raytheon : Boston, MA	-	-		-		-		-		-	Continuing	Continuing	-
GSIN Space Situational Awareness Data Exposure - Radar/Sensor/TI Project 7	TBD	Raytheon : Colorado Springs, CO	-	-		-		-		-		-	Continuing	Continuing	-
Publisher/Recorder	C/CPAF	Northrop Grumman : Omaha, NE	-	-		-		-		-		-	Continuing	Continuing	-
Strategic Study	C/CPAF	KBR Wyle : Omaha, ND	-	-		0.500	Nov 2018	-		-		-	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0301017F / *Global Sensor Integrated on Network (GSIN)*	Project (Number/Name) 675368 / *GSIN (Global Integrated Sensor Network)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	2.919		3.049		-		-		-	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GSIN Program Management Administration	C/FFP	Various : Omaha, NE	-	0.520	Oct 2017	0.530	Oct 2018	-		-		-	Continuing	Continuing	-
		Subtotal	-	0.520		0.530		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	3.439		3.579		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0301017F / *Global Sensor Integrated on Network (GSIN)*	**Project (Number/Name)** 675368 / *GSIN (Global Integrated Sensor Network)*

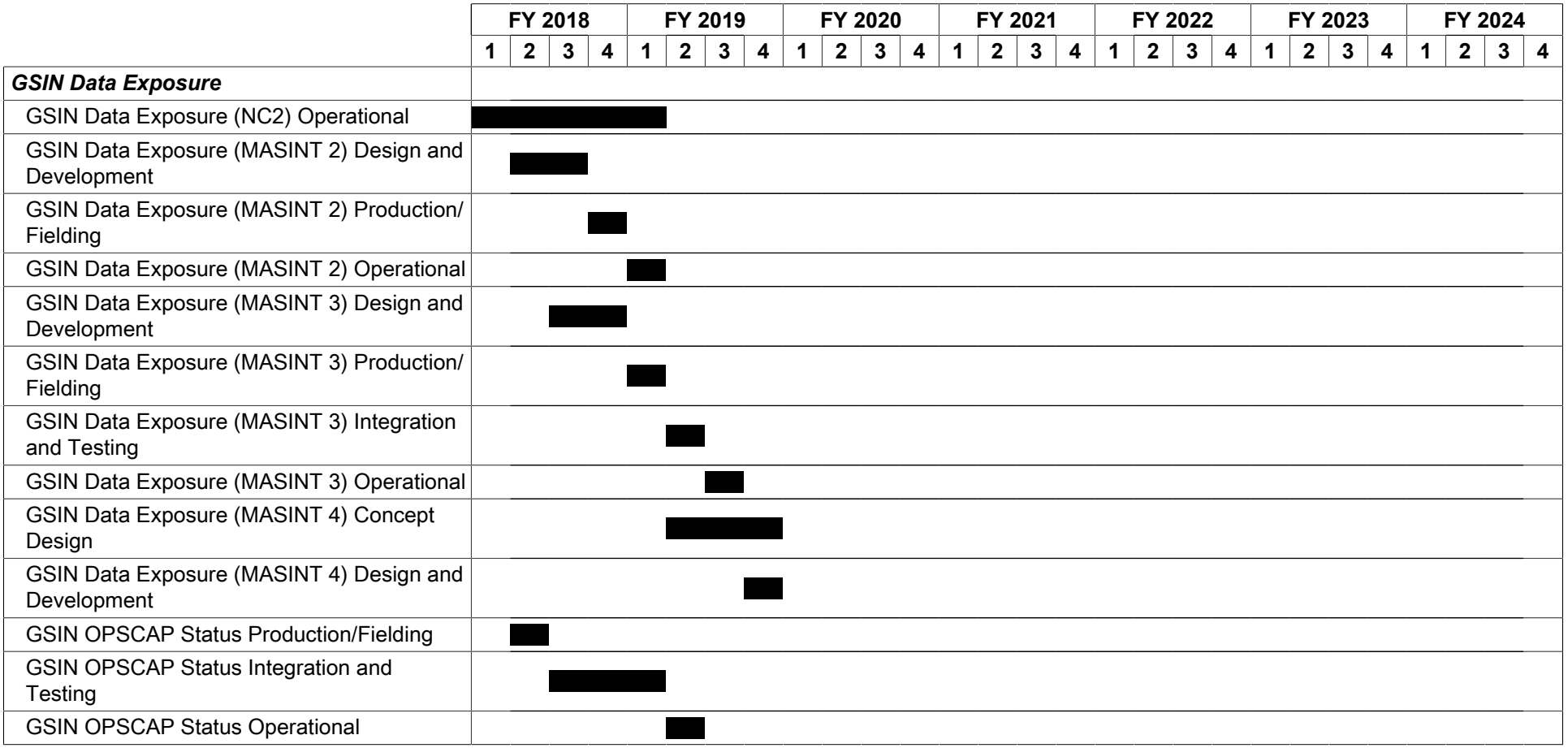

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0301017F / *Global Sensor Integrated on Network (GSIN)*	**Project (Number/Name)** 675368 / *GSIN (Global Integrated Sensor Network)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
GSIN Data Exposure				
GSIN Data Exposure (NC2) Operational	1	2018	1	2019
GSIN Data Exposure (MASINT 2) Design and Development	2	2018	3	2018
GSIN Data Exposure (MASINT 2) Production/Fielding	4	2018	4	2018
GSIN Data Exposure (MASINT 2) Operational	1	2019	1	2019
GSIN Data Exposure (MASINT 3) Design and Development	3	2018	4	2018
GSIN Data Exposure (MASINT 3) Production/Fielding	1	2019	1	2019
GSIN Data Exposure (MASINT 3) Integration and Testing	2	2019	2	2019
GSIN Data Exposure (MASINT 3) Operational	3	2019	3	2019
GSIN Data Exposure (MASINT 4) Concept Design	2	2019	4	2019
GSIN Data Exposure (MASINT 4) Design and Development	4	2019	4	2019
GSIN OPSCAP Status Production/Fielding	2	2018	2	2018
GSIN OPSCAP Status Integration and Testing	3	2018	1	2019
GSIN OPSCAP Status Operational	2	2019	2	2019

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0301025F / *GeoBase*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	0.000	0.000	2.723	0.000	2.723	2.772	2.827	2.878	2.930	Continuing	Continuing
673280: *Ceit01*	-	0.000	0.000	2.723	0.000	2.723	2.772	2.827	2.878	2.930	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 7, PE 0301025F, project 673280, GeoBase Development, is a new start.

A. Mission Description and Budget Item Justification

Funds development of the GeoBase Program. A key initial component of GeoBase is the Common Installation Picture (CIP) which provides the foundation upon which subsequent GeoBase spirals will be built. The CIP will be developed for active, Guard, and Reserve garrison and expeditionary installations to provide a single, interactive map of our installations. Warfighters, commanders, planners, and support personnel alike will be afforded unprecedented situational awareness to accomplish their respective missions. The functional mission sectors will be able to exploit GeoBase to achieve their objectives more effectively, their legacy data will be integrated with the CIP.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	2.723	0.000	2.723
Total Adjustments	0.000	0.000	2.723	0.000	2.723
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	2.723	0.000	2.723

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0301025F / *GeoBase*

Change Summary Explanation

FY20 funding added to budget to begin development of GeoBase.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: GeoBase Development ***Description:*** Develop Common Installation Picture (CIP)for GeoBase. ***FY 2019 Plans:*** N/A ***FY 2020 Base Plans:*** Develop CIP for GeoBase. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** This is a FY20 new start.	0.000	0.000	2.723	0.000	2.723
Accomplishments/Planned Programs Subtotals	0.000	0.000	2.723	0.000	2.723
Other Service Funding Adjustment	0.000	0.000	0.000	-	0.000
Air Force Subtotals	0.000	0.000	2.723	0.000	2.723

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

N/A

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0301025F / *GeoBase*	Project (Number/Name) 673280 / *Ceit01*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Develop GeoBase	Various	Not specified. : TBD	-	0.000		0.000		2.723	Feb 2020	-		2.723	Continuing	Continuing	-
		Subtotal	-	0.000		0.000		2.723		-		2.723	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Subtotals	-	0.000		0.000		2.723		-		2.723	Continuing	Continuing	N/A
Other Service Funding Adjustment	-	0.000		0.000		0.000		-		0.000			-
Project Cost Totals	-	0.000		0.000		2.723		-		2.723	0.000	0.000	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0301025F / *GeoBase*	**Project (Number/Name)** 673280 / *Ceit01*

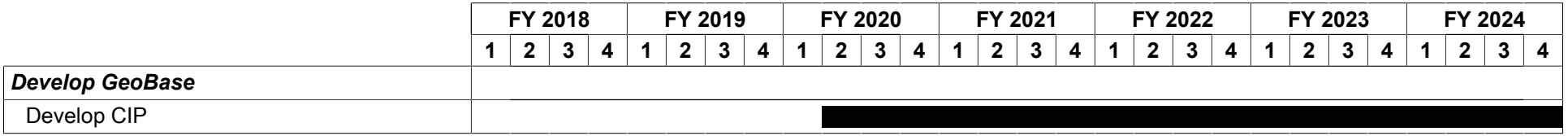

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0301025F / *GeoBase*	**Project (Number/Name)** 673280 / *Ceit01*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Develop GeoBase				
Develop CIP	2	2020	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0301112F / *Nuclear Planning and Execution System (NPES)*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	5.056	29.620	44.190	0.000	44.190	35.088	15.404	25.632	4.179	Continuing	Continuing
673768: *Nuclear Planning and Execution System (NPES)*	0.000	5.056	29.620	35.010	0.000	35.010	31.978	14.344	25.632	4.179	Continuing	Continuing
674212: *NLCC Decision Support System*	0.000	0.000	0.000	9.180	0.000	9.180	3.110	1.060	0.000	0.000	0.000	13.350

A. Mission Description and Budget Item Justification

United States Strategic Command (USSTRATCOM) conducts global operations in partnership with other combatant commands, services and U.S. government agencies to deter and detect strategic attacks against the United States. USSTRATCOM is responsible for command of U.S. nuclear capabilities, space operations, global surveillance and reconnaissance, intelligence, communications, computers, global missile defense and combatting weapons of mass destruction. To enable completion of these missions, it is recapitalizing the Nuclear Planning and Execution System (NPES). NPES is a Chairman, Joint Chiefs of Staff system for nuclear operations and fulfillment of Nuclear Command and Control (NC2) responsibilities. NPES supports national strategic deterrence by providing a host of NC2 execution activities as well as contingency and crisis action planning capabilities to selected joint and combatant command staffs. NPES is operated by USSTRATCOM and other specified users performing missions to deter and dissuade threats, and, when directed, defeat adversaries.

The NPES system has evolved from several single-purpose command and control systems over the past 30 years and has reached a point where it requires recapitalization to meet national and strategic objectives and to comply with future concepts of operation. Additionally, recapitalization is needed to improve cybersecurity, system effectiveness, and supportability. Recapitalization will also seek to lower the total cost of ownership and sustainment. The recapitalization program will use proven/mature software engineering, technologies, and design tenets to provide a modern, secure, interoperable and reliable Nuclear Command and Control (NC2) software capability.

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

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force					Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*		**R-1 Program Element (Number/Name)** PE 0301112F / *Nuclear Planning and Execution System (NPES)*			
B. Program Change Summary ($ in Millions)	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**
Previous President's Budget	4.371	29.620	35.010	0.000	35.010
Current President's Budget	5.056	29.620	44.190	0.000	44.190
Total Adjustments	0.685	0.000	9.180	0.000	9.180
• 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	0.807	0.000			
• SBIR/STTR Transfer	-0.122	0.000			
• Other Adjustments	0.000	0.000	9.180	0.000	9.180

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0301112F / *Nuclear Planning and Execution System (NPES)*	Project (Number/Name) 673768 / *Nuclear Planning and Execution System (NPES)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
673768: *Nuclear Planning and Execution System (NPES)*	0.000	5.056	29.620	35.010	0.000	35.010	31.978	14.344	25.632	4.179	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

United States Strategic Command (USSTRATCOM) conducts global operations in partnership with other combatant commands, services and U.S. government agencies to deter and detect strategic attacks against the United States. USSTRATCOM is responsible for command of U.S. nuclear capabilities, space operations, global surveillance and reconnaissance, intelligence, communications, computers, global missile defense and combatting weapons of mass destruction. To enable completion of these missions, it is recapitalizing the Nuclear Planning and Execution System (NPES). NPES is a Chairman, Joint Chiefs of Staff system for nuclear operations and fulfillment of Nuclear Command and Control (NC2) responsibilities. NPES supports national strategic deterrence by providing a host of NC2 execution activities as well as contingency and crisis action planning capabilities to selected joint and combatant command staffs. NPES is operated by USSTRATCOM and other specified users performing missions to deter and dissuade threats, and, when directed, defeat adversaries.

The NPES system has evolved from several single-purpose command and control systems over the past 30 years and has reached a point where it requires recapitalization to meet national and strategic objectives and to comply with future concepts of operation. Additionally, recapitalization is needed to improve cybersecurity, system effectiveness, and supportability. Recapitalization will also seek to lower the total cost of ownership and sustainment. The recapitalization program will use proven/mature software engineering, technologies, and design tenets to provide a modern, secure, interoperable and reliable Nuclear Command and Control (NC2) software capability. NPES will exploit AFLCMC/HBC software factory economies of scale to enable developers to build and integrate software at the Top Secret level vice paying to build duplicate capabilities at other government or contractor facilities.

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

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Nuclear Planning and Execution System (NPES) Modernization	5.056	29.620	35.010
Description: - The NPES program will use proven and mature software engineering, technologies, and design tenets to provide a modern, secure, interoperable and reliable Nuclear Command and Control (NC2) capability for USSTRATCOM and other users as appropriate. - It will update and/or replace existing system software and improve reliability and sustainability. - It will also seek to reduce total ownership cost.			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0301112F / *Nuclear Planning and Execution System (NPES)*	**Project (Number/Name)** 673768 / *Nuclear Planning and Execution System (NPES)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY 2019 Plans: FY19 will be the first year of Development and Fielding (D&F). -The NPES recap developer will use Agile Software Development to produce operational software code based on a product backlog of requirements prioritized by the user's representative and participation by the NPES user community. The developer will produce Modular Open Systems Architecture (MOSA) software for early delivery to users for evaluation in a production environment. ***FY 2020 Plans:*** -FY20 will be the second year of Development and Fielding. -The NPES recap developer will use Agile Software Development to release operational software code quarterly to user's for evaluation in a production environment. -FY20 the NPES recap developer will produce sufficient new software capability to enable the USSTRATCOM/J37 to conduct operational testing & evaluation. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding increased due to acceleration of schedule.			
Accomplishments/Planned Programs Subtotals	5.056	29.620	35.010

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPAF 03 Line Item 833140: *Strategic Command and Control*	2.330	2.278	2.317	-	2.317	2.359	2.401	2.444	2.488	Continuing	Continuing

Remarks

In FY18, PE 0303255F, Service Support to STRATCOM-C4, Project 833140, partial funding was transferred to PE 0301112F, Nuclear Planning and Execution (NPES), for better transparency.

D. Acquisition Strategy

NPES will develop, test, and field a renewed Nuclear Command and Control (NC2) capability for combatant commanders using an evolutionary (Spirals) acquisition approach with development contracts that are negotiated and awarded in a competitive environment. Additionally, select government agencies will be used to conduct relevant analyses and provide other required support. NPES will exploit AFLCMC/HBC software factory economies of scale to enable developers to build and integrate software at the Top Secret level vice paying to build duplicate capabilities at other government or contractor facilities.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0301112F / *Nuclear Planning and Execution System (NPES)*	**Project (Number/Name)** 673768 / *Nuclear Planning and Execution System (NPES)*

The Air Force Life Cycle Management Center at Hanscom AFB, (AFLCMC/HB) and the 55th CONS at Offutt AFB will be the contracting authorities for NPES and provide necessary program management, contracts, legal, and financial management support.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0301112F / *Nuclear Planning and Execution System (NPES)*	**Project (Number/Name)** 673768 / *Nuclear Planning and Execution System (NPES)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Pre Milestone B Risk Reduction	Various	NSWCDD : Offutt AFB, NE	0.000	1.976	Nov 2017	-		-		-		-	Continuing	Continuing	-
Primary Development	Various	NSWCDD : Offutt AFB, NE	0.000	-		22.002	Nov 2018	30.384	Nov 2019	-		30.384	Continuing	Continuing	-
Development Suites & Infrastructure	C/TBD	NSWCDD : Offutt AFB, NE	0.000	0.205		1.537	Jun 2019	-		-		-	Continuing	Continuing	-
		Subtotal	0.000	2.181		23.539		30.384		-		30.384	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Technical Engineering Services	Various	Various : Offutt AFB, NE	0.000	1.889	Jan 2018	3.801	Nov 2018	2.284	Nov 2019	-		2.284	Continuing	Continuing	-
		Subtotal	0.000	1.889		3.801		2.284		-		2.284	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
T&E	Various	Various : Offutt AFB, NE	0.000	0.232	Jul 2018	0.402	Nov 2018	0.413	Nov 2019	-		0.413	Continuing	Continuing	-
		Subtotal	0.000	0.232		0.402		0.413		-		0.413	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Administration	Various	Various : Offutt AFB, NE	0.000	0.754	Feb 2018	1.878	Feb 2019	1.929	Nov 2019	-		1.929	Continuing	Continuing	-
		Subtotal	0.000	0.754		1.878		1.929		-		1.929	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0301112F / *Nuclear Planning and Execution System (NPES)*	**Project (Number/Name)** 673768 / *Nuclear Planning and Execution System (NPES)*	

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	5.056		29.620		35.010		-		35.010	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0301112F / *Nuclear Planning and Execution System (NPES)*	**Project (Number/Name)** 673768 / *Nuclear Planning and Execution System (NPES)*

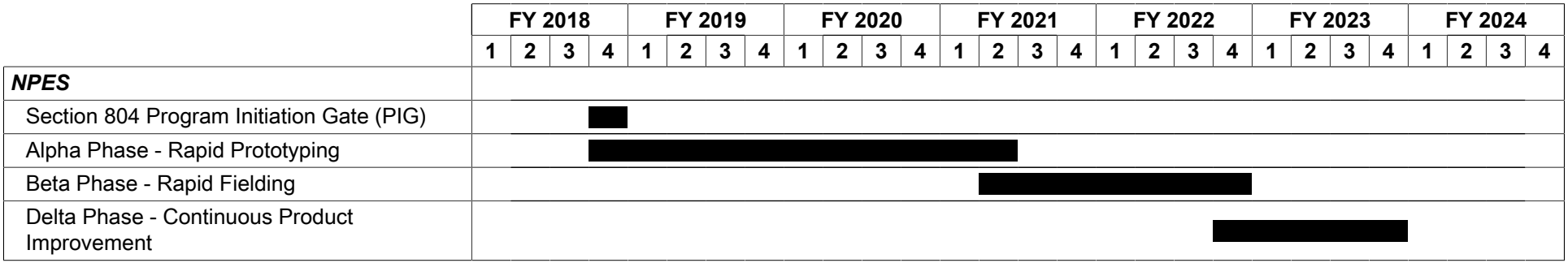


Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0301112F / *Nuclear Planning and Execution System (NPES)*	**Project (Number/Name)** 673768 / *Nuclear Planning and Execution System (NPES)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
NPES				
Section 804 Program Initiation Gate (PIG)	4	2018	4	2018
Alpha Phase - Rapid Prototyping	4	2018	2	2021
Beta Phase - Rapid Fielding	2	2021	4	2022
Delta Phase - Continuous Product Improvement	4	2022	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0301112F / *Nuclear Planning and Execution System (NPES)*	Project (Number/Name) 674212 / *NLCC Decision Support System*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
674212: *NLCC Decision Support System*	0.000	0.000	0.000	9.180	0.000	9.180	3.110	1.060	0.000	0.000	0.000	13.350
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Decision Support Service (DSS) directly supports the senior leader decision making calculus. Numerous studies, reviews and practical experience identified the need to create a decision making aid. These identified needs culminated in an Initial Capabilities Document (ICD) that was validated by the Joint Requirements Oversight Council (JROC). DSS will improve situational awareness, aggregate strategic-level information, provide a common visual display, be resilient, and mobile. Several attempts to provide a DSS-like capability has been attempted over the years. These ad hoc attempts failed due to the lack of community buy-in and a structured acquisition methodology. Today, DSS has complete community buy-in and folding it under AFLCMC ensure rigorous acquisition processes will be followed. The program will use the accelerated acquisition process known as Section 804. USSTRATCOM is the logical home for DSS. Additionally AFLCMC's Command and Control Division (HBC) has extensive expertise in developing software and visualization tools for over 30 years and is co-located with USSTRATCOM. DSS is supported by WHMO, OSD, NLCC, and CJCS. The Service provider is the United States Air Force and the Functional Manager is Air Force Global Strike Command (AFGSC).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: DSS Development	-	0.000	9.180
Description: Product Development ***FY 2019 Plans:*** New Start in FY20 ***FY 2020 Plans:*** - Initial product development - Backend development and integration - IT infrastructure and security - Strategic Study ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY20 New Start			
Accomplishments/Planned Programs Subtotals	-	0.000	9.180

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0301112F / *Nuclear Planning and Execution System (NPES)*	**Project (Number/Name)** 674212 / *NLCC Decision Support System*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

DSS will develop, test, and field a decision support system capability for use from the combatant commander and above. DSS will use agile development to rapidly prototype, develop software, and field the solutions. DSS will use existing government contract vehicles when advantageous or create development contracts that are negotiated and awarded in a competitive environment. This program will be using the Section 804 acquisitions process to accelerate delivery of a finished product. Section 804 outlines authority granted to DoD in the FY2016 National Defense Acquisitions Act to rapidly prototype/field capabilities distinct from the traditional DoD 5000 acquisition system.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0301112F / *Nuclear Planning and Execution System (NPES)*	**Project (Number/Name)** 674212 / *NLCC Decision Support System*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	Various	TBD : TBD	0.000	-		-		4.180	Oct 2019	-		4.180	0.000	4.180	-
Backend Development and Integration	TBD	TBD : TBD	0.000	-		-		1.500	Nov 2019	-		1.500	0.000	1.500	-
IT Infrastructure and Security	TBD	TBD : TBD	0.000	-		-		1.500	Apr 2020	-		1.500	0.000	1.500	-
Strategic Study	TBD	TBD : TBD	0.000	-		-		0.500	Oct 2019	-		0.500	0.000	0.500	-
		Subtotal	0.000	-		-		7.680		-		7.680	0.000	7.680	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Administration	Various	Not specified. : TBD	0.000	-		-		1.500	Feb 2020	-		1.500	0.000	1.500	-
		Subtotal	0.000	-		-		1.500		-		1.500	0.000	1.500	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	-		0.000		9.180		-		9.180	0.000	9.180	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0301112F / *Nuclear Planning and Execution System (NPES)*	**Project (Number/Name)** 674212 / *NLCC Decision Support System*

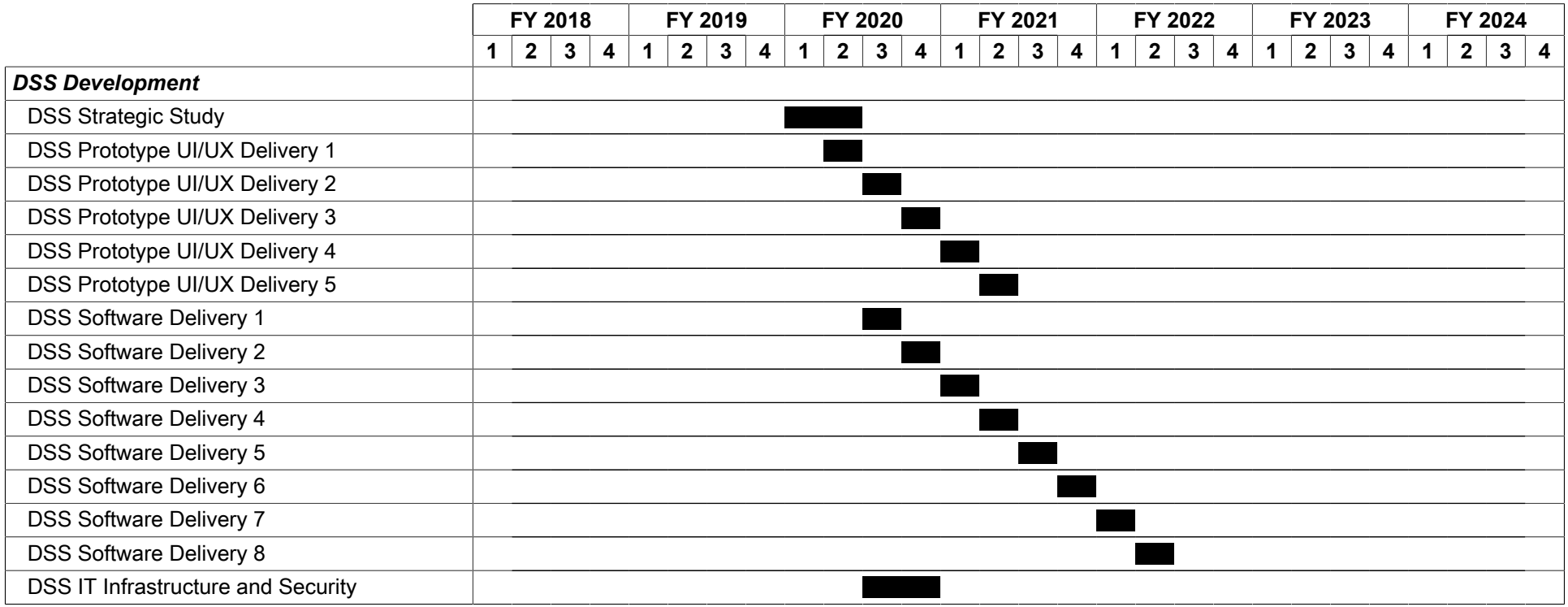


Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0301112F / *Nuclear Planning and Execution System (NPES)*	**Project (Number/Name)** 674212 / *NLCC Decision Support System*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
DSS Development				
DSS Strategic Study	1	2020	2	2020
DSS Prototype UI/UX Delivery 1	2	2020	2	2020
DSS Prototype UI/UX Delivery 2	3	2020	3	2020
DSS Prototype UI/UX Delivery 3	4	2020	4	2020
DSS Prototype UI/UX Delivery 4	1	2021	1	2021
DSS Prototype UI/UX Delivery 5	2	2021	2	2021
DSS Software Delivery 1	3	2020	3	2020
DSS Software Delivery 2	4	2020	4	2020
DSS Software Delivery 3	1	2021	1	2021
DSS Software Delivery 4	2	2021	2	2021
DSS Software Delivery 5	3	2021	3	2021
DSS Software Delivery 6	4	2021	4	2021
DSS Software Delivery 7	1	2022	1	2022
DSS Software Delivery 8	2	2022	2	2022
DSS IT Infrastructure and Security	3	2020	4	2020

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0301401F / *Air Force Space and Cyber Non-Traditional ISR for Battlespace Awareness*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	3.721	6.633	3.575	0.000	3.575	2.908	3.185	3.243	3.301	0.000	26.566
67A051: *Space Superiority - Advanced Intelligence Systems*	-	3.721	6.633	3.575	0.000	3.575	2.908	3.185	3.243	3.301	0.000	26.566
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program, BA 07 PE 0301401F, project 67A051, Cross Domain Tactical OPIR Processing, is a new start.

Air Force Space and Cyber Non-Traditional Intelligence, Surveillance & Reconnaissance (ISR) for Battlespace Awareness PE 0301401F - P-40A
Cross Domain Overhead Persistent Infrared (OPIR): Cross Domain Tactical OPIR Processing delivers a mechanism providing reach-back support for battlespace awareness functions and manages the timely transfer of newly developed tools to operational users.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	3.721	6.633	3.575	0.000	3.575
Current President's Budget	3.721	6.633	3.575	0.000	3.575
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

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0301401F / *Air Force Space and Cyber Non-Traditional ISR for Battlespace Awareness*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Cross Domain OPIR ***Description:*** Develop Cross Domain OPIR that delivers a mechanism to provide reach-back support for battlespace awareness functions and manages the timely transfer of newly developed tools to operational users. specifically by developing tools & tradecraft on a flexible architecture allowing easy integration. ***FY 2019 Plans:*** Continue development of tools & tradecraft on a flexible architecture that allows easy integration of new capabilities into air component operations by providing advanced "state of art" algorithms and tools for the warfighter. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A	2.400	1.350	-
Title: TAC OPIR Processing ***Description:*** Develop tactical OPIR processing comprised of software development, controlled multi-level security interface that provides data access and processing services for a robust and flexible network architecture. ***FY 2019 Plans:*** Develop software for a controlled multi-level security interface. ***FY 2020 Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A	1.321	5.283	3.575
Accomplishments/Planned Programs Subtotals	3.721	6.633	3.575

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

All contracts funded in this program will be awarded using competitive procedures to the maximum extent possible.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0301401F / *Air Force Space and Cyber Non-Traditional ISR for Battlespace Awareness*

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0301401F / *Air Force Space and Cyber Non-Traditional ISR for Battlespace Awareness*	Project (Number/Name) 67A051 / *Space Superiority - Advanced Intelligence Systems*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Cross Domain OPIR	C/CPFF	NASIC : Dayton, OH	-	2.400	May 2018	1.350	May 2019	3.575		-		3.575	Continuing	Continuing	-
Tactical OPIR Processing	C/CPFF	NASIC : Dayton, OH	-	1.321	May 2018	5.283	May 2019	-		-		-	Continuing	Continuing	-
		Subtotal	-	3.721		6.633		3.575		-		3.575	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	3.721		6.633		3.575		-		3.575	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0301401F / *Air Force Space and Cyber Non-Traditional ISR for Battlespace Awareness*	**Project (Number/Name)** 67A051 / *Space Superiority - Advanced Intelligence Systems*

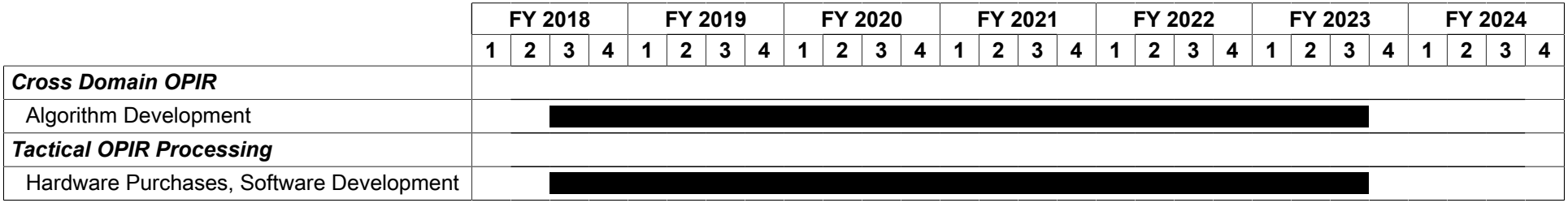


Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0301401F / *Air Force Space and Cyber Non-Traditional ISR for Battlespace Awareness*	**Project (Number/Name)** 67A051 / *Space Superiority - Advanced Intelligence Systems*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Cross Domain OPIR				
Algorithm Development	3	2018	3	2023
Tactical OPIR Processing				
Hardware Purchases, Software Development	3	2018	3	2023

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0302015F / *E-4B National Airborne Operations Center (NAOC)*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	37.481	57.758	70.173	0.000	70.173	3.474	0.000	0.000	0.000	0.000	168.886
674777: *E-4B Aircraft Modernization*	-	37.481	57.758	70.173	0.000	70.173	3.474	0.000	0.000	0.000	0.000	168.886
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

FY18 E-4B Recapitalization efforts are executed under PE0604288F, Project 646507, BA4

A. Mission Description and Budget Item Justification

The four (4) aircraft E-4B National Airborne Operations Center (NAOC) fleet satisfies the military need for an airborne operations center with communications capabilities permitting military and civilian leadership to monitor and control military and civil national assets during all phases of conflict (nuclear and non-nuclear) or natural disaster. The E-4B NAOC fleet also satisfies the military requirement to provide a highly survivable node of the National Military Command System (NMCS).

This program's developmental modifications include, but are not limited to, upgrades and enhancements to aircraft structures, propulsion system, fuel system, environmental control system, electrical generation and distribution systems, flight safety and navigation systems (with their associated communications equipment). Additionally, modifications may enhance the aircraft's operations center facilities, to include but not limited to those necessary for the Senior Leadership Command, Control and Communications System (SL3CS), National Leadership Command Capability (NLCC), Nuclear Command, Control, and Communications (NC3) and other communications necessary for the E-4B fleet to execute its mission. Funds may also be used to explore and develop modifications, upgrades, and future systems required to meet evolving mission requirements. This budget supports the following developmental modifications and studies/projects currently underway or planned for accomplishment:

- The Advanced Extremely High Frequency (AEHF) Compatible Terminal/ Presidential National Voice Conferencing (PNVC) Program integrates AEHF Compatible Command Post Terminals and PNVC capability onto the E-4B NAOC platform. This integration is necessary to replace the legacy Military Strategic, Tactical and Relay (MILSTAR) terminal, and provide access to protected wideband AEHF satellite networks. PNVC replaces the Survivable Emergency Conferencing Network (SECN), which will not be supported once the AEHF satellite network is in place.

- The Low Frequency Transmit System (LFTS) program replaces the currently installed Very Low Frequency/Low Frequency (VLF/LF) Transmit system, which is no longer sustainable after over 35 years of operation. In order to meet existing Presidential Policy Directive (PPD)-35 requirements and ensure there is assured connectivity between civilian and military leadership and military forces during real world situations, this system must be replaced. The transmit system consists of three primary equipment groups: a Control/Monitor group, a Power Amplifier/Coupler (PA/C) group, and a Trailing Wire Antenna (TWA) group.

- The MUOS program upgrades the E-4B's Ultra-High Frequency Radio transmitters to be MUOS capable to meet E-4B Capability Development Document (CDD) and CJCSI 6251_01D requirements. MUOS provides securable data and full duplex voice communications while simultaneously monitoring a second frequency. The

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0302015F / *E-4B National Airborne Operations Center (NAOC)*

MUOS upgrade will provide interoperability with MUOS waveforms for voice and data communications and with other nuclear and national C2 centers and aircraft by replacing the legacy USC-42 UHF SATCOM radios with a MUOS capable radio.

- Survivable SHF will upgrade and replace portions of the E-4B's SHF system to meet existing Presidential Policy Directive (PPD)-35 and National Security Presidential Directive (NSPD)-51/Homeland Security Presidential Directive (HSPD)-20 requirements and to ensure continued connectivity and interoperability as satellite and communications infrastructure evolves. Expected modifications include, but are not limited to, component and sub-system upgrades and replacement of portions of the current SHF system that are obsolete or near end of service life. A replacement to the SHF system is required as secure, survivable communications capability transitions from the Defense Satellite Communications System (DSCS).

This program element may include necessary civilian pay expenses required to manage, execute, and deliver E-4B weapon system capability; furthermore, it may include support funding for emerging modification requirements to support PMA, A&AS, equipment and other government cost.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver E-4B weapon system capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	35.467	57.758	70.173	0.000	70.173
Current President's Budget	37.481	57.758	70.173	0.000	70.173
Total Adjustments	2.014	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	3.299	0.000			
• SBIR/STTR Transfer	-1.285	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0302015F / *E-4B National Airborne Operations Center (NAOC)*

Change Summary Explanation

FY18 was increased by $3.299M for AEHF through a Below Threshold Reprogramming (BTR) Action. The FY18 funding was reduced by $1.285M due to Small Business Innovation Research Transfer (SBIR)

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Advanced Extremely High Frequency (AEHF) Compatible Terminal/Presidential National Voice Capability (PNVC) ***Description:*** Integrate AEHF Compatible Terminal/PNVC capability onto the E-4B NAOC platform to replace the existing MILSTAR/SECN system. ***FY 2019 Plans:*** Install first prototype kit and conduct remaining activities leading up to the installation of the second prototype kit. Milestone C anticipated by 4QFY19. ***FY 2020 Plans:*** Install second prototype kit and conduct remaining activities leading up to the installation of the first production kit. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding decreases from FY19 to FY20 with development coming to an end and procurement starting.	18.737	24.745	15.087
Title: E-4B Low Frequency Transmit System (LFTS) ***Description:*** Replaces the E-4B's legacy Very Low Frequency/Low Frequency (VLF/LF) Transmit System, which is over 35 years old and is past its useful life. This capability is required to comply with Presidential Policy Directive (PPD)-35 to ensure there is assured connectivity between civilian and military leadership and military forces during all stages of conflict and/or national emergencies. ***FY 2019 Plans:*** Complete ground and flight test activities on first prototype install at Offutt AFB after Programmed Depot Maintenance (PDM) completion. ***FY 2020 Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Development activities end in FY19 as program moves into production.	18.744	25.167	0.000
Title: E-4B Mobile User Objective System (MUOS) ***Description:*** The MUOS program upgrades E-4B Ultra-High Frequency Radio transmitters to be MUOS capable to meet the E-4B CDD and CJCSI 6251_01D. MUOS provides securable data and full duplex voice communications while simultaneously	0.000	5.757	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0302015F / *E-4B National Airborne Operations Center (NAOC)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
monitoring a second frequency. The MUOS upgrade will provide interoperability with MUOS waveforms for voice and data communications and with other nuclear and national C2 centers and aircraft by replacing the legacy USC-42 UHF SATCOM radio system. ***FY 2019 Plans:*** Prepare for Acquisition Strategy decision and Milestone B document development. Develop initial kit, integrate and test MUOS system on one E-4B. ***FY 2020 Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** All development activities funded with FY19 RDT&E.			
Title: Survivable SHF ***Description:*** SHF Modernization will upgrade and replace portions of the E-4B's SHF system to meet existing Presidential Policy Directive (PPD)-35 and National Security Presidential Directive (NSPD)-51/Homeland Security Presidential Directive (HSPD)-20 requirements and to ensure continued connectivity and interoperability as satellite and communications infrastructure evolves. ***FY 2019 Plans:*** Perform obsolesce, reliability, and maintainability study to determine scope of modification. ***FY 2020 Plans:*** Conduct design, integration, and prototype development activities. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding increases from FY19 to FY20 with majority of development activities occurring in FY20.	0.000	2.089	55.086
Accomplishments/Planned Programs Subtotals	37.481	57.758	70.173

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• RDTE 04 PE0604288F BA04: *National Airborne Operations Center (NAOC) Recap*	6.141	7.440	16.669	-	16.669	102.739	136.684	138.000	141.000	0.000	548.673

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0302015F / *E-4B National Airborne Operations Center (NAOC)*

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APAF 05 Line Item E00400: *E-4B Nat Airborne Ops Center (NAOC)*	25.914	67.858	58.477	-	58.477	73.905	52.293	38.868	41.213	0.000	358.528
• APAF 06 Line Item 000999: *Initial Spares/Repair Parts*	0.972	1.061	0.332	-	0.332	0.339	0.346	0.352	0.358	0.000	3.760

Remarks

E. Acquisition Strategy

Acquisition Strategy: The acquisition strategy for each specific modification differs based on the urgency of the requirement, definition of the capability, and technology readiness level of the components.

Management Strategy: Program management for all aircraft modifications is executed by the Commercial Derivative Aircraft Division at Tinker AFB. The Program Executive Officer (PEO) for Presidential and Executive Airlift provides management oversight.

Contracting Strategy: Contracting strategy differs for each individual modification, but normally includes an initial engineering study contract followed by a development contract. Production installations and sustainment are typically accomplished with the E-4B Contractor Logistics Support (CLS) contract.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0302015F / *E-4B National Airborne Operations Center (NAOC)*	**Project (Number/Name)** 674777 / *E-4B Aircraft Modernization*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AEHF/PNVC Integration	C/CPFF	Raytheon : Largo, FL	-	18.737	Mar 2018	24.745	Jul 2019	15.087	Oct 2019	-		15.087	0.000	58.569	44.471
LFTS Development	SS/CPIF	Boeing : OKC, OK	-	18.744	Nov 2017	25.167	Jun 2019	-		-		-	0.000	43.911	103.857
MUOS	TBD	Raytheon : Largo, FL	-	-		5.757	Jun 2019	-		-		-	0.000	5.757	-
Survivable SHF	TBD	L-3 : SLC, UT	-	-		2.089	Jun 2019	55.086	Dec 2019	-		55.086	0.000	57.175	-
		Subtotal	-	37.481		57.758		70.173		-		70.173	0.000	165.412	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	37.481		57.758		70.173		-		70.173	0.000	165.412	N/A

Remarks

FY18, FY19, & FY20 AEHF funding incrementally funds AEHF EMD and prototype integration efforts under DMEA contract.

FY18 & FY19 LFTS funding supports integration and test of prototype LFTS system under Boeing's ESS contract.

FY19 MUOS funding supports integration and test of prototype MUOS system under Raytheon IDIQ contract.

FY19 & FY20 SSHF funding supports development, integration, and test of prototype SSHF system under L-3 IDIQ contract.

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0302015F / *E-4B National Airborne Operations Center (NAOC)*	**Project (Number/Name)** 674777 / *E-4B Aircraft Modernization*

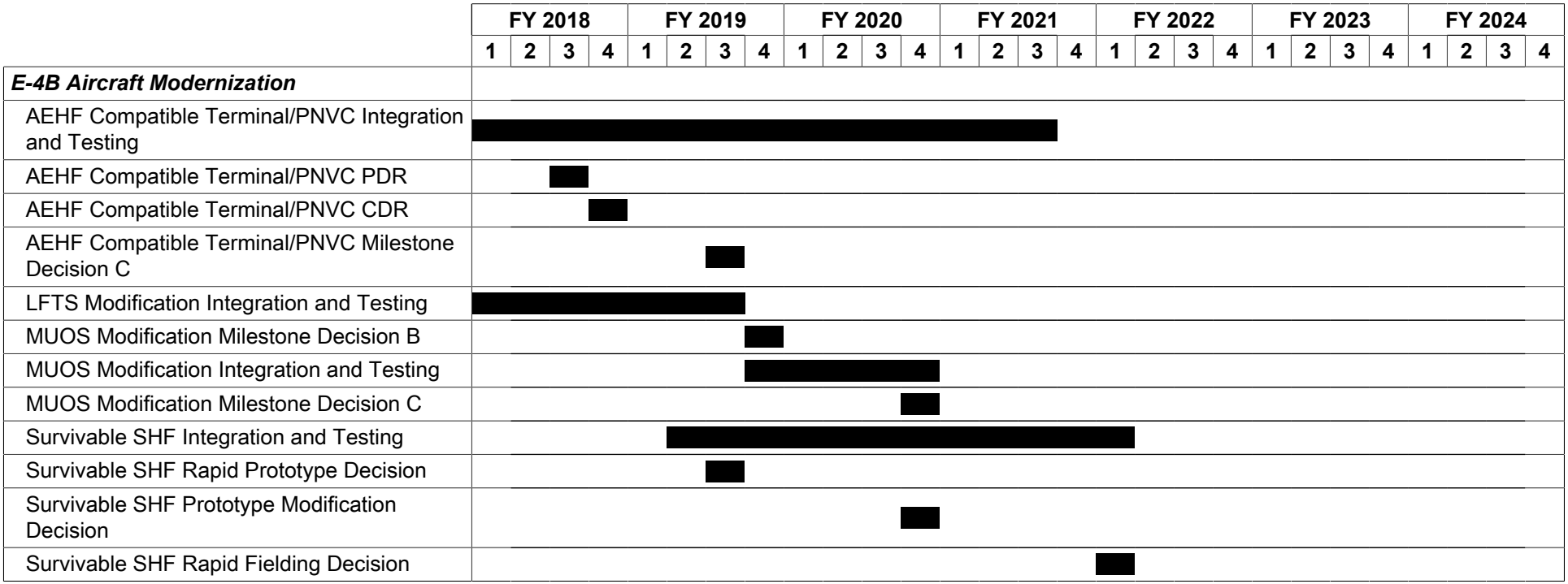


Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0302015F / *E-4B National Airborne Operations Center (NAOC)*	**Project (Number/Name)** 674777 / *E-4B Aircraft Modernization*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
E-4B Aircraft Modernization				
AEHF Compatible Terminal/PNVC Integration and Testing	1	2018	3	2021
AEHF Compatible Terminal/PNVC PDR	3	2018	3	2018
AEHF Compatible Terminal/PNVC CDR	4	2018	4	2018
AEHF Compatible Terminal/PNVC Milestone Decision C	3	2019	3	2019
LFTS Modification Integration and Testing	1	2018	3	2019
MUOS Modification Milestone Decision B	4	2019	4	2019
MUOS Modification Integration and Testing	4	2019	4	2020
MUOS Modification Milestone Decision C	4	2020	4	2020
Survivable SHF Integration and Testing	2	2019	1	2022
Survivable SHF Rapid Prototype Decision	3	2019	3	2019
Survivable SHF Prototype Modification Decision	4	2020	4	2020
Survivable SHF Rapid Fielding Decision	1	2022	1	2022

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0303131F / *Minimum Essential Emergency Communications Network (MEECN)*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	34.466	64.543	13.543	0.000	13.543	91.814	58.666	14.443	7.024	Continuing	Continuing
672832: *MEECN System Improvements*	-	3.485	25.942	0.948	0.000	0.948	0.966	0.987	1.005	1.024	Continuing	Continuing
672835: *Common VLF/LF Receiver Inc 2*	-	12.916	9.559	12.478	0.000	12.478	82.499	57.663	13.428	6.000	Continuing	Continuing
676029: *Global Aircrew Strategic Network Terminal*	-	7.376	14.692	0.000	0.000	0.000	0.001	0.000	0.000	0.000	Continuing	Continuing
676030: *Global ASNT Inc 2*	-	10.689	14.350	0.117	0.000	0.117	8.348	0.016	0.010	0.000	Continuing	Continuing

Note

Nuclear Command, Control, and Communications (NC3) Dem/Val will continue to execute funds from the MEECN System Improvements (MSI) Program 0303131F, Project 672832.

A. Mission Description and Budget Item Justification

Nuclear Deterrence Operations (NDO) is an Air Force Core Function. Within this core function, Nuclear Command and Control (NC2) is the exercise of authority and direction by the President, as Commander in Chief, through established command lines, over nuclear weapon operations of military forces. The President's authority and direction are exercised through the Nuclear Command and Control System (NCCS). The NCCS is the designated combination of flexible and enduring elements including facilities, equipment, communications, procedures, personnel, and the structure in which these elements are integrated, all of which are essential for planning, directing, and controlling nuclear weapon operations.

The MEECN portfolio modernizes the systems necessary to effectively provide assured communications connectivity between the President and the strategic deterrence forces in stressed environments.

MSI is a long-range planning process with users (Air Force Global Strike Command (AFGSC), Air Combat Command (ACC), Air Force Space Command (AFSPC), Air Mobility Command (AMC), Air Force Special Operations Command (AFSOC), US Strategic Command (USSTRATCOM), and the Navy) to monitor and assess the performance of NC3 systems and develop recommendations for current and future strategic and tactical architectures, requirements, and issues based on available and emerging technologies. MSI is used to conduct technology testing; analyze technology strategies; conduct requirement trade space analysis, technology maturation and risk reduction efforts, and mission analysis; and build technology Roadmaps as proactive support to the NC3 community. MSI performs analysis, integration, and testing activities for the NC3 Weapon System.

NC3 Dem/Val is required for advanced concept development and prototyping of next generation NC3 systems. This program ensures a responsive design and development engineering infrastructure to address evolving Nuclear Deterrence Operations mission requirements, emerging issues and technology insertion/technology

application on the NC3 Weapon System, future strategic systems/capability, and other common strategic areas where appropriate, and develop enhanced multi-use capabilities. The NC3 Dem/Val Program will provide technology maturation and risk reduction activities to support the NC3 Weapon System (AN/USQ-225). Activity will reduce life cycle costs, inform technology maturation & risk reduction efforts, improve system performance, mitigate evolving threats, and ensure both viability and durability of the NC3 Weapon System.

Common Very Low Frequency/Low Frequency (VLF/LF) Receiver (CVR) Increment 2 (CVR Inc. 2) will deliver a survivable, beyond-line-of-sight path for Emergency Action Message (EAM) reception. The intent of CVR Inc. 2 is to replace inadequate, unsustainable strategic communications equipment by developing and producing a common VLF/LF receiver, capable of implementing an interoperable waveform, to integrate into current and future airborne and ground based platforms, improve system performance, and reduce supportability costs through commonality. The program will also lead the development of the Uniform MEECN Mode (UMM) waveform expected to be used by the United States Air Force and Navy.

Global Aircrew Strategic Network Terminal (Global ASNT) replaces inadequate, unsustainable strategic communications equipment at bomber, tanker and reconnaissance Wing Command Posts (WCPs), Nuclear Task Forces and Munitions Support Squadrons (MUNSS) and for Mobile Support Teams (MSTs). Global ASNT is a ground-based system that will provide survivable, secure communication paths to receive Emergency Action Messages (EAMs), Force Management messages, and Force Direction messages and disseminate them to bomber, tanker, and reconnaissance aircrews.

Global ASNT is being fielded in separate capability increments. Global ASNT Increment 1 (Inc. 1) includes early system engineering support for the planning and development for the future Global ASNT Increments.

Global ASNT Inc. 1 fields required Extremely High Frequency/Advanced Extremely High Frequency (EHF/AEHF) capabilities and replaces inadequate, unsustainable strategic mobile and fixed-site Single Channel Anti-jam Man-Portable (SCAMP) terminals and Secure, Mobile, Anti-Jam, Reliable, Tactical - Terminal (SMART-T) equipment.

Global ASNT Increment 2 delivers a replacement Aircrew Alerting System (AAS) consisting of personal and general alerting equipment, and High Frequency (HF) and Ultra High Frequency (UHF) capabilities. Increment 2 replaces inadequate, unsustainable Electromagnetic Pulse Hardened Dispersal Communication (EHDC) systems and Aircrew Alerting Communications Electromagnetic Pulse (AACE) systems.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver nuclear weapon support capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0303131F / *Minimum Essential Emergency Communications Network (MEECN)*

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	48.841	99.088	65.839	0.000	65.839
Current President's Budget	34.466	64.543	13.543	0.000	13.543
Total Adjustments	-14.375	-34.545	-52.296	0.000	-52.296
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	-12.200	-32.000			
• 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	-0.402	0.000			
• Other Adjustments	-1.773	-2.545	-52.296	0.000	-52.296

Change Summary Explanation

FY 2018 PB CVRi2/ASNTi2 Congressional mark (-$12.2M)
FY 2018 PB CVRi2 decrease FFRDC reduction (-$1.773M)
FY 2018 PB SBIR reduction (-$0.402)
FY 2019 PB Congressional mark (-$-32.0M)
FY 2019 PB FFRDC reduction (-$2.545M)
FY 2020 PB CVRi2 re-phase to FY22/23(-$12.0M)
FY 2020 PB CVRi2 under-execution(-$5.205M)
FY 2020 PB Global ASNTi2 decrease (-$35.091M)

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0303131F / *Minimum Essential Emergency Communications Network (MEECN)*	Project (Number/Name) 672832 / *MEECN System Improvements*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
672832: *MEECN System Improvements*	-	3.485	25.942	0.948	0.000	0.948	0.966	0.987	1.005	1.024	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Nuclear Command, Control, and Communications (NC3) Dem/Val, is an FY19 new start ($25.012M), to be executed in the MEECN System Improvements (MSI) line Program 0303131F, Project 672832. NC3 Dem/Val efforts will be continued in the MSI line in FY20 and beyond.

A. Mission Description and Budget Item Justification

MEECN System Improvement (MSI) is a long-range planning process with users (Air Force Global Strike Command (AFGSC), Air Combat Command (ACC), Air Force Space Command (AFSPC), Air Mobility Command (AMC), Air Force Special Operations Command (AFSOC), US Strategic Command (USSTRATCOM), and the Navy) to monitor and assess the performance of NC3 systems and develop recommendations for current and future strategic and tactical architectures, requirements, and issues based on available and emerging technologies. MSI is used to conduct technology testing; analyze technology strategies; conduct requirement trade space analysis, technology maturation and risk reduction efforts, and mission analysis; and build technology roadmaps as proactive support to the NC3 enterprise. MSI performs analysis, integration, and testing activities for the NC3 Weapon System.

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

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: MEECN System Improvements	3.485	25.942	0.948
Description: Conduct NC3 technology testing, NC3 Weapon System integration, build comprehensive technology strategies and roadmaps. Conduct VLF/LF tradeoff analysis. Deliver results of analytic tasks in an annual NC3 report. NC3 Dem/Val activities will include but not limited to; conducting studies, analysis, and software/hardware prototyping; test bed activities; exercise participation; developing modeling and simulation of identified NC3 WS architecture; integrated NC3 WS testing, validation, and certification; and direct mission support contracts in support of next generation NC3 systems and sub-			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303131F / *Minimum Essential Emergency Communications Network (MEECN)*	**Project (Number/Name)** 672832 / *MEECN System Improvements*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
systems. NC3 Dem/Val ensures a responsive design and development engineering infrastructure to address evolving Nuclear Deterrence Operations. ***FY 2019 Plans:*** Continue to refresh NC3 Architecture Roadmap Complete NC3 Annual Report - FY19 Conduct design and development engineering Perform analysis of engineering issues and technology insertion Develop enhanced multiuse capabilities Conduct technology maturation and risk reduction activities Evaluate integrated technology, representative modes, and prototype systems Conduct technology testing; analyze technology strategies Build technology roadmaps as proactive support Perform analysis, integration, and testing activities Conduct NC3 Connectivity Performances updates Develop messaging, waveform, mode, and system standards Develop proof-of-concepts and prototypes for prediction-based system functionality, sensor systems, transmission modes and algorithms for traffic routing Develop weapon system validation test environment including but not limited to the purchase of vendor radios and terminals and test equipment Conduct studies, analysis, proof-of-concept, and prototyping for the assessment and modernization of the AF NC3 WS (AN/USQ-225) ***FY 2020 Plans:*** Continue to refresh NC3 Architecture Roadmap Continue planning and initiate integration, analysis, and testing activities for AF NC3 WS Complete NC3 Annual Report - FY20 Conduct design and development engineering Perform analysis of engineering issues and technology insertion Develop enhanced multiuse capabilities Conduct technology maturation and risk reduction activities Evaluate integrated technology, representative modes, and prototype systems Conduct technology testing; analyze technology strategies			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303131F / *Minimum Essential Emergency Communications Network (MEECN)*	**Project (Number/Name)** 672832 / *MEECN System Improvements*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Build technology roadmaps as proactive support Perform analysis, integration, and testing activities Conduct NC3 Connectivity Performances updates Develop messaging, waveform, mode, and system standards Develop proof-of-concepts and prototypes for prediction-based system functionality, sensor systems, transmission modes and algorithms for traffic routing Develop weapon system validation test environment including but not limited to the purchase of vendor radios and terminals and test equipment Conduct studies, analysis, proof-of-concept, and prototyping for the assessment and modernization of the AF NC3 WS (AN/USQ-225) ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding decrease due to reduced NC3 DEM/VAL program in FY 2020.			
Accomplishments/Planned Programs Subtotals	3.485	25.942	0.948

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

MSI will continue to evaluate the performance of the NC3 Weapon System, by assessing performance and technology areas for improvement with the assistance of expert technical support from FFRDCs, UARCs, and may include competitively awarded technical support contracts with industry. Johns Hopkins University/Applied Physics Laboratory will support NC3 Weapon System Architecture Roadmap updates.

To conduct NC3 Dem/Val essential activities a combination of competitively awarded contracts, as well as sole source contracts, may be used to augment AF organic capabilities with technical skill sets from FFRDCs, UARCs, and industry Advisory and Assistance Services (A&AS) providers.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303131F / *Minimum Essential Emergency Communications Network (MEECN)*	**Project (Number/Name)** 672832 / *MEECN System Improvements*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MSI NC3 Roadmap / NC3 Connectivity Performances Update	MIPR	JHU APL : Laurel, MD	-	0.000		0.792	Mar 2019	0.800	Mar 2020	-		0.800	Continuing	Continuing	-
NC3 Integration DMS FFRDC/UARC/A&AS	Various	Various : Various	-	3.422	Sep 2018	-		-		-		-	Continuing	Continuing	-
NC3 Dem/Val	TBD	Various : Various	-	-		12.035	Feb 2019	-		-		-	Continuing	Continuing	-
NC3 Dem/Val DMS FFRDC/UARC/A&AS	TBD	Various : Various	-	-		8.317	Dec 2018	-		-		-	Continuing	Continuing	-
Global Assured Comm	MIPR	Various : Various	-	-		-		-		-		-	Continuing	Continuing	-
		Subtotal	-	3.422		21.144		0.800		-		0.800	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NC3 Dem/Val Test	Various	Various : Various	-	-		4.660	Feb 2019	-		-		-	Continuing	Continuing	-
		Subtotal	-	-		4.660		-		-		-	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MSI PSC (Eng/Acq Spt/ Travel/IMPAC)	Various	Various : Various	-	0.063	Mar 2018	0.138	Feb 2019	0.148	Nov 2019	-		0.148	Continuing	Continuing	-
		Subtotal	-	0.063		0.138		0.148		-		0.148	Continuing	Continuing	N/A

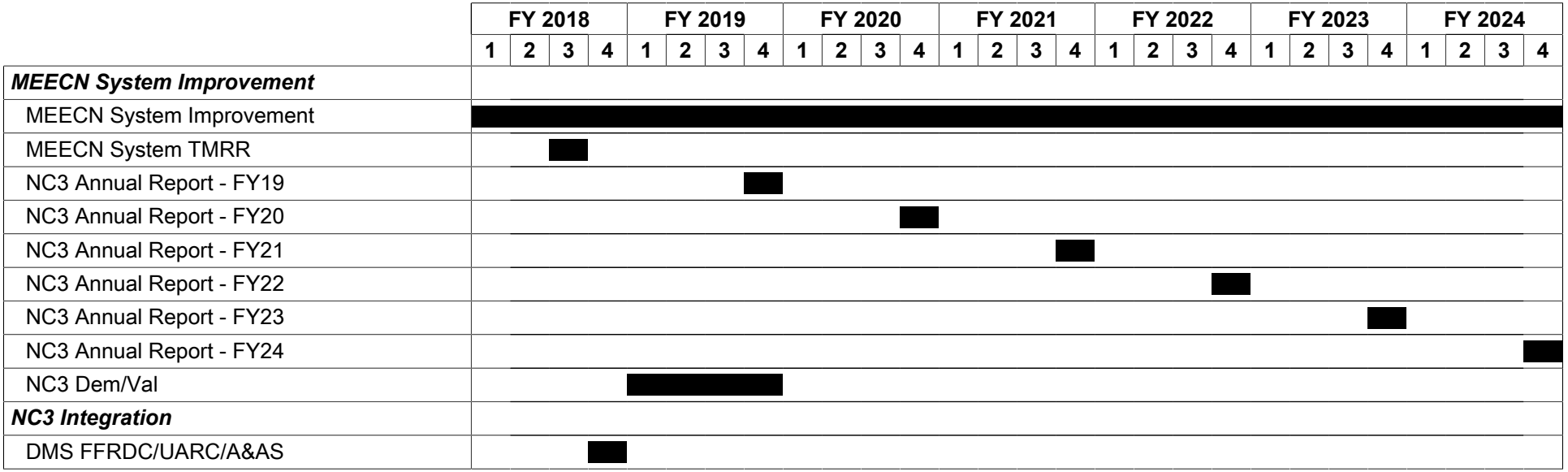
	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	3.485		25.942		0.948		-		0.948	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0303131F / *Minimum Essential Emergency Communications Network (MEECN)*	Project (Number/Name) 672832 / *MEECN System Improvements*	

	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303131F / *Minimum Essential Emergency Communications Network (MEECN)*	**Project (Number/Name)** 672832 / *MEECN System Improvements*



MEECN System Improvement

NC3 Integration

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303131F / *Minimum Essential Emergency Communications Network (MEECN)*	**Project (Number/Name)** 672832 / *MEECN System Improvements*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
MEECN System Improvement				
MEECN System Improvement	1	2018	4	2024
MEECN System TMRR	3	2018	3	2018
NC3 Annual Report - FY19	4	2019	4	2019
NC3 Annual Report - FY20	4	2020	4	2020
NC3 Annual Report - FY21	4	2021	4	2021
NC3 Annual Report - FY22	4	2022	4	2022
NC3 Annual Report - FY23	4	2023	4	2023
NC3 Annual Report - FY24	4	2024	4	2024
NC3 Dem/Val	1	2019	4	2019
NC3 Integration				
DMS FFRDC/UARC/A&AS	4	2018	4	2018

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0303131F / *Minimum Essential Emergency Communications Network (MEECN)*	Project (Number/Name) 672835 / *Common VLF/LF Receiver Inc 2*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
672835: *Common VLF/LF Receiver Inc 2*	-	12.916	9.559	12.478	0.000	12.478	82.499	57.663	13.428	6.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Common Very Low Frequency/Low Frequency (VLF/LF) Receiver (CVR) Increment 2 (CVR Inc. 2) will deliver a survivable, beyond-line-of-sight path for Emergency Action Message (EAM) reception. The intent of CVR Inc. 2 is to replace inadequate, unsustainable strategic communications equipment by developing and producing a common VLF/LF receiver, capable of implementing an interoperable waveform, to integrate into current and future airborne and ground based platforms, improve system performance, and reduce supportability costs through commonality. The program will also lead the development of the Uniform MEECN Mode (UMM) waveform expected to be used by the United States Air Force and Navy.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: CVR Inc 2	12.916	9.559	12.478
Description: Pre-Milestone B Activities			
FY 2019 Plans: Continue pre-development and upfront system engineering activities Continue requirements and technology analysis and market research Approved for Direct Cite Authority hires Continue inspection/modification of Waveguide Integrated Series of Programs (WISP) model Continue VLF/LF antenna characterization performance assessment Continue Validated Online Lifecycle Threat (VOLT) Assessment Continue VLF/LF and UMM Working Groups Develop UMM Waveform Reference Architecture Continue work on UMM VLF/LF Waveform Standard Develop Modeling and Simulation on UMM VLF/LF Waveform Standard Complete Material Development Decision (MDD) and obtain Acquisition Decision Memorandum (ADM) Complete Broad Agency Announcement (BAA) Draft system requirements documentation and validate requirements Conduct Platform Interface Assessments			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303131F / *Minimum Essential Emergency Communications Network (MEECN)*	**Project (Number/Name)** 672835 / *Common VLF/LF Receiver Inc 2*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Develop acquisition strategy, requirements trades, mission analysis, and Government reference architecture in preparation for Milestone B Continue to develop RFP and Milestone B documentation ***FY 2020 Plans:*** Continue VLF/LF antenna characterization performance assessment Continue VLF/LF and UMM Working Groups Continue work on UMM VLF/LF Waveform Standard Conduct Competitive Source Selection Approved for Direct Cite Authority hires TMRR Prototype RFP Release/Contract Award Continue to develop acquisition strategy, requirements trades, mission analysis, and Government reference architecture in preparation for Milestone B Continue to develop RFP and Milestone B documentation RFP Release ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding addresses increasing preparation activities for Milestone B and EMD contract award.			
Accomplishments/Planned Programs Subtotals	12.916	9.559	12.478

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APAF 03 PE 0303131F: *CVR Inc 2*	-	-	-	-	-	-	6.378	49.202	66.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

CVR Inc 2 intends to use a full and open competitive source selection to award TMRR Prototype followed by EMD contract. Program may leverage the 2010 NDAA Section 804 authority to accelerate acquisition schedule and procurement activities.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303131F / *Minimum Essential Emergency Communications Network (MEECN)*	**Project (Number/Name)** 672835 / *Common VLF/LF Receiver Inc 2*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Early Development (TMRR prototype contract FY 2020)	Various	Various : TBD	-	3.151	May 2018	1.418	Mar 2019	3.770	Jan 2020	-		3.770	Continuing	Continuing	-
DMS (MITRE)	Various	Various : TBD	-	1.020	May 2018	1.195	Jan 2019	0.000		-		0.000	Continuing	Continuing	-
Broad Agency Announcement	Various	Various : TBD	-	5.363	May 2018	0.000		-		-		-	Continuing	Continuing	-
DMS (Lincoln Lab)	Various	Various : TBD	-	0.210	Jul 2018	1.279	Mar 2019	0.000		-		0.000	Continuing	Continuing	-
Test	Various	Various : TBD	-	-		-		-		-		-	Continuing	Continuing	-
NSA	MIPR	NSA : TBD	-	-		-		-		-		-	Continuing	Continuing	-
		Subtotal	-	9.744		3.892		3.770		-		3.770	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GFE	Various	Various : TBD	-	-		-		-		-		-	Continuing	Continuing	-
		Subtotal	-	-		-		-		-		-	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PSC (Eng/Acq Spt/Travel/ IMPAC)	Various	Various : TBD	-	1.905	Oct 2017	4.049	Nov 2018	5.162	Nov 2019	-		5.162	Continuing	Continuing	-
PSC - MITRE	Various	Various : TBD	-	1.267	Dec 2017	1.618	Feb 2019	3.546	Oct 2019	-		3.546	Continuing	Continuing	-
		Subtotal	-	3.172		5.667		8.708		-		8.708	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0303131F / *Minimum Essential Emergency Communications Network (MEECN)*	Project (Number/Name) 672835 / *Common VLF/LF Receiver Inc 2*	

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	12.916		9.559		12.478		-		12.478	Continuing	Continuing	N/A

Remarks

In FY19,CVR Inc 2 will expend $0.809M on manpower positions hired under Direct Cite Authority.
In FY20,CVR Inc 2 will expend $2.200M on manpower positions hired under Direct Cite Authority.

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303131F / *Minimum Essential Emergency Communications Network (MEECN)*	**Project (Number/Name)** 672835 / *Common VLF/LF Receiver Inc 2*

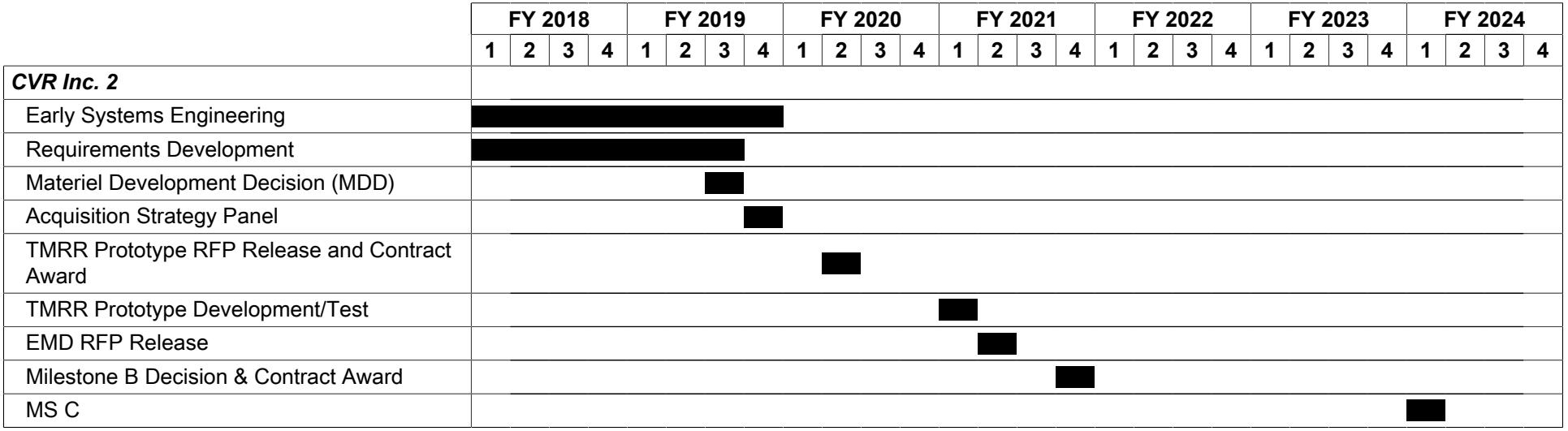


Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303131F / *Minimum Essential Emergency Communications Network (MEECN)*	**Project (Number/Name)** 672835 / *Common VLF/LF Receiver Inc 2*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
CVR Inc. 2				
Early Systems Engineering	1	2018	4	2019
Requirements Development	1	2018	3	2019
Materiel Development Decision (MDD)	3	2019	3	2019
Acquisition Strategy Panel	4	2019	4	2019
TMRR Prototype RFP Release and Contract Award	2	2020	2	2020
TMRR Prototype Development/Test	1	2021	1	2021
EMD RFP Release	2	2021	2	2021
Milestone B Decision & Contract Award	4	2021	4	2021
MS C	1	2024	1	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0303131F / *Minimum Essential Emergency Communications Network (MEECN)*	Project (Number/Name) 676029 / *Global Aircrew Strategic Network Terminal*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
676029: *Global Aircrew Strategic Network Terminal*	-	7.376	14.692	0.000	0.000	0.000	0.001	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Global ASNT replaces inadequate, unsustainable strategic communications equipment at bomber, tanker and reconnaissance Wing Command Posts (WCPs), Nuclear Task Forces and Munitions Support Squadrons (MUNSS) and for Mobile Support Teams (MSTs). Global ASNT is a ground-based system that will provide survivable, secure communication paths to receive Emergency Action Messages (EAMs), Force Management messages, and Force Direction messages and disseminate them to bomber, tanker, and reconnaissance aircrews.

Global ASNT is being fielded in separate capability increments. Global ASNT Increment 1 (Inc 1) includes early system engineering support for the planning and development for the future Global ASNT Increments.

Global ASNT Inc 1 fields required Extremely High Frequency/Advanced Extremely High Frequency (EHF/AEHF) capabilities and replaces inadequate, unsustainable strategic mobile and fixed-site Single Channel Anti-jam Man-Portable (SCAMP) terminals and Secure, Mobile, Anti-Jam, Reliable, Tactical - Terminal (SMART-T) equipment.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Global ASNT Inc 1	7.376	14.692	0.000
Description: Engineering & Manufacturing Development (EMD)			
FY 2019 Plans: Complete Operational Testing (OT) in preparation for Milestone C. Resolve any Deficiency Reports (DRs) identified in DT/OT testing. Resolve any outstanding Deficiency Reports (DRs) identified in integration and test of system level hardware and software. Complete satellite network simulations and associate MITRE lab analytic activities through DMS/PSC. Complete Milestone C documentation and Engineering Change Orders (ECOs). Achieve Milestone C production decision.			
FY 2020 Plans: No Activity			
FY 2019 to FY 2020 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303131F / *Minimum Essential Emergency Communications Network (MEECN)*	**Project (Number/Name)** 676029 / *Global Aircrew Strategic Network Terminal*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Transition to production phase of acquisition lifecycle using procurement funds.			
Accomplishments/Planned Programs Subtotals	7.376	14.692	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPAF 03 PE 0303131F: *Global ASNT Inc. 1 (834210)*	0.292	140.875	132.648	-	132.648	41.412	51.913	40.691	47.619	Continuing	Continuing
• OPAF 05 PE 0303131F: *Global ASNT Inc. 1 (861900*	0.000	73.470	68.795	-	68.795	0.000	0.000	0.000	0.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

Global ASNT used a full and open competitive approach to award an EMD contract for Increment 1. Global ASNT will continue to use a competitive incremental approach to fulfill the overall requirements for Increments 2 and 3.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303131F / *Minimum Essential Emergency Communications Network (MEECN)*	**Project (Number/Name)** 676029 / *Global Aircrew Strategic Network Terminal*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Global ASNT Inc 1 - Engineering & Manufacturing Development	C/FPIF	Raytheon : Marlborough, MA	-	2.920	Feb 2018	10.955	Oct 2018	-		-		-	Continuing	Continuing	-
Global ASNT Inc 1 - Satellite Simulations	SS/FFP	MIT/Lincoln Laboratory : Lexington, MA	-	-		1.143	Mar 2019	-		-		-	Continuing	Continuing	-
		Subtotal	-	2.920		12.098		-		-		-	Continuing	Continuing	N/A

Remarks

- Raytheon Global ASNT Inc 1 EMD contract is an incrementally funded continuing effort on the existing contract.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Global ASNT Inc 1 - MITRE Lab	SS/CPFF	MITRE : Bedford, MA	-	0.380	Oct 2018	-		-		-		-	Continuing	Continuing	-
Global ASNT Inc 1 - Software Support	Various	Various : NV	-	-		0.371	Mar 2019	-		-		-	Continuing	Continuing	-
Global ASNT Inc 1 - GFE	Various	Various : NV	-	-		-		-		-		-	Continuing	Continuing	-
		Subtotal	-	0.380		0.371		-		-		-	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Global ASNT Inc 1 - Government Test and Evaluation	Various	Various : NV	-	0.830	Apr 2018	0.540	Dec 2018	-		-		-	Continuing	Continuing	-
Global ASNT Inc 1 - NSA	MIPR	NSA, Maryland : NV	-	0.011	Feb 2018	0.007	Apr 2019	-		-		-	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303131F / *Minimum Essential Emergency Communications Network (MEECN)*	**Project (Number/Name)** 676029 / *Global Aircrew Strategic Network Terminal*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	0.841		0.547		-		-		-	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Global ASNT Inc 1 - PSC (Eng/Acq Support, Travel)	Various	Various : NV	-	1.163	Feb 2018	1.676	Oct 2018	-		-		-	Continuing	Continuing	-
Global ASNT Inc 1 - PSC (MITRE)	SS/CPFF	MITRE : Bedford, MA	-	2.072	Oct 2018	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	3.235		1.676		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	7.376		14.692		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303131F / *Minimum Essential Emergency Communications Network (MEECN)*	**Project (Number/Name)** 676029 / *Global Aircrew Strategic Network Terminal*

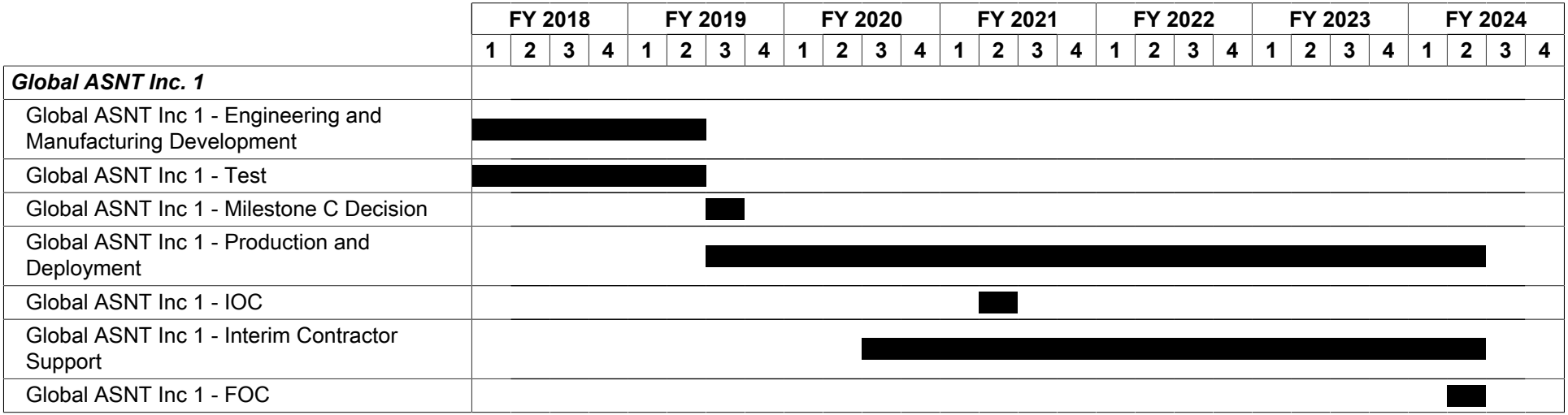


Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303131F / *Minimum Essential Emergency Communications Network (MEECN)*	**Project (Number/Name)** 676029 / *Global Aircrew Strategic Network Terminal*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Global ASNT Inc. 1				
Global ASNT Inc 1 - Engineering and Manufacturing Development	1	2018	2	2019
Global ASNT Inc 1 - Test	1	2018	2	2019
Global ASNT Inc 1 - Milestone C Decision	3	2019	3	2019
Global ASNT Inc 1 - Production and Deployment	3	2019	2	2024
Global ASNT Inc 1 - IOC	2	2021	2	2021
Global ASNT Inc 1 - Interim Contractor Support	3	2020	2	2024
Global ASNT Inc 1 - FOC	2	2024	2	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0303131F / *Minimum Essential Emergency Communications Network (MEECN)*	Project (Number/Name) 676030 / *Global ASNT Inc 2*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
676030: *Global ASNT Inc 2*	-	10.689	14.350	0.117	0.000	0.117	8.348	0.016	0.010	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Global ASNT replaces inadequate, unsustainable strategic communications equipment at bomber, tanker and reconnaissance Wing Command Posts (WCPs), Nuclear Task Forces, Munitions Support Squadrons (MUNSS), and for Mobile Support Teams (MSTs). Global ASNT is a ground-based system that will provide survivable, secure communication paths to receive Emergency Action Messages (EAMs), Force Management messages, and Force Direction messages and disseminate them to bomber, tanker, and reconnaissance aircrews.

Global ASNT is being fielded in separate capability increments.

Global ASNT Increment 2 delivers a replacement Aircrew Alerting System (AAS) consisting of personal and general alerting equipment, Ultra High Frequency (UHF) and High Frequency (HF) capabilities. Increment 2 replaces inadequate, unsustainable Electromagnetic Pulse Hardened Dispersal Communication (EHDC) systems and Aircrew Alerting Communications Electromagnetic Pulse (AACE) systems.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Global ASNT Inc 2	10.689	14.350	0.117
Description: Pre-Engineering and Manufacturing Development Activities			
FY 2019 Plans: Continue pre-development and upfront system engineering activities Continue requirements and technology analysis and market research Conduct Materiel Development Decision (MDD) Release Draft Request for Proposal (RFP) or Request for Proposal Review proposal submissions and engage in Source Selection/Technical Evaluation Activities			
FY 2020 Plans: Conduct Source Selection/Technical Evaluation Activities Award Engineering and Manufacturing Development (EMD) contract Initiate design and build of EMD assets Conduct EMD activities			
FY 2019 to FY 2020 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303131F / *Minimum Essential Emergency Communications Network (MEECN)*	**Project (Number/Name)** 676030 / *Global ASNT Inc 2*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Decrease due to re-plan of the GASNT Inc 2 effort			
Accomplishments/Planned Programs Subtotals	10.689	14.350	0.117

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Global ASNT used a full and open competitive approach to award an EMD contract for Increment 1. Global ASNT Inc. 2 will leverage Inc. 1 activities and will continue to use a competitive incremental approach to fulfill the overall requirements for Increments 2 and 3.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303131F / *Minimum Essential Emergency Communications Network (MEECN)*	**Project (Number/Name)** 676030 / *Global ASNT Inc 2*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Global ASNT Inc 2 - Pre-EMD Activities	TBD	Not specified. : TBD	-	7.526	Mar 2018	4.192	Mar 2019	0.000		-		0.000	Continuing	Continuing	-
Risk Reduction	TBD	Not specified. : TBD	-	-		4.892	Mar 2019	0.000		-		0.000	Continuing	Continuing	-
		Subtotal	-	7.526		9.084		0.000		-		0.000	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Global ASNT Inc 2 - MITRE Lab	Various	MITRE : Bedford, MA	-	-		-		-		-		-	Continuing	Continuing	-
Global ASNT Inc 2 - Information Assurance	Various	Booz Allen Hamilton : Bedford, MA	-	0.000		0.145	Mar 2019	0.000		-		0.000	Continuing	Continuing	-
		Subtotal	-	0.000		0.145		0.000		-		0.000	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Global ASNT Inc 2 - Test Planning	Various	Various : NV	-	0.000		0.177	Feb 2019	0.000		-		0.000	Continuing	Continuing	-
		Subtotal	-	0.000		0.177		0.000		-		0.000	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Global ASNT Inc 2 - PSC (Eng/Acq Support, Travel)	Various	Various : NV	-	3.163	Feb 2018	4.944	Oct 2018	0.117	Oct 2019	-		0.117	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303131F / *Minimum Essential Emergency Communications Network (MEECN)*	**Project (Number/Name)** 676030 / *Global ASNT Inc 2*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	3.163		4.944		0.117		-		0.117	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	10.689		14.350		0.117		-		0.117	Continuing	Continuing	N/A

Remarks

In FY19,Global ASNT Inc 2 will expend $0.380M on manpower positions hired under Direct Cite Authority.
In FY20,Global ASNT Inc 2 will expend $.117M on manpower positions hired under Direct Cite Authority.

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303131F / *Minimum Essential Emergency Communications Network (MEECN)*	**Project (Number/Name)** 676030 / *Global ASNT Inc 2*

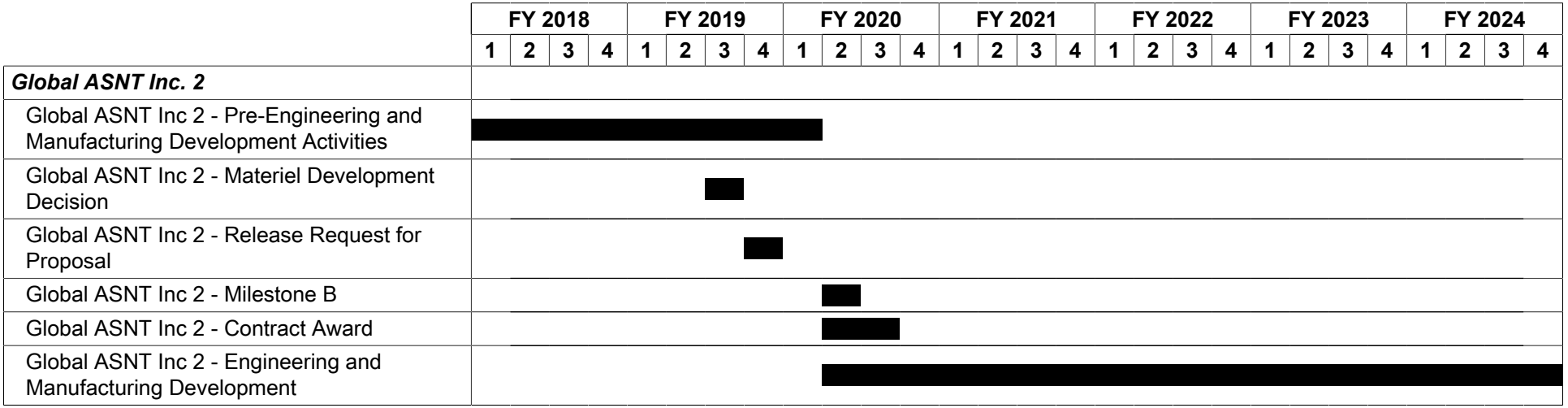


Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303131F / *Minimum Essential Emergency Communications Network (MEECN)*	**Project (Number/Name)** 676030 / *Global ASNT Inc 2*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Global ASNT Inc. 2				
Global ASNT Inc 2 - Pre-Engineering and Manufacturing Development Activities	1	2018	1	2020
Global ASNT Inc 2 - Materiel Development Decision	3	2019	3	2019
Global ASNT Inc 2 - Release Request for Proposal	4	2019	4	2019
Global ASNT Inc 2 - Milestone B	2	2020	2	2020
Global ASNT Inc 2 - Contract Award	2	2020	3	2020
Global ASNT Inc 2 - Engineering and Manufacturing Development	2	2020	4	2024

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0303133F / *High Frequency Radio Systems*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	0.000	51.612	15.881	0.000	15.881	0.000	0.000	0.000	0.000	0.000	67.493
675046: *Systems Engineering & Integration*	-	0.000	51.612	15.881	0.000	15.881	0.000	0.000	0.000	0.000	0.000	67.493
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Mission Description and Budget Item Justification: The HF Modernization program is designed to replace existing legacy High Frequency (HF) radios with a modernized HF radio on all Air Force (AF) aircraft that currently are equipped with HF radios (e.g., AN/ARC-190). The current HF radios installed on AF aircraft have reached obsolescence and there is a compelling need to modernize the HF capabilities. The replacement radio will have similar form and fit, but increased capability. The new radio needs to incorporate new technologies such as 3G/4G Automatic Link Establishment (ALE), wide band features that allow the radio to operate from 3 KHz up to 48 KHz channel spacing, and Low Probability of Intercept/Low Probability of Detection (LPI/LPD) features. The new HF radio should be software defined (SDR) to accommodate growth for newer technologies and embedded cryptographic options.

The current AN/ARC-190 radios, that serve a majority of HF airborne needs, will approach end of life ~2025 and do not have current capabilities to be sustainable for future years. Current and future AF aircraft with validated requirements for HF radios will experience a shortage of HF radios starting in FY20. With the increased shortage of spares, as the current HF radios continue to fail, Air Traffic Control (ATC), Air Operation Centers (AOC), and other controlling agencies will lose the ability to communicate with aircraft. HF Modernization provides alternate means of communication when satellite communications are not available due to nature and man-made disruptions. It is essential that these airborne radios keep pace to guarantee interoperability or theater C2 will be degraded.

Program management and administration efforts consist of, but are not limited to, contract services and government costs. This program element may include necessary civilian pay expenses required to manage, execute, and deliver HF Modernization effort. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements, 0605826F, 0605827F, 0605829F, 0605830F, 0605812F,0605898F,0605833F.

Funding for this exhibit contained in PE 0303133F.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0303133F / *High Frequency Radio Systems*

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	0.000	51.612	15.881	0.000	15.881
Current President's Budget	0.000	51.612	15.881	0.000	15.881
Total Adjustments	0.000	0.000	0.000	0.000	0.000
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: High Frequency Radio System	0.000	51.612	15.881
Description: Development of High Frequency Radio System ***FY 2019 Plans:*** Development of High Frequency Radio System ***FY 2020 Plans:*** Development of High Frequency Radio System ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding decreased from FY19 to FY20 as result of DOD CIO funding availability.			
Accomplishments/Planned Programs Subtotals	0.000	51.612	15.881

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Major Thrust - Funding decrease from FY19 to FY20 as result of DOD CIO funding availability.

E. Acquisition Strategy

Efforts awarded on an annual basis, exercising existing contract options, to support Development of High Frequency Radio System.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0303133F / *High Frequency Radio Systems*

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303133F / *High Frequency Radio Systems*	**Project (Number/Name)** 675046 / *Systems Engineering & Integration*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
High Frequency Radio System	TBD	Not specified. : TBD	-	-		51.612		15.881		-		15.881	Continuing	Continuing	-
		Subtotal	-	-		51.612		15.881		-		15.881	Continuing	Continuing	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		51.612		15.881		-		15.881	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303133F / *High Frequency Radio Systems*	**Project (Number/Name)** 675046 / *Systems Engineering & Integration*

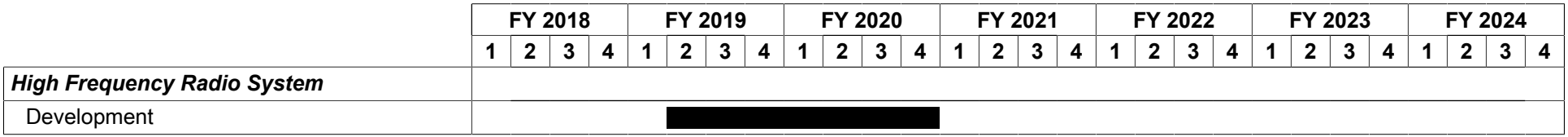


Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303133F / *High Frequency Radio Systems*	**Project (Number/Name)** 675046 / *Systems Engineering & Integration*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
High Frequency Radio System				
Development	2	2019	4	2020

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0303140F / *Information Systems Security Program*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	41.067	33.979	27.726	0.000	27.726	11.156	13.618	13.429	61.685	Continuing	Continuing
675100: *Cryptographic Modernization*	-	39.045	32.526	27.726	0.000	27.726	11.156	13.618	13.429	61.685	Continuing	Continuing
675231: *AF Key Management Enterprise (AF KME)*	-	2.022	1.453	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

Information Systems Security Program (ISSP) - Includes resources, manpower authorizations, necessary facilities and equipment required to perform INFOSEC research and development, to provide INFOSEC services, to procure INFOSEC products required to secure telecommunications and information systems when such products are separately procurable from host systems, and to provide INFOSEC maintenance and support. Also includes costs associated with the protection afforded to telecommunications and information systems which process sensitive data and efforts to ensure confidentiality, integrity, and availability of the information and the system.

The ISSP Element provides cradle-to-grave research, development, acquisitions, supply, sustainment, depot maintenance, and demilitarization of the Air Force (AF) cryptographic and key distribution /management systems (known as the Key Management Enterprise (KME)). ISSP delivers on rising national, DoD, and AF priorities to address cyber security threats and increasing war-fighter dependence on cyberspace. The AF and the DoD require the capability to secure, collect, process, store, and disseminate an uninterrupted flow of information, while denying an adversary the ability to intercept, collect, destroy, interpret, or manipulate our information flows. Secure communication allows the DoD to achieve and maintain decision superiority, the key to successful application of the military instrument of national power in modern, high-tempo, full-spectrum operations. AF Communications Security (COMSEC) equipment protects information such as war-fighter positions, mission planning, target strikes, commanders orders, intelligence, force strength, and force readiness and ensures adversaries cannot interpret, manipulate, or destroy information. When an adversary is capable of interpretation, manipulation, or destruction of the information used by the war-fighter, DoD military forces will suffer significant and/or devastating mission degradation that can result in loss of life and resources and/or exceptionally grave damage to national security.

The overall focus of the Research, Development, Test, and Evaluation (RDT&E) efforts within this program is to transform electronic key delivery and cryptographic devices to meet the next generation war-fighting requirements. These efforts are driven by the National Security Agency's (NSA) mandates to address decertifications, new requirements, and end of life issues. NSA's first tenet calls for an AF KME that permits a totally "man-out-of-the-loop" electronic crypto key distribution system from the generation of the key in the key processor all the way into the using End Crypto Unit (ECU). This eliminates the current key vulnerability of compromise /interruption by individuals transporting or loading the key. NSA's second tenet requires an inventory of cryptographic devices that are more robust, modular, scalable, capable, net-centric, and durable. This enables more effective and efficient performance including reduced inventory, expanded data rates, simplified upgrades, lower life cycle costs, and ensured global information grid-compatibility.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0303140F / *Information Systems Security Program*

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

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	42.973	34.612	29.788	0.000	29.788
Current President's Budget	41.067	33.979	27.726	0.000	27.726
Total Adjustments	-1.906	-0.633	-2.062	0.000	-2.062
• Congressional General Reductions	-0.396	-0.633			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-1.510	0.000			
• Other Adjustments	0.000	0.000	-2.062	0.000	-2.062

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0303140F / *Information Systems Security Program*	Project (Number/Name) 675100 / *Cryptographic Modernization*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675100: *Cryptographic Modernization*	-	39.045	32.526	27.726	0.000	27.726	11.156	13.618	13.429	61.685	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The AF Cryptographic Modernization Effort modernizes cryptographic devices protecting critical national security information across cyber domain operations. In September 2000, the Defense Review Board (DRB) tasked National Security Agency (NSA) to evaluate the security posture of the cryptographic inventory. Systems with aging algorithms, those approaching non-sustainability, and those generally incompatible with modern key management systems were also identified and have been replaced or are in the process of being replaced. Priority systems that required immediate replacement were also identified. In addition, NSA documented the need to modernize the cryptographic inventory with capabilities designed to enable network-centric operations. Replacements/Modernization of the near term vulnerable systems must occur within the timeframe specified by device and algorithm in Chairman Joint Chiefs of Staff Notice (CJCSN) 6510. The DoD Cryptographic Modernization Program was established to develop a modern cryptographic base that provides this assured security robustness, interoperability, advanced algorithms, releasability, programmability, and compatibility with the future Key Management Infrastructure (KMI-See PE 0303140F, Project 67523, AF KMI for a full description). This AF effort supports an integrated effort across the cyber domain to transform to next-generation cryptographic capabilities. It provides U.S. forces and multinational and interagency partners the security needed to protect the flow and exchange of operational decision making information in accordance with national and international policy/standards, the validated operational requirements of the warfighters, and the intelligence communities.

The AF Cryptographic Modernization Effort is a collection of projects accomplished in three phases: replacement, modernization, and transformation. The replacement phase of the program focused on updating and/or replacing out-of-date algorithms along with unsustainable cryptographic products. The modernization phase provides crypto devices with common solutions that are more robust, modular, scalable, and provide the durability to existing cryptographic end items, as well as updating mid-term aging/unsupportable crypto equipment. Manpower and logistics requirements will be reduced and manpower efficiencies gained, while incremental capability enhancements and footprint reduction are provided. The third phase of the Cryptographic Modernization Program, transformation, provides common joint solutions which enable secure, transparent, network-centric capabilities across the cyber domain. Activities also include studies and analysis to support both current program planning/execution and future program planning.

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

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Technology Development (TD)	1.684	1.215	14.154

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303140F / *Information Systems Security Program*	**Project (Number/Name)** 675100 / *Cryptographic Modernization*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: Technical Development (TD) conducts concept development and early systems engineering activities to analyze evolving threats and Communications Security (COMSEC) capability gaps across AF and DoD mission areas. Develops, plans and executes foundational technology demonstration efforts to inform COMSEC requirements, concept characterization and technical description (CCTD), and support cost estimates prior to Materiel Development Decision (MDD) for future cryptographic initiatives. Mitigates risk for thousands of AF and DoD users affected by algorithm security issues and ensures required security upgrades can be integrated into the AF and DoD enterprise. Works closely with NSA and other services to develop standards that increase security of communication and information products and facilitate efficient crypto and COMSEC enterprise management. Includes but is not limited to: Common Cryptologic Management Information Base (CC MIB), Advanced Cryptographic Capabilities Increment One (ACC Inc. 1), Cryptographic Modernization 2 (CM2), Trusted Systems Network (TSN)/Supply Chain Risk Management (SCRM), Space Aligned Ground Equipment (SAGE), and MILSATCOM Crypto Mod (MCM). Space Aligned Ground Equipment (SAGE) addresses capability gaps by developing Ground Operating Equipment (GOE) to support modular cryptography, operating at higher data rates, incorporating enhanced system protective capabilities, and including tenants of the Warrior Construct. MILSATCOM Crypto Modernization (MCM) Initiative is comprised of the Protected Tactical SATCOM (PTS) and Evolved Strategic Satellite (ESS). The PTS Crypto Program will provide the cryptographic capabilities for Telemetry, Tracking, & Commanding (TT&C) links for the Protected Tactical SATCOM. This satellite system will provide worldwide, beyond line of sight, Anti-Jam (AJ), low probability of intercept communications to tactical warfighters in both benign and contested environments via space-based fully processed SATCOM payloads. The centerpiece of the PTS system will be a new, more resilient Protected Tactical Waveform (PTW), designed to mitigate the effects of advanced jamming in Anti-Access/Area Denial environments. The ESS Crypto Program will provide the cryptographic capabilities for the Mission Communications and TT&C links for the ESS system. This satellite system will be a follow-on program to the Advanced Extremely High Frequency (AEHF) satellite constellation providing survivable, global, secure, protected, and jam-resistant communications for high-priority military ground, sea and air assets. ESS satellites will be interoperable with existing AEHF satellites and AEHF-compatible sea, air and ground SATCOM terminals. ESS satellites will also extend the Enhanced Polar Satellite (EPS) systems missions as they operate in a highly elliptical orbit. ***FY 2019 Plans:*** - Continue to conduct research to support the replacement or upgrade of obsolete Air Force cryptographic devices in support of the Advanced Cryptographic Capabilities Increment One (ACC Inc. 1) initiative - Continue to identify AF materiel solutions requiring modification or acquisition under the joint Cryptographic Modernization 2 (CM2) Initial Capabilities Document (ICD) and provide information to AF Lead Command to support AF1067 modifications or JCIDS documentation for follow-on acquisition - Conduct Technology Maturation and Risk Reduction (TMRR) activities to support cryptographic equipment modifications and new cryptographic equipment developments within the scope of the CM2 program			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303140F / *Information Systems Security Program*	**Project (Number/Name)** 675100 / *Cryptographic Modernization*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Continue development of the Common Cryptologic Management Information Base (CC MIB) standard that will enable accurate tracking and management of crypto assets across the AF in support of the CM2 developments - Continue to develop system security documentation (OPSEC Plans, Cybersecurity Plans, Security Classification Guidance (SCG), Integrated Threat Assessments (ITAs), Anti-Tamper Planning and Program Protection Planning - Continue to develop the necessary TSN processes to deliver a trusted system (integrating all source supply chain information, threat to risk methodologies, mapping of both SCRM Key Practices and Risk Management Framework (RMF) mitigations, risk strategies, and technical mitigations for both H/W and S/W) - Continue to provide both counterfeit detection (H/W analysis) and Malware Analysis (S/W analysis) - Continue to provide TSN contract language and clauses to effectively acquire trusted systems - Continue to refine analysis for the replacement or upgrade of space Ground Operating Equipment (GOE) devices in support of the Space Aligned Ground Equipment (SAGE) initiative and associated activities in preparation for Decision Point 2 (DP-2) to support a Materiel Development Decision - Continue to conduct analysis for the replacement or upgrade of legacy MILSATCOM crypto devices in support of the MILSATCOM Crypto Modernization (MCM) Initiative and associated activities in preparation for Decision Point 2 (DP-2) approval to support a Materiel Development Decision			
FY 2020 Plans: - Will conduct research to support the replacement or upgrade of obsolete Air Force cryptographic devices in support of the Advanced Cryptographic Capabilities Increment 1 (ACC Inc. 1) initiative - Will identify AF materiel solutions requiring modification or acquisition under the joint Cryptographic Modernization 2 (CM2) Initial Capabilities Document (ICD) and provide information to AF Lead Command to support AF1067 modifications or JCIDS documentation for follow-on acquisition - Will conduct Technology Maturation and Risk Reduction (TMRR) activities, execute AF 1067 cryptographic equipment modifications, and begin new cryptographic equipment developments within the scope of the CM2 program - Will continue development of the Common Cryptologic Management Information Base (CC MIB) standard that will enable accurate tracking and management of crypto assets across the AF in support of the CM2 developments - Will develop system security documentation (OPSEC Plans, Cybersecurity Plans, Security Classification Guidance (SCG), Integrated Threat Assessments (ITAs), Anti-Tamper Planning and Program Protection Planning - Will develop the necessary TSN processes to deliver a trusted system (integrating all source supply chain information, threat to risk methodologies, mapping of both SCRM Key Practices and Risk Management Framework (RMF) mitigations, risk strategies, and technical mitigations for both H/W and S/W) - Will provide both counterfeit detection (H/W analysis) and Malware Analysis (S/W analysis) - Will provide TSN contract language and clauses to effectively acquire trusted systems			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303140F / *Information Systems Security Program*	**Project (Number/Name)** 675100 / *Cryptographic Modernization*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
-Will continue to refine analysis for the replacement or upgrade of space Ground Operating Equipment (GOE) devices in support of the Space Aligned Ground Equipment (SAGE) initiative and associated activities in preparation for Decision Point 2 (DP-2) to support a Materiel Development Decision Will conduct analysis for the replacement or upgrade of legacy MILSATCOM crypto devices in support of the MILSATCOM Crypto Modernization (MCM) Initiative and associated activities in preparation for Decision Point 2 (DP-2) approval to support a Materiel Development Decision ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding increased due to Cryptographic Modernization 2 (CM2) requirements			
Title: Mini Crypto (MC) ***Description:*** Mini Crypto (MC) is developing a Tactical Key Management (TKM) miniaturized cryptographic solution to protect Secret and Below (SaB) Command and Control (C2) and mission data for Size, Weight, and Power (SWaP) constrained platforms which currently have no cryptographic capability and transmit in the clear. MC's Tactical Key Management (TKM) solution has a self-generating key which removes the requirement for pre-placed keys and has the ability to add or remove users as tactical situation dictates. ***FY 2019 Plans:*** N/A ***FY 2020 Plans:*** N/A	2.506	0.000	0.000
Title: Space Modular Common Crypto (SMCC) ***Description:*** Space Modular Common Crypto (SMCC) provides Information Assurance (IA) services for new satellite architectures via a family of common crypto solutions that integrate Tracking, Telemetry, & Commanding (TT&C), Mission Data (MD), and/or Transmission Security (TRANSEC) key stream functions for the Air Force and Intelligence Community space systems. ***FY 2019 Plans:*** - Conclude Technology Maturation and Risk Reduction (TMRR) activities - Continue SMCC AES-256 Crypto Engine (ACE) Common Solution (ACS) development contract activities - Continue SMCC Medium/Large [satellite] Common Solution (MLCS) development contract activities ***FY 2020 Plans:*** - Will ramp down SMCC ACS development contract activities	31.020	27.826	10.124

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303140F / *Information Systems Security Program*	**Project (Number/Name)** 675100 / *Cryptographic Modernization*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Will ramp down SMCC MLCS development activities ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funded decreased due to ramp down in SMCC development contract activities			
Title: Algorithm Transition Compliance and Support ***Description:*** Supports Air Combat Command (AF lead for Cyber Superiority) in Algorithm Transition Compliance and provides Information Assurance (IA) support by conducting analysis on all utilized cryptographic algorithms and hundreds of cryptographic equipment types to support transition efforts. This includes the development and planning of technology demonstrations to ensure new algorithms can be integrated into the multitude of devices across the AF crypto enterprise, determining and monitoring mitigation strategies to address vulnerabilities, and tracking and reporting algorithm/device integration. Assesses current state of AF cryptography across the enterprise and develops the Cryptographic Roadmap. Develops and maintains a classified Crypto Modernization (CM) database system that tracks status of AF crypto device types that is accessible by the CM community via SIPRNET. Efforts support NC3, ISR, all AF platforms, and most ground networks. ***FY 2019 Plans:*** - Continue to analyze the AF crypto enterprise and provide situational awareness of significant risks related to aging inventory and cryptographic vulnerabilities - Continue to provide analysis of adequacy of COMSEC products in support of NSA requirements, sustainment issues, and the state of technology - Provide Crypto Mod analysis database to AF community to assist in annual assessments and long term efforts to develop enterprise capabilities based assessment (CBA) and to identify technical capability gaps - Conduct annual assessment of the state of the AF cryptographic enterprise and update the Cryptographic Roadmap ***FY 2020 Plans:*** - Will analyze the AF crypto enterprise and provide situational awareness of significant risks related to aging inventory and cryptographic vulnerabilities - Will continue to provide analysis of adequacy of COMSEC products in support of NSA requirements, sustainment issues, and the state of technology - Will provide Crypto-Mod analysis database to AF community to assist in annual assessments and long term efforts to develop enterprise capabilities based assessment (CBA) and to identify technical capability gaps - Will conduct annual assessment of the state of the AF cryptographic enterprise and update the Cryptographic Roadmap ***FY 2019 to FY 2020 Increase/Decrease Statement:***	1.835	3.385	3.448

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303140F / *Information Systems Security Program*	**Project (Number/Name)** 675100 / *Cryptographic Modernization*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Funding increased due to Crypto Modernization 2 (CM2) support			
Title: Missile Electronic Encryption Device (MEED) Modification ***Description:*** The MEED Modification upgraded the legacy Missile Entry Control System (MECS) devices used to securely authenticate personnel attempting access to this Nation's ground-based Intercontinental Ballistic Missile (ICBM) facilities. This effort will bring the MEED equipment into compliance with current NSA information assurance (IA) security design guidance. ***FY 2019 Plans:*** N/A ***FY 2020 Plans:*** N/A	1.505	0.000	0.000
Title: Classified Data At Rest (CDAR) ***Description:*** CDAR plans to develop and procure an NSA approved modernized cryptographic solution(s) for use in ISR, C2, and EW platforms exposed to hostile/uncontrolled environments. The enterprise cryptographic solution will encrypt/decrypt Top Secret and Below (TSAB) data at rest residing in a variety of data storage environments. ***FY 2019 Plans:*** - Develop requirements documentation and acquisition strategy in preparation for Milestone B (MS B) - Coordinate security requirements with NSA and conduct market research in preparation for CDAR development request for proposal (RFP) ***FY 2020 Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A	0.146	0.100	0.000
Title: VINSON/ANDVT Cryptographic Modernization (VACM) ***Description:*** VINSON (VHF (Very High Frequency)/UHF (Ultra High Frequency) Wideband Tactical Secure Voice System Cryptographic Equipment)/ANDVT (Advanced Narrowband Digital Voice Terminal) Cryptographic Modernization (VACM) will develop and acquire cryptographic capability to replace the legacy capability on VINSON/ANDVT secure voice communications on aircraft, ships, and ground fixed mobile platforms (Devices: KY-57/58, KY-99/100, KYV-5 and ARC-234 (with Embedded Crypto). The program will develop and acquire Remote Control Units (RCU) to augment and replace depleting legacy RCU	0.349	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303140F / *Information Systems Security Program*	**Project (Number/Name)** 675100 / *Cryptographic Modernization*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
inventory. The RCU project is a permanent sustainment modification effort (AF 1067) (Devices: Z-ANP, Z-AHP, Z-AVH, Z-ANH, A-ANG) ***FY 2019 Plans:*** If funding became available, the RCU project plans to award a contract for Increment 1 RCU development. Increment 1 will develop new form, fit replacement KY-58M RCUs (Z-ANP/Z-AHP) that addresses legacy obsolescence issue while maintaining all legacy capabilities. ***FY 2020 Plans:*** If funding became available, the RCU project will continue Increment 1 development and testing of new RCU's and begin early acquisition RCU activity for Increment 2 development.			
Accomplishments/Planned Programs Subtotals	39.045	32.526	27.726

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPAF 03 831010: *COMSEC Equipment*	60.509	54.675	49.979	-	49.979	48.752	49.573	50.454	51.359	Continuing	Continuing

Remarks

Remarks: Other Program Funding reflects Crypto Modernization (CM) portion of Information Systems Security Program (ISSP) OPAF total.

D. Acquisition Strategy

Implement AF portion of the DoD's Cryptographic Modernization (CM) Initiative through modernization/modification efforts, in varying stages of the acquisition cycle, with focus on minimizing life cycle costs. The CM portfolio of component acquisition projects is executing using a variety of approaches that vary from an evolutionary acquisition strategy using spiral development (for new component development) to incremental improvement leveraging leading-edge, certified non-developmental items (for modernization). Contract type is selected for each of the individual projects based upon its acquisition approach and its unique technology risks. A mixture of fixed-price and cost-reimbursement contracts have been selected which maximize the best value for the Government.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303140F / *Information Systems Security Program*	**Project (Number/Name)** 675100 / *Cryptographic Modernization*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Tech Development	Various	MULTIPLE : MULTIPLE	-	0.269	Jan 2018	0.226	Jan 2019	14.152	Jan 2020	-		14.152	Continuing	Continuing	-
Mini Crypto	C/CPIF	VIASAT, INC : Carlsbad, CA	-	1.717	Apr 2018	-		-		-		-	Continuing	Continuing	-
Space Modular Common Crypto (SMCC)	C/CPIF	MULTIPLE : MULTIPLE	-	26.499	Dec 2017	23.664	Dec 2018	9.383	Dec 2019	-		9.383	Continuing	Continuing	-
		Subtotal	-	28.485		23.890		23.535		-		23.535	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Mini Crypto	Various	MULTIPLE : MULTIPLE	-	0.441	Mar 2018	0.371	Mar 2019	-		-		-	Continuing	Continuing	-
Space Modular Common Crypto (SMCC)	Various	MULTIPLE : MULTIPLE	-	2.153	Dec 2017	1.811	Dec 2018	0.743	Dec 2019	-		0.743	Continuing	Continuing	-
		Subtotal	-	2.594		2.182		0.743		-		0.743	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Administration (PMA)	Various	Various : Various	-	7.966	Dec 2017	6.454	Dec 2018	3.448	Dec 2019	-		3.448	Continuing	Continuing	-
		Subtotal	-	7.966		6.454		3.448		-		3.448	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	39.045		32.526		27.726		-		27.726	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303140F / *Information Systems Security Program*	**Project (Number/Name)** 675100 / *Cryptographic Modernization*

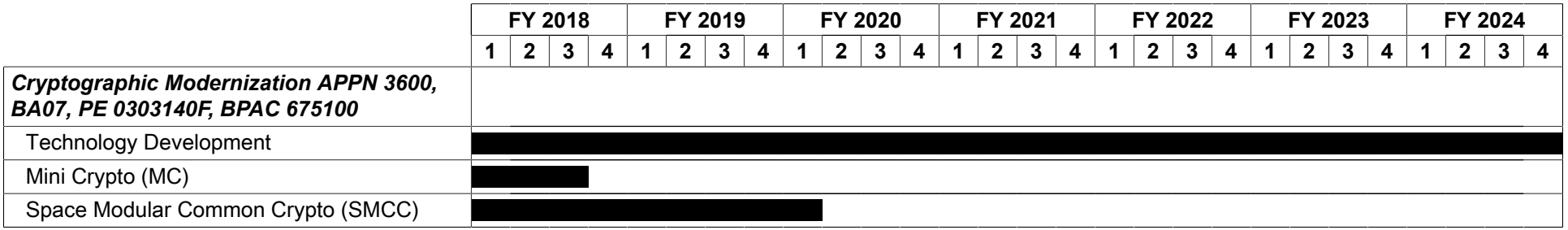


Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303140F / *Information Systems Security Program*	**Project (Number/Name)** 675100 / *Cryptographic Modernization*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Cryptographic Modernization APPN 3600, BA07, PE 0303140F, BPAC 675100				
Technology Development	1	2018	4	2024
Mini Crypto (MC)	1	2018	3	2018
Space Modular Common Crypto (SMCC)	1	2018	1	2020

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0303140F / *Information Systems Security Program*	Project (Number/Name) 675231 / *AF Key Management Enterprise (AF KME)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675231: *AF Key Management Enterprise (AF KME)*	-	2.022	1.453	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Air Force Key Management Enterprise (AF KME) Program consists of multiple developments supporting the AF requirements/portion of the DoD Key Management Infrastructure (KMI). The National Security Agency (NSA) acts as the Executive Agent for the DoD KMI Program. AF KMI, in concert with this overarching DoD KMI Program, will provide a secure and flexible capability for the electronic generation, distribution, accounting, and management of key material and other communications security (COMSEC) materials for all DoD Command, Control, Communications, Computers, and Intelligence (C4I) systems and for the Services' weapon systems. KMI represents a broad-scale replacement of the current Electronic Key Management System (EKMS). KMI will provide capabilities that will allow networked operation in consonance with the AF Information Network and other DoD, fellow Service, and AF enterprise objectives. It thereby will assure a viable support infrastructure for future weapons and C4I programs to incorporate key management into their system designs.

The DoD KMI will greatly improve protection of national security-related information by substantially enhancing confidentiality, integrity, and non-repudiation characteristics over the legacy EKMS. KMI will greatly accelerate the availability of crypto key materials through electronic transmission versus shipping of materials, will enhance mission responsiveness and flexibility, and will eventually take the man "out-of-the-loop" in the distribution of crypto key materials.

The AF KMI Program in concert with the DoD KMI Program is transitioning the Air Force from the legacy EKMS to modern DoD KMI and building the AF KME Tier 3 architecture. This Research and Development effort includes system engineering, development and testing to successfully implement the AF KMI Last Mile architecture as part of the AF Key Management Enterprise (KME). The AF KME Tier 3 is a holistic solution integrating the legacy and new and evolving cryptographic programs, materials, products, sources and consumers. The AF KME Tier 3 capabilities include as part of the AF KME distribution, management, and loading of cryptographic materials from the KMI (COMSEC account) to the end cryptographic unit (ECU). It builds the linkage interfaces that will allow KMI systems to communicate and integrate other related developments to meet operational needs. AF KME Tier 3 is currently in the Development Phase. Activities also include studies and analysis to support both current program planning and execution and future program planning.

In parallel with AF KMI, DoD and the Services are addressing the need for a new generation of future KMI-aware ECUs that will be capable of direct interaction with the DoD KMI Enterprise, under the Joint Crypto Modernization Initiative (PE0303140F, BPAC 675100, Cryptographic Modernization, supports this initiative). In some cases these new ECUs, although needing to be supported by KMI, will not be KMI network-connected. "Last mile" transport of black (aka benign, or encrypted) and red (unencrypted) keying material from a KMI client to a new generation ECU or current legacy ECU will need to be handled in the early years by one of two data transfer devices.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303140F / *Information Systems Security Program*	**Project (Number/Name)** 675231 / *AF Key Management Enterprise (AF KME)*

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

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Air Force KME Tier 3 Space & Naval Warfare Systems Command (SPAWAR) Support (Tier 3) ***Description:*** Support includes architectural planning, systems engineering, testing and studies and analyses for migration to the Key Management Infrastructure (KMI) (includes acquisition planning, systems integration, engineering support and System Program Office (SPO) support). Transitioned existing key management capabilities to AF KME Tier 3. ***FY 2019 Plans:*** - Continue to provide annual resources to SPAWAR to plan and execute specific profile Air Force ECUs - Continue to develop and integrate/test MS App with existing Tier 3 Key Loaders ***FY 2020 Plans:*** - Will continue to provide annual resources to SPAWAR to plan and execute specific profile Air Force ECUs - Will continue to develop and integrate/test MS App with existing Tier 3 Key Loaders ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding decreased due to ramping down of development and test efforts	1.905	1.453	0.000
Title: AF KME Tier 3 ***Description:*** Air Force KME Tier 3 early system engineering, risk reduction and engineering development to include: concept development for distribution, load and management elements of last mile; studies and analyses for technology possibilities and prototyping efforts for the last mile; and development of a certified KMI-aware, Product Delivery Enclave - enabled key load device. ***FY 2019 Plans:*** N/A ***FY 2020 Plans:*** N/A	0.117	0.000	0.000
Accomplishments/Planned Programs Subtotals	2.022	1.453	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303140F / *Information Systems Security Program*	**Project (Number/Name)** 675231 / *AF Key Management Enterprise (AF KME)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPAF 03 831010: *COMSEC Equipment*	0.360	2.654	2.623	-	2.623	1.956	2.909	2.961	3.013	Continuing	Continuing

Remarks

Remarks: Other Program Funding reflects AF Key Management Infrastructure (KMI) portion of Information Systems Security Program (ISSP) OPAF total.

D. Acquisition Strategy

Implement AF portion of the DoD's Cryptographic Modernization (CM) Initiative through modernization/modification efforts, in varying stages of the acquisition cycle, with focus on minimizing life cycle costs. All major contracts within this project are open to full and open competition with technology knowledge, expertise, and prior experience on similar projects weighted heavily in the evaluation process.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0303140F / *Information Systems Security Program*	Project (Number/Name) 675231 / *AF Key Management Enterprise (AF KME)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AF KMI Last Mile (Tier 3)	C/CPIF	L3 Comm : Camden, NJ	-	1.335	Mar 2018	1.258	Mar 2019	0.000		-		0.000	Continuing	Continuing	13.364
		Subtotal	-	1.335		1.258		0.000		-		0.000	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering & Technical Documentation	SS/T&M	MITRE : San Antonio, TX	-	-		-		-		-		-	Continuing	Continuing	-
Engineering & Technical Acquisition Support Service	C/CPFF	Abacus Technology Corp. : Chevy Chase, MD	-	0.071	Jan 2018	-		-		-		-	Continuing	Continuing	-
AF KMI Last Mile (Tier 3)	MIPR	U.S. Navy SPAWAR : San Diego, CA	-	0.357	May 2018	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	0.428		-		-		-		-	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
KMI Last Mile (Tier 3)	PO	46 TS : Eglin AFB, FL	-	0.078	Mar 2018	-		-		-		-	Continuing	Continuing	-
NSA Test Support	MIPR	NSA : FT Meade, MD	-	-		-		-		-		-	Continuing	Continuing	-
KMI Last Mile TEST	MIPR	605 TES : Eglin AFB, FL	-	-		-		-		-		-	Continuing	Continuing	-
CERDEC/PD Net E	MIPR	US Army : Aberdeen Proving Ground, MD	-	-		-		-		-		-	Continuing	Continuing	-
Joint Interoperability Test Command	MIPR	JITC : Ft. Huachuca, AZ	-	-		-		-		-		-	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303140F / *Information Systems Security Program*	**Project (Number/Name)** 675231 / *AF Key Management Enterprise (AF KME)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	0.078		-		-		-		-	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Administration (PMA)	Various	Various : Various	-	0.181	Dec 2017	0.195	Dec 2018	-		-		-	Continuing	Continuing	-
		Subtotal	-	0.181		0.195		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	2.022		1.453		0.000		-		0.000	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303140F / *Information Systems Security Program*	**Project (Number/Name)** 675231 / *AF Key Management Enterprise (AF KME)*

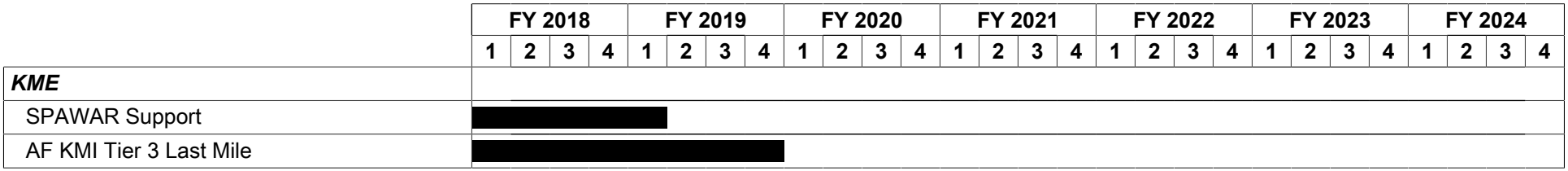


Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303140F / *Information Systems Security Program*	**Project (Number/Name)** 675231 / *AF Key Management Enterprise (AF KME)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
KME				
SPAWAR Support	1	2018	1	2019
AF KMI Tier 3 Last Mile	1	2018	4	2019

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0303141F / *Global Combat Support System*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	0.101	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.101
675046: *Systems Engineering & Integration*	-	0.101	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.101
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Enterprise Protection Risk Management (EPRM) is an automated risk management framework to assess and mitigate cyber and other threats to Air Force information technology and mission assets. This capability eliminates stove pipes and provides commanders with better situational awareness of vulnerabilities. Additionally, this capability promotes efficiency and sound resource allocation by enabling commanders to make better decisions when selecting risk reduction counter measures.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	0.105	0.000	0.000	0.000	0.000
Current President's Budget	0.101	0.000	0.000	0.000	0.000
Total Adjustments	-0.004	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	-0.004	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

Change Summary Explanation

Completion Action: In FY18 Enterprise Protection Risk Management completed.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0303141F / *Global Combat Support System*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Develop Enterprise Protection Risk Management (EPRM)	0.101	0.000	0.000
Description: Enterprise Protection Risk Management (EPRM) is an automated and standardized risk management application designed to support the Defense Security Enterprise in mitigating security risks to Air Force assets. EPRM addresses cyber, physical, information and industrial security as well as program protection planning. EPRM prioritizes Courses of Action (COAs) for relative value to protect multiple assets from multiple threat tactics, techniques, and procedures. EPRM received certification and accreditation and hosting was established at DISA. ***FY 2019 Plans:*** N/A ***FY 2020 Plans:*** N/A			
Accomplishments/Planned Programs Subtotals	0.101	0.000	0.000

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

EPRM RDT&E funding is placed on a cost-plus fixed fee contract to support continued development and enhancement of COTS software.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303141F / *Global Combat Support System*	**Project (Number/Name)** 675046 / *Systems Engineering & Integration*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Develop Enterprise Protection Risk Management (EPRM)	C/CPFF	Alion Science and Technology : Alexandria, VA	-	0.101	Apr 2018	-		-		-		-	0.000	0.101	-
		Subtotal	-	0.101		-		-		-		-	0.000	0.101	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.101		0.000		-		-		-	0.000	0.101	N/A

Remarks

None.

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303141F / *Global Combat Support System*	**Project (Number/Name)** 675046 / *Systems Engineering & Integration*

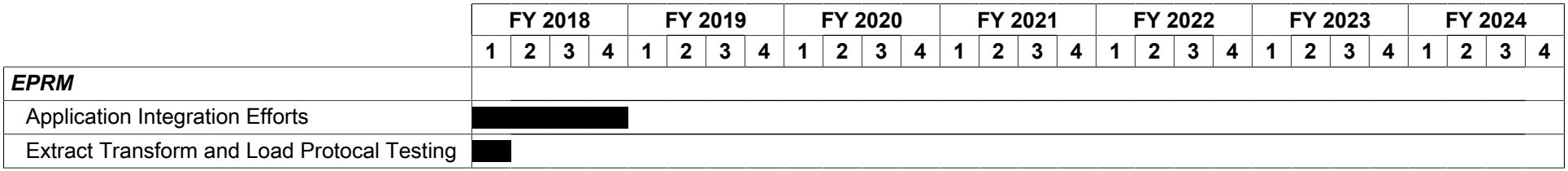

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303141F / *Global Combat Support System*	**Project (Number/Name)** 675046 / *Systems Engineering & Integration*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
EPRM				
Application Integration Efforts	1	2018	4	2018
Extract Transform and Load Protocal Testing	1	2018	1	2018

Note

Global Combat Support Systems - Air Force is a program in sustainment. After FY12, the Air Force will use Operations and Maintenance funding to maintain support to this key shared infrastructure.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0303142F / *Global Force Management - Data Initiative*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	1.944	2.170	2.210	0.000	2.210	1.348	0.459	0.000	0.000	0.000	8.131
676027: *Global Force Mgt Initative*	-	1.944	2.170	2.210	0.000	2.210	1.348	0.459	0.000	0.000	0.000	8.131
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Global Force Management Data Initiative (GFM DI) is a Joint Staff and the Office of the Secretary of Defense (OSD) initiative to standardize force structure data, making it visible, accessible, and understandable across the Department of Defense (DoD). This initiative is accomplished through each service's Organizational Server. The Air Force Organizational Server (AFOS) consumes data from various Air Force Authoritative Data Sources (ADSs), validates it, formats it in a consistent force structure data standard, and publishes it for consumption by programs of record that use force structure data. The AFOS is the ADS for Air Force Authorized Force Structure and provides critical unit, billet, crew platform, vehicle, and command relationship data within the Air Force to the Joint Staff (J8) for war and contingency planning, by providing visibility of the entire force structure as a function of time: past, present and future.

The AFOS produces consistent force structure data in the Global Force Management Information Exchange Model format that is well defined, centrally managed, and inter-operable as a standardized representation of the organization's hierarchy in all other programs of record that use force structure data. The end goal of the GFM-DI AFOS is to integrate the four force management processes (Assignment, Manpower & Personnel, Readiness, and Allocation), and ensure the data is available to meet the needs of all users, systems and functions.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver the GFM-DI system capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605833F, and 0605898F.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0303142F / *Global Force Management - Data Initiative*

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	2.147	2.170	2.210	0.000	2.210
Current President's Budget	1.944	2.170	2.210	0.000	2.210
Total Adjustments	-0.203	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	-0.125	0.000			
• SBIR/STTR Transfer	-0.078	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

Change Summary Explanation

- FY2018 Reprogrammings $0.125M as BTR out.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Global Force Management - Data Initiative	1.944	2.170	2.210	0.000	2.210

Description: The GFM-DI is a combination of net-centric services designed to provide access to information on the operational availability of USAF forces and equipment. GFM-DI is part of a Joint GFM, (each service has a GFM-DI), directed by OSD and the JCS.

FY 2019 Plans:

- Reengineer the Air Force Organizational Server (AFOS) database to improve maintainability and overall performance enhancements
- Implement General Officer Steering Council directed updates to the GFM Data Model for improved unit name visibility
- Add an automated AFOS system performance monitoring and reporting capability
- Add enhanced administration and metric collection tools to the AFOS

FY 2020 Base Plans:

- Will receive Joint Staff J8 validation
- Implement major Joint Staff directed database changes

FY 2020 OCO Plans:

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0303142F / *Global Force Management - Data Initiative*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** - Funding increase of $0.040M due to annual inflation index					
Accomplishments/Planned Programs Subtotals	1.944	2.170	2.210	0.000	2.210

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

The program will utilize an evolutionary acquisition strategy resulting in the migration to a Joint Information Environment (JIE)-compliant platform, replacement of system Commercial-Off-the-Shelf (COTS) components with newer, more capable elements, and additional software releases to implement additional requirements.

The anticipated contract structure will be Firm-Fixed Price contract.

The Air Force Organizational Server (AFOS) PMO will utilize a mix of Service Level Agreements (SLA) and Interface Requirement Agreements with AFOS stakeholders and support agencies as part of its management strategy. SLAs will be developed with the Lead Developmental Test Organization and the Capabilities Integration Environment at Maxwell AFB-Gunter Annex. The AFOS PMO also maintains Memorandum of Agreements (MOAs) with several AFOS input and output systems, including Manpower Programming & Execution Systems, Air Force Directory Services, Air Force Equipment Management System, and Force Structure Data Management.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303142F / *Global Force Management - Data Initiative*	**Project (Number/Name)** 676027 / *Global Force Mgt Initative*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GFM-DI AFOS / Development Contract	C/FFP	Various : Various	-	1.509	Mar 2018	1.418	Mar 2019	1.458	Mar 2020	-		1.458	0.000	4.385	-
		Subtotal	-	1.509		1.418		1.458		-		1.458	0.000	4.385	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CIE Support - NIPR/SIPR Dev Environment	C/FFP	AFLCMC/HNIZ : Montgomery, AL	-	0.039	Sep 2017	0.031	Sep 2018	0.031	Sep 2020	-		0.031	0.000	0.101	-
ETASS - A&AS	C/CPFF	Oasis : Bedford, MA	-	0.230	Apr 2018	0.255	Apr 2019	0.255	Apr 2020	-		0.255	0.000	0.740	-
Enclave System Admin Services	MIPR	DISA: DECC-OKC : Montgomery, AL	-	0.059	Aug 2018	0.360	Aug 2019	0.360	Aug 2020	-		0.360	0.000	0.779	-
		Subtotal	-	0.328		0.646		0.646		-		0.646	0.000	1.620	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Lead Developmental Test Organization Independent Test & Evalaution	C/FFP	AFLCMC/HNIZ : MONTGOMERY, AL	-	0.056	Apr 2018	0.055	Apr 2019	0.055	Apr 2020	-		0.055	0.000	0.166	-
Architecture Support	C/FFP	DISA : MONTGOMERY, AL	-	0.000		-		-		-		-	0.000	0.000	-
		Subtotal	-	0.056		0.055		0.055		-		0.055	0.000	0.166	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0303142F / *Global Force Management - Data Initiative*	Project (Number/Name) 676027 / *Global Force Mgt Initative*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Aquisition SME Support	C/FFP	AFLCMC/HIB : MONTGOMERY, AL	-	-		-		-		-		-	0.000	0.000	-
Program Office Support	Various	AFLCMC/HIB : MONTGOMERY, AL	-	0.051	Oct 2017	0.051	Oct 2018	0.051	Oct 2019	-		0.051	0.000	0.153	-
		Subtotal	-	0.051		0.051		0.051		-		0.051	0.000	0.153	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	1.944		2.170		2.210		-		2.210	0.000	6.324	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303142F / *Global Force Management - Data Initiative*	**Project (Number/Name)** 676027 / *Global Force Mgt Initative*

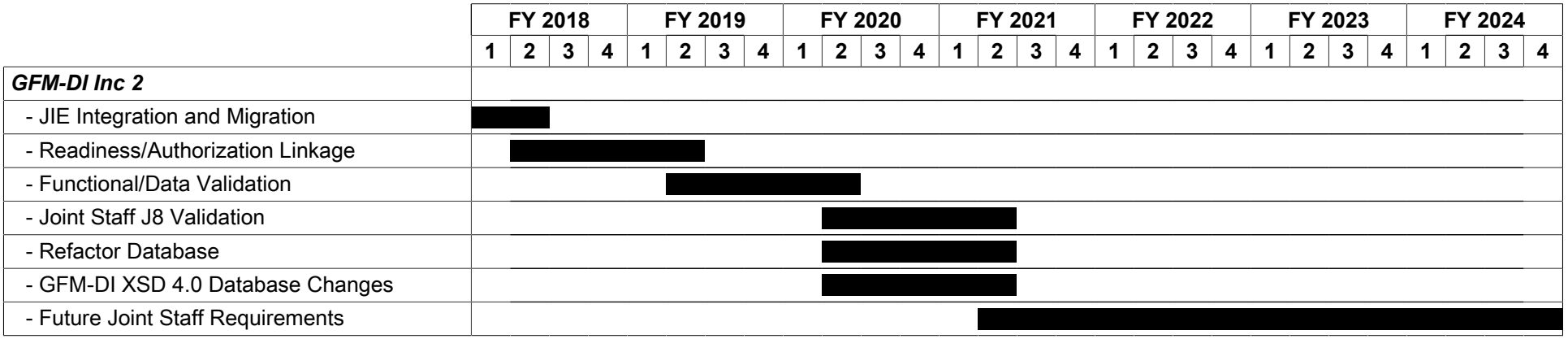

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303142F / *Global Force Management - Data Initiative*	**Project (Number/Name)** 676027 / *Global Force Mgt Initative*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
GFM-DI Inc 2				
- JIE Integration and Migration	1	2018	2	2018
- Readiness/Authorization Linkage	2	2018	2	2019
- Functional/Data Validation	2	2019	2	2020
- Joint Staff J8 Validation	2	2020	2	2021
- Refactor Database	2	2020	2	2021
- GFM-DI XSD 4.0 Database Changes	2	2020	2	2021
- Future Joint Staff Requirements	2	2021	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0304115F / *Multi Domain Command and Control (MDC2)*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	150.880	0.000	150.880	106.400	14.880	14.880	14.880	Continuing	Continuing
673380: *Multi Domain Command and Control (MDC2)*	-	0.000	0.000	150.880	0.000	150.880	106.400	14.880	14.880	14.880	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2020, PE 0304115F, Multi Domain Command and Control (MDC2), Project Number 673380, Multi Domain Command and Control (MDC2), transferred from PE 0207410F, Air & Space Operations Center (AOC), Project Number 674596, AOC WS Modifications, in order to improve transparency of development programs.

A. Mission Description and Budget Item Justification

In FY 2019, Multi-Domain Command and Control (MDC2) Development was a new start in PE 0207410F, AOC, Project Number 674596, AOC WS Mods.

Multi-Domain Command and Control (MDC2) is a multi-node concept which connects existing DevOps environments in order to achieve MDC2 objectives. It serves as a warfighter-centric focal point for USAF-organic rapid software development, experimentation, testing, and operationalization of MDC2 capabilities. It will explore advanced technology and leverage agile acquisition to rapidly operationalize MDC2 tools and capabilities. Experimentation to shape the future MDC2 network capability through data virtualization. The ShadowNet is a multi-node concept unifying software development with operators in order to achieve MDC2 objectives. It serves as a warfighter-centric focal point for USAF, Joint and coalition by rapidly developing capability and testing future multi-domain concepts.

In FY 2020, the Air Force will develop a MDC2 capability to provide warfighters and support elements across all services and domains a common C2 platform from which disparate data sources may be leveraged and cross-domain effects may be synchronized. This common platform expands on the Kessel Run Air Operations Center platform and is undergirded by the creation of an enterprise data lake and an experimentation campaign focused on testing and developing enterprise solutions for the common enablers of data, network, and link capability.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver MDC2 capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, and 0605898F.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0304115F / *Multi Domain Command and Control (MDC2)*

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	150.880	0.000	150.880
Total Adjustments	0.000	0.000	150.880	0.000	150.880
• 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	150.880	0.000	150.880

Change Summary Explanation

FY 2020: Increase includes $14.880M transferred from PE 0207410F, Air & Space Operations Center (AOC), Project Number 674596, AOC WS Modifications and $136M of additional development funding for ShadowNet experimentation, C2 Common Platform and Enterprise Data Lake efforts

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Multi Domain Command and Control (MDC2) Development	0.000	0.000	150.380	0.000	150.380
Description: Development of enduring capability for a scalable operational infrastructure and data architecture to acquire and develop MDC2 capability; procure/lease a virtualized (cloud-based) data structure for all relevant information (mission data, business data, applications, enterprise services, etc.). Experiment, explore, and develop innovative C2 tools designed for multi-domain; multi-level security tools and capabilities to enhance C2 interoperability and data sharing for the 2030 and beyond fight. Utilize for program support and other activities that may include, but are not limited to experiments, infrastructure/architecture needs, coding, technical analysis, etc.					
FY 2019 Plans: See PE 0207410F, Air & Space Operations Center (AOC), Project Number 674596, AOC WS Modifications.					
FY 2020 Base Plans: - Continue to evolve the MDC2 capability through Agile DevOps development, integration, and test of progressively improving capabilities in support of mission requirements					

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0304115F / *Multi Domain Command and Control (MDC2)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
- Conduct ShadowNet experimentation activities supporting MDC2; ShadowNet activities include Enterprise and Data management, operational assessments, and Air, Space, and Cyber hybrid nodes - Develop a common C2 backbone to enable MDC2; expand the capabilities of the Kessel Run platform into a MDC2 common platform in order to facilitate C2 capabilities development for any operational community (e.g., air, space, cyber, Intelligence, Surveillance and Reconnaissance (ISR), logistics, etc.) - Develop an MDC2 Enterprise Data Lake to support a common, relational database for Air Force C2 nodes in air, space, and cyberspace. Builds and updates the relational database to enable C2 nodes to virtualize data sets and support multi domain situation awareness for commanders ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding increased due to transfer from PE 0207410F, Project Number 674596, and additional development efforts for ShadowNet experimentation, C2 Common Platform and Enterprise Data Lake.					
Title: MDC2 Test and Evaluation ***Description:*** MDC2 testing and test support activities. ***FY 2019 Plans:*** See PE 0207410F, Air & Space Operations Center (AOC), Project Number 674596, AOC WS Modifications. ***FY 2020 Base Plans:*** Continue to test operationalization of MDC2 capabilities. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding increased due to transfer from PE 0207410F, Project Number 674596.	0.000	0.000	0.500	0.000	0.500
Accomplishments/Planned Programs Subtotals	0.000	0.000	150.880	0.000	150.880

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0304115F / *Multi Domain Command and Control (MDC2)*

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPAF 03 833140: *Strategic Command And Control*	0.000	0.000	2.000	0.000	2.000	0.000	0.000	0.000	0.000	0.000	2.000

Remarks

E. Acquisition Strategy

Employ advanced technology to rapidly experiment with future MDC2 concepts and capabilities. Inform on data enterprise, network, technical & acquisition policy, industry collaboration and Joint/coalition interoperability decisions. Leverage agile acquisition principles to field C2 systems on an operationally-relevant timeline in support of Multi Domain Operations (MDO).

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0304115F / *Multi Domain Command and Control (MDC2)*	Project (Number/Name) 673380 / *Multi Domain Command and Control (MDC2)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MDC2 Development	Various	Various : Various	-	0.000		0.000		6.880	Apr 2020	-		6.880	Continuing	Continuing	-
MDC2 ShadowNet Experimentation	Various	Various : Various	-	0.000		0.000		36.000	Mar 2020	-		36.000	Continuing	Continuing	-
MDC2 C2 Common Platform	Various	Kessel Run : Hanscom AFB, MA	-	0.000		0.000		60.000	Jan 2020	-		60.000	Continuing	Continuing	-
MDC2 Enterprise Data Lake	Various	Various : Various	-	0.000		0.000		40.000	Apr 2020	-		40.000	Continuing	Continuing	-
		Subtotal	-	0.000		0.000		142.880		-		142.880	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MDC2 Systems Engineering	Various	Various : Various	-	0.000		0.000		5.500	Dec 2019	-		5.500	Continuing	Continuing	-
		Subtotal	-	0.000		0.000		5.500		-		5.500	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MDC2 Test and Evaluation	Various	Various : Hanscom AFB, MA	-	0.000		0.000		0.500	Dec 2019	-		0.500	Continuing	Continuing	-
		Subtotal	-	0.000		0.000		0.500		-		0.500	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MDC2 Program Support Costs (PSC)	Various	Various : Various	-	0.000		0.000		2.000	May 2020	-		2.000	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0304115F / *Multi Domain Command and Control (MDC2)*	**Project (Number/Name)** 673380 / *Multi Domain Command and Control (MDC2)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	0.000		0.000		2.000		-		2.000	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.000		0.000		150.880		-		150.880	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0304115F / *Multi Domain Command and Control (MDC2)*	**Project (Number/Name)** 673380 / *Multi Domain Command and Control (MDC2)*

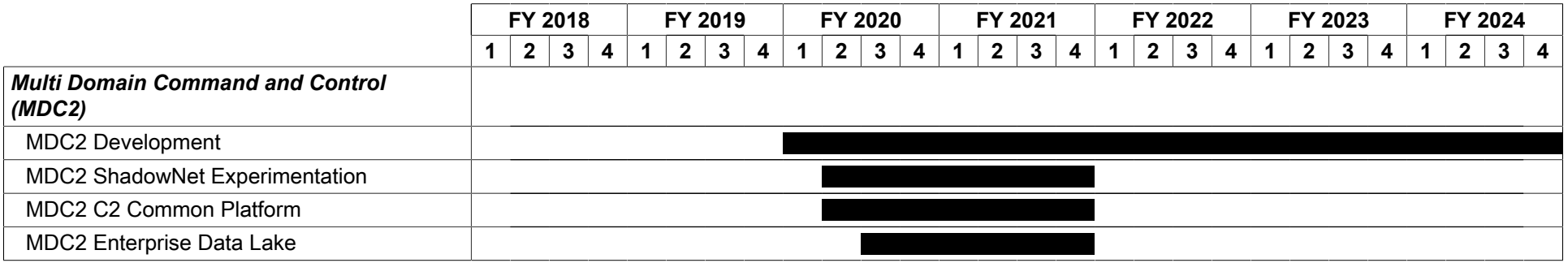

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0304115F / *Multi Domain Command and Control (MDC2)*	**Project (Number/Name)** 673380 / *Multi Domain Command and Control (MDC2)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Multi Domain Command and Control (MDC2)				
MDC2 Development	1	2020	4	2024
MDC2 ShadowNet Experimentation	2	2020	4	2021
MDC2 C2 Common Platform	2	2020	4	2021
MDC2 Enterprise Data Lake	3	2020	4	2021

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0304260F / *Airborne SIGINT Enterprise*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	116.186	109.873	102.667	0.000	102.667	125.782	132.297	131.567	98.114	Continuing	Continuing
675180: *RC-135 (Airborne SIGINT Development - RC-135 Rivet Joint)*	-	60.353	50.577	33.396	0.000	33.396	42.195	43.071	43.856	44.646	Continuing	Continuing
675182: *MQ-1/MQ-9 (Airborne SIGINT Development - Predator)**	-	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.001	0.000	Continuing	Continuing
675183: *Common Development (Airborne SIGINT Development - Common Development)*	-	19.485	54.384	38.613	0.000	38.613	55.568	66.786	64.864	36.244	Continuing	Continuing
675185: *Non-Traditional SIGINT (NTS)*	-	11.654	0.000	23.289	0.000	23.289	20.521	14.785	15.054	9.292	Continuing	Continuing
675186: *Special Programs (Airborne SIGINT Development - Special Platforms)*	-	24.694	4.912	7.369	0.000	7.369	7.498	7.653	7.792	7.932	Continuing	Continuing

*This project's R-2a exhibit has been suppressed due to funding not beginning until after FY 2020

A. Mission Description and Budget Item Justification

This Program provides signals intelligence (SIGINT) development efforts for all USAF airborne platforms. The funds in this Program are distributed among all Airborne SIGINT Enterprise (ASE) projects based on the development priorities established by the USAF SIGINT Capabilities Working Group (SCWG) in order to build a total SIGINT capability. As a result, the USAF will move funds between projects periodically to develop the highest priority projects in response to urgent and emerging warfighter needs. This program will participate in the development, integration, testing, and implementation of international and Air Force standards (to include North Atlantic Treaty Organization (NATO) standardization agreements) to ensure joint, allied, and coalition interoperability. Modernization efforts include sensors for the platforms and where appropriate, their interfaces with the Air Force Distributed Common Ground System (AF DCGS). This approach supports a synergistic development effort providing a true Air Force-wide capability.

This enterprise will use the Air Force SIGINT Architecture (AFSA) for planning and decision-making and, in turn, employ open architecture standards whenever possible to allow maximum ease of future upgrades and system interoperability. The primary goal of the ASE is to produce an architecture-based, capability-focused SIGINT investment strategy for the USAF. Funds in any project may be used to fund initiatives in other projects within this Program at the discretion of the SCWG.
Funds in any project can also cover activities to include studies and analysis to support both current program planning and execution and future program planning.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0304260F / *Airborne SIGINT Enterprise*

This program element may include necessary civilian pay expenses required to manage, execute, and deliver technology and sensor capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	121.948	106.873	127.439	0.000	127.439
Current President's Budget	116.186	109.873	102.667	0.000	102.667
Total Adjustments	-5.762	3.000	-24.772	0.000	-24.772
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	-6.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	3.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.238	0.000	-24.772	0.000	-24.772

Change Summary Explanation

In FY 2018, 0304260F PE received -$6.0M Congressional Reductions for Non-Traditional SIGINT unjustified growth.

In FY 2019, ASE PE received $3.0M Increase for U-2 Single Pod Development

In FY 2020, ASE PE received a total of -$24.772M ($7.3M for RC-135 BPAC and $17.472M for Common Development BPAC) reduction for support of higher Air Force priorities

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0304260F / *Airborne SIGINT Enterprise*	Project (Number/Name) 675180 / *RC-135 (Airborne SIGINT Development - RC-135 Rivet Joint)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675180: *RC-135 (Airborne SIGINT Development - RC-135 Rivet Joint)*	-	60.353	50.577	33.396	0.000	33.396	42.195	43.071	43.856	44.646	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project supports design studies, engineering analysis, non-recurring engineering, and other efforts associated with the integration and modification of the RC-135 SIGINT sensors and their associated air and ground components. Through extensive utilization of commercial-off-the-shelf (COTS) based solutions to field needed capabilities, it also incurs a need for continuous identification of suitable replacements for components affected by Diminishing Manufacturing Sources and integration efforts consistent with the COTS technology cycle. These efforts provide required engineering for preliminary assessments of technical feasibility, operability, or military utility as well as specific engineering implementations integrated into the various baseline modifications. These funds will be split between the RC-135V/W RIVET JOINT, the RC-135U COMBAT SENT, and the RC-135S COBRA BALL programs. Funding reflects the SCWG priorities and the accomplishment of other Airborne SIGINT Enterprise initiatives.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: RC-135 SIGINT Development	60.353	50.577	33.396
Description: Non-Recurring Engineering for the RC-135 signals intelligence Systems. See Classified Budget Exhibits (PE 0305207F) ***FY 2019 Plans:*** - Continue SIGINT development efforts for the RC-135 fleet to include new signal sets and upgrades to current capabilities. ***FY 2020 Plans:*** - Will continue SIGINT development efforts for the RC-135 fleet to include new signal sets and upgrades to current capabilities. See PE 0305207F for classified details. Classified requirements POC is HAF AF/A2OO (704) 614-7317. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding decreased from FY19 to FY20 was caused by a requirement decrease for new signal sets and reduced number of upgrades to the RC-135 fleet for SIGINT development.			
Accomplishments/Planned Programs Subtotals	60.353	50.577	33.396

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0304260F / *Airborne SIGINT Enterprise*	**Project (Number/Name)** 675180 / *RC-135 (Airborne SIGINT Development - RC-135 Rivet Joint)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APAF 05 Line Item DARP01: *RC-135*	280.734	234.706	239.037	-	239.037	243.443	248.318	252.788	-	Continuing	Continuing

Remarks

The funds within Program 0305207F procure all necessary aircraft modifications for the RC-135 program and include those funds necessary to field SIGINT capabilities developed under Project 675180 of the ASE. Not all procurement funds in #DARPO1: RC-135 are for ASE SIGINT projects.

D. Acquisition Strategy

Aircraft, aircraft sensor systems, and associated ground support system modifications planned include the procurement, fielding and logistical support for future RC-135V/W RIVET JOINT, RC-135U COMBAT SENT and RC-135S COBRA BALL baseline configurations. Development and integration is managed by the Big Safari Systems Group. They employ evolutionary acquisition approaches to field incremental capability improvements.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0304260F / *Airborne SIGINT Enterprise*	**Project (Number/Name)** 675180 / *RC-135 (Airborne SIGINT Development - RC-135 Rivet Joint)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
RC-135 SIGINT Development	SS/ Various	L3COM : Greenville, TX	-	60.353	Jan 2018	50.577	Jan 2019	33.396	Jan 2020	-		33.396	Continuing	Continuing	-
		Subtotal	-	60.353		50.577		33.396		-		33.396	Continuing	Continuing	N/A

Remarks

Above contract method/type will be CPFF and FFP

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	60.353		50.577		33.396		-		33.396	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0304260F / *Airborne SIGINT Enterprise*	**Project (Number/Name)** 675180 / *RC-135 (Airborne SIGINT Development - RC-135 Rivet Joint)*

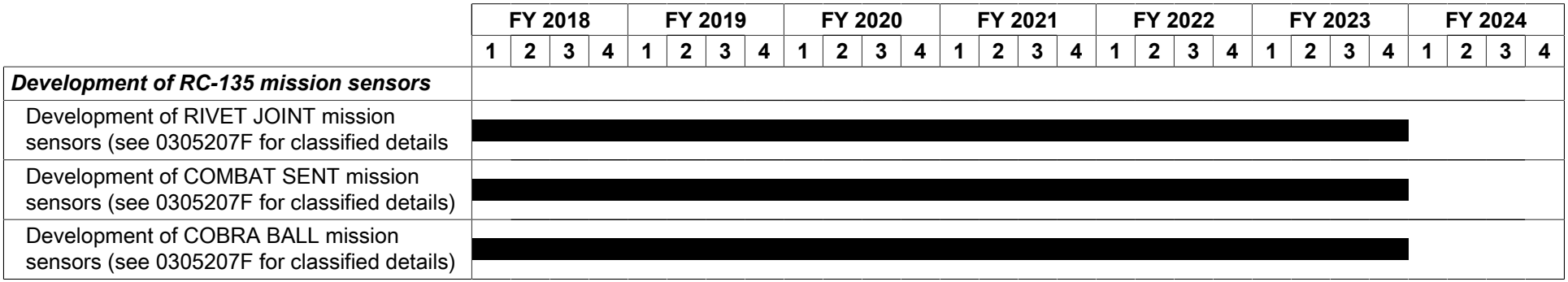

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0304260F / *Airborne SIGINT Enterprise*	**Project (Number/Name)** 675180 / *RC-135 (Airborne SIGINT Development - RC-135 Rivet Joint)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Development of RC-135 mission sensors				
Development of RIVET JOINT mission sensors (see 0305207F for classified details	1	2018	4	2023
Development of COMBAT SENT mission sensors (see 0305207F for classified details)	1	2018	4	2023
Development of COBRA BALL mission sensors (see 0305207F for classified details)	1	2018	4	2023

Note

Requirements documentation is classified. Classified requirements POC is HAF AF/A2OO (704) 614-7317

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0304260F / *Airborne SIGINT Enterprise*	Project (Number/Name) 675183 / *Common Development (Airborne SIGINT Development - Common Development)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675183: *Common Development (Airborne SIGINT Development - Common Development)*	-	19.485	54.384	38.613	0.000	38.613	55.568	66.786	64.864	36.244	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project supports design studies, engineering analysis, non-recurring engineering, program management administration and other efforts associated with the insertion of new capabilities integrated into Airborne Signals Intelligence Payload (ASIP) and other sensors and their associated air and ground components that will be used on/by more than one platform. The common development SIGINT project also supports development of new sensors capabilities, normalization of quick reaction capabilities, and develops replacement components affected by Diminishing Manufacturing Sources and Material Shortages (DMSMS). New capabilities are developed by separate efforts. This project also supports the development of efforts common to the Airborne SIGINT Enterprise Program overall to include, but not limited to: the Air Force SIGINT Architecture maintenance, modeling and simulation efforts, and NATO SIGINT efforts.

Development supports ASIP system upgrades and potential follow-on sensors. The ASIP sensor is designed to be a common SIGINT system, allowing for maximum coverage of the electromagnetic spectrum through the use of an integrated high and low band system. Follow-on objectives include but are not limited to use of open architecture concepts and rapid integration of new signals of interests.

Capability improvements will be inserted into the ASIP sensor through individual development efforts to exploit signals of interest identified as service priorities by the Air Force SCWG. This project provides the warfighter near term increased combat capability. Enhancements are implemented as soon as technology and risk achieve satisfactory levels. Compatibility improvements will be inserted into the ASIP through individual development efforts to exploit signals of interest identified as Service priorities by the USAF SCWG. Sensors will be integrated and tested on the various platforms as funding permits.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver SIGINT sensor capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Airborne Signals Intelligence Payload	19.485	54.384	38.613
Description: Develop and test a common SIGINT system for multiple SIGINT platforms including ASIP incremental upgrades using an open system architecture to the maximum extent possible.			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0304260F / *Airborne SIGINT Enterprise*	**Project (Number/Name)** 675183 / *Common Development (Airborne SIGINT Development - Common Development)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY 2019 Plans: - Continue new signals capabilities and enhancements for the ASIP Family of Systems (FoS). - Continue integration activities and incorporate upgrades as appropriate. Details are classified. - Continue to develop replacement components affected by DMSMS. - Continue to evaluate options for expected follow-on open architecture systems. - Begin new sensor development activities. ***FY 2020 Plans:*** - Will continue new signals capabilities and enhancements for the ASIP FoS. - Will continue integration activities and incorporate upgrades as appropriate. Details are classified. - Will continue to develop replacement components affected by DMSMS. - Will continue to evaluate options for expected follow-on open architecture systems. - Will continue new sensor development activities. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease for support of higher Air Force priorities.			
Accomplishments/Planned Programs Subtotals	19.485	54.384	38.613

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APAF 05 Line Item HAWK00: *RQ-4 Mods*	43.968	23.715	4.851	-	4.851	126.340	117.382	106.166	-	167.265	589.687
• RDTE 07 0305202F: *Dragon U-2*	14.714	0.520	0.550	-	0.550	1.840	3.920	0.000	-	0.000	21.544

Remarks

Not all Other Program Funding is associated with SIGINT.

D. Acquisition Strategy

SIGINT capabilities will be developed and integrated onto various platforms using an incremental acquisition approach. In response to requirements as validated by the SCWG, an incremental acquisition strategy plan will be executed, contracting with appropriate vendor(s) to deliver capability while encouraging competition where possible. In response to SCWG-validated requirements, a competitive acquisition approach is expected for a follow-on system.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0304260F / *Airborne SIGINT Enterprise*	**Project (Number/Name)** 675183 / *Common Development (Airborne SIGINT Development - Common Development)*

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0304260F / *Airborne SIGINT Enterprise*	**Project (Number/Name)** 675183 / *Common Development (Airborne SIGINT Development - Common Development)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ASIP Global Hawk Increment 1	SS/CPFF	Northrop Grumman : San Jose, CA	-	2.948	Dec 2017	4.175	Jan 2019	-		-		-	Continuing	Continuing	-
ASIP Increment 2 - Build A	SS/CPIF	Northrop Grumman : San Jose, CA	-	6.747	Aug 2019	16.282	Aug 2019	1.200	Dec 2019	-		1.200	Continuing	Continuing	-
Ground Station	Various	Various : Various	-	1.850	Jul 2018	-		-		-		-	Continuing	Continuing	-
Follow-on System Development (Post Inc 2 Build A)	Various	Various : Various	-	2.000	Jun 2018	6.200	May 2019	2.500	Jan 2020	-		2.500	Continuing	Continuing	-
Follow-on SIGINT Sensors	TBD	Various : Various	-	0.150	Aug 2018	17.510	Sep 2019	25.312	Mar 2020	-		25.312	Continuing	Continuing	-
Various SIGINT Efforts	Various	AECOM : Annapolis Junction, MD	-	4.000	Nov 2017	4.000	Nov 2018	4.000	Nov 2019	-		4.000	Continuing	Continuing	-
		Subtotal	-	17.695		48.167		33.012		-		33.012	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Various integration efforts and flight test	Various	Various : Various	-	0.706	Dec 2017	0.662	Dec 2018	-		-		-	Continuing	Continuing	-
		Subtotal	-	0.706		0.662		-		-		-	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation Support	Various	Various : Various	-	-		-		-		-		-	Continuing	Continuing	-
		Subtotal	-	-		-		-		-		-	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0304260F / *Airborne SIGINT Enterprise*	**Project (Number/Name)** 675183 / *Common Development (Airborne SIGINT Development - Common Development)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMA	Various	Various : Dayton, OH	-	1.084	Nov 2017	5.555	Nov 2018	5.601	Nov 2019	-		5.601	Continuing	Continuing	-
		Subtotal	-	1.084		5.555		5.601		-		5.601	Continuing	Continuing	N/A

Remarks

FY18 PMA: lower costs were due to rephasing the funds to support the period of performance.

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	19.485		54.384		38.613		-		38.613	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0304260F / *Airborne SIGINT Enterprise*	**Project (Number/Name)** 675183 / *Common Development (Airborne SIGINT Development - Common Development)*

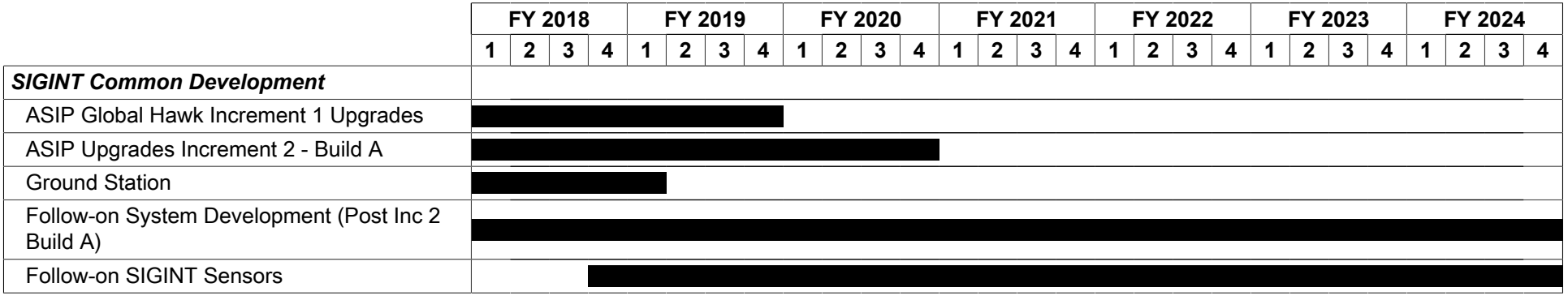

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0304260F / *Airborne SIGINT Enterprise*	**Project (Number/Name)** 675183 / *Common Development (Airborne SIGINT Development - Common Development)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
SIGINT Common Development				
ASIP Global Hawk Increment 1 Upgrades	1	2018	4	2019
ASIP Upgrades Increment 2 - Build A	1	2018	4	2020
Ground Station	1	2018	1	2019
Follow-on System Development (Post Inc 2 Build A)	1	2018	4	2024
Follow-on SIGINT Sensors	4	2018	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0304260F / *Airborne SIGINT Enterprise*	Project (Number/Name) 675185 / *Non-Traditional SIGINT (NTS)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675185: *Non-Traditional SIGINT (NTS)*	-	11.654	0.000	23.289	0.000	23.289	20.521	14.785	15.054	9.292	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

COMPASS BRIGHT develops, demonstrates, and rapidly transitions advanced Air Force specific SIGINT capabilities against emerging and future target signals of interest. This program pursues SIGINT technologies for program transition, to include Communications Intelligence (COMINT), Electronic Intelligence (ELINT), Audio, Analytics, Special Signals of Interest, and Radio Frequency Measurement and Signature Intelligence (MASINT). The COMPASS BRIGHT program objective is to develop technologies for application in SIGINT and MASINT systems or subsystems. Acquisition and production of these developed technologies will occur within the appropriate platform programs. COMPASS BRIGHT projects are selected through a data call process, whereby the USAF evaluates proposals from the laboratories, platforms, and other government agencies, to select those projects that are most promising.

Operational Reconnaissance (Ops Recce) is part of the initiative to improve overall USAF intelligence, surveillance, and reconnaissance (ISR) capability through development and use of sensor data from non-ISR platforms and innovative use of sensors. This program pursues Ops Recce capabilities for transition through development, testing, demonstration and implementation efforts across all platforms. The Ops Recce program objective is to provide increased battlespace awareness through the use of sensors/platforms to achieve effects beyond what those sensor/platforms were originally designed.

The program office authority extends to accomplishment of out-of-cycle, nontraditional SIGINT (NTISR) efforts. These tasks may be filtered through the SIGINT Capability Working Group (SCWG) outside the normal vetting process to expedite acquisition of high-end capabilities for the warfighter.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver technology and sensor capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F,0605898F, and 0605833F.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Non-Traditional SIGINT Tech Development	11.654	0.000	23.289
Description: Develops projects in the SIGINT and MASINT areas for transition to the RC-135 fleet, other intelligence, surveillance, and reconnaissance platforms and Ops Recce.			
FY 2019 Plans: N/A			
FY 2020 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0304260F / *Airborne SIGINT Enterprise*	**Project (Number/Name)** 675185 / *Non-Traditional SIGINT (NTS)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Will initiate, continue, and complete various SIGINT projects to include enhanced ELINT exploitation, COMINT, Audio exploitation, Ops Recce, signals of interest prosecution, and NTISR. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY20 Non-Traditional SIGINT increased to right-sized program support levels with payback to support Compass Bright and Ops Recce.			
Accomplishments/Planned Programs Subtotals	11.654	0.000	23.289

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APAF 05 Line Item DARP01: *RC-135*	280.734	234.706	239.037	-	239.037	243.443	248.318	252.788	-	Continuing	Continuing

Remarks

Not all funds are associated with SIGINT.

D. Acquisition Strategy

Air Force Life Cycle Management Center/Intelligence, Surveillance, and Reconnaissance and Special Operations Forces Directorate (AFLCMC/WI) will execute COMPASS BRIGHT and Operational Reconnaissance efforts through technology development and demonstration contracts which leverage existing laboratory relationships and other existing contractual vehicles, with future development projects emphasizing full and open competition.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0304260F / *Airborne SIGINT Enterprise*	**Project (Number/Name)** 675185 / *Non-Traditional SIGINT (NTS)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Non Traditional SIGINT Tech Development	Various	Multiple : Various	-	9.654	Dec 2017	-		17.789	Jan 2020	-		17.789	Continuing	Continuing	-
Ops Recce	Various	Multiple : Various	-	1.600	Dec 2017	-		4.000	Jan 2020	-		4.000	Continuing	Continuing	-
		Subtotal	-	11.254		-		21.789		-		21.789	Continuing	Continuing	N/A

Remarks

On an annual basis, the SIGINT Capabilities Working Group (SCWG) reviews developmental technologies against warfighter capabilities and requirements based on strategic roadmaps. Projects advancing the technological maturity of promising sensors and processing capabilities are reviewed and prioritized into a recommended list for senior executive direction to implement for the coming fiscal year.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMA	Various	Various : Various, OH	-	0.400	Oct 2018	-		1.500	Oct 2019	-		1.500	Continuing	Continuing	-
		Subtotal	-	0.400		-		1.500		-		1.500	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	11.654		0.000		23.289		-		23.289	Continuing	Continuing	N/A

Remarks

FY20 Non-Traditional SIGINT increased to right-sized program support levels with payback to support Compass Bright and Ops Recce.

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0304260F / *Airborne SIGINT Enterprise*	**Project (Number/Name)** 675185 / *Non-Traditional SIGINT (NTS)*

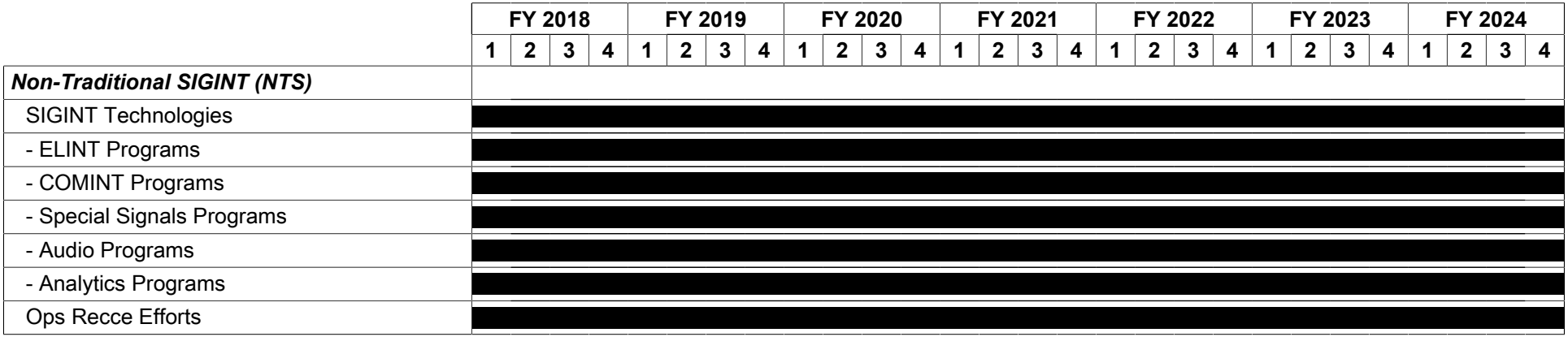

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0304260F / *Airborne SIGINT Enterprise*	**Project (Number/Name)** 675185 / *Non-Traditional SIGINT (NTS)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Non-Traditional SIGINT (NTS)				
SIGINT Technologies	1	2018	4	2024
- ELINT Programs	1	2018	4	2024
- COMINT Programs	1	2018	4	2024
- Special Signals Programs	1	2018	4	2024
- Audio Programs	1	2018	4	2024
- Analytics Programs	1	2018	4	2024
Ops Recce Efforts	1	2018	4	2024

Note

On an annual basis, the SCWG reviews developmental technologies against warfighter capabilities and requirements based on strategic roadmaps. Projects advancing the technological maturity of promising sensors and processing capabilities are reviewed and prioritized into a recommended list for senior executive direction to implement for the coming fiscal year. As a result, the USAF will move funds between projects periodically to develop the highest priority projects in response to urgent and emerging warfighter needs.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0304260F / *Airborne SIGINT Enterprise*	Project (Number/Name) 675186 / *Special Programs (Airborne SIGINT Development - Special Platforms)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675186: *Special Programs (Airborne SIGINT Development - Special Platforms)*	-	24.694	4.912	7.369	0.000	7.369	7.498	7.653	7.792	7.932	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project supports special SIGINT studies as well as the development and integration of advanced SIGINT capabilities for special programs including, but not limited to: quick reaction capability sensors, the processing, exploitation, and dissemination associated with these systems, and other efforts approved by the USAF SCWG. Development efforts will include, but are not limited to: new signal sets, antenna improvements, sensitivity upgrades, and data distribution upgrades, and new/advanced deployment capabilities. This project provides the warfighter with near term combat capabilities with increased capability improvements accomplished as technologies and risks achieve satisfactory levels. Sensors will be integrated and tested on various platforms including the MQ-1B/MQ-9A remotely piloted aircraft as funding permits.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: SIGINT Development	24.694	4.912	7.369
Description: Develop, update, and test SIGINT capabilities for QRC and normalized special programs SIGINT projects. ***FY 2019 Plans:*** -Will continue to modernize SIGINT systems used by the MQ-1B/9A RPA. ***FY 2020 Plans:*** - Will continue to modernize SIGINT systems used by the MQ-1B/9A RPA. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** - Funding increase in FY20 reflects slightly increased quick reaction capability upgrade requirements, which is consistent with future funding requests.			
Accomplishments/Planned Programs Subtotals	24.694	4.912	7.369

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0304260F / *Airborne SIGINT Enterprise*	**Project (Number/Name)** 675186 / *Special Programs (Airborne SIGINT Development - Special Platforms)*

D. Acquisition Strategy

SIGINT capabilities will be integrated to various classified platforms using an evolutionary acquisition approach. Capabilities and prototypes will be developed by Other Government Agencies and transitioned to select vendors as production needs develop.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0304260F / *Airborne SIGINT Enterprise*	**Project (Number/Name)** 675186 / *Special Programs (Airborne SIGINT Development - Special Platforms)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Upgrades to SIGINT systems used by the MQ-1/9 Rremotely piloted aircraft	Various	Various : Various	-	23.914	Jan 2018	4.000	Jan 2019	7.369	Jan 2020	-		7.369	Continuing	Continuing	-
		Subtotal	-	23.914		4.000		7.369		-		7.369	Continuing	Continuing	N/A

Remarks

Upgrades the quick reaction capability sensors already on the MQ-1/9 fleet

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Flight Test	Various	Various : Various	-	0.780	May 2017	0.912	May 2018	-		-		-	Continuing	Continuing	-
		Subtotal	-	0.780		0.912		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	24.694		4.912		7.369		-		7.369	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0304260F / *Airborne SIGINT Enterprise*	**Project (Number/Name)** 675186 / *Special Programs (Airborne SIGINT Development - Special Platforms)*

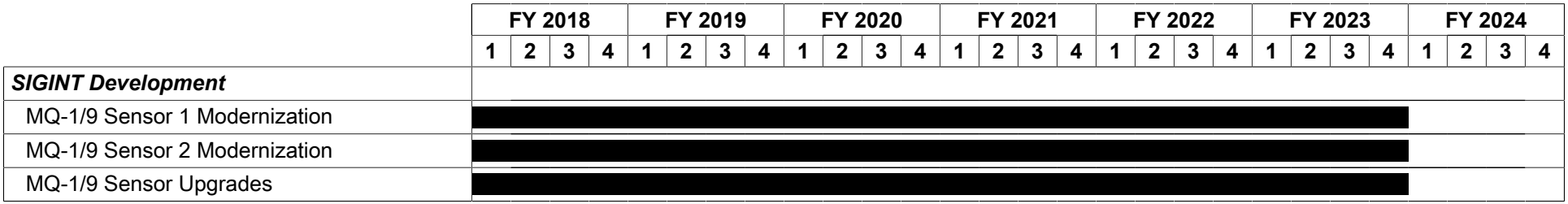

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0304260F / *Airborne SIGINT Enterprise*	**Project (Number/Name)** 675186 / *Special Programs (Airborne SIGINT Development - Special Platforms)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
SIGINT Development				
MQ-1/9 Sensor 1 Modernization	1	2018	4	2023
MQ-1/9 Sensor 2 Modernization	1	2018	4	2023
MQ-1/9 Sensor Upgrades	1	2018	4	2023

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0304310F / *Commercial Economic Analysis*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	3.544	3.472	3.431	0.000	3.431	4.049	4.384	4.464	4.544	Continuing	Continuing
675896: *Commercial Economic Analysis*	-	3.544	3.472	3.431	0.000	3.431	4.049	4.384	4.464	4.544	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

To preserve Air Force and DoD military advantage from commercial and economic risk, the Office of Commercial Economic Analysis (OCEA) produces in-depth analytical assessments and advanced risk mitigation strategies based on commercially available industry, market, and economic information. These assessments and strategies support the decision making efforts of Service, Department of Defense, and Whole of Government to protect National Security Innovation Base equities and sustain the U.S. competitive advantage.

The funding request provides for an enterprise analytic platform providing a technical prototype which will aggregate risk data and produce mitigation strategies and impact analytic products, i.e. mature big data architecture, higher domain connectivity, continuous assessment capability and integrate external applications. The funding also supports continuous assessment of the commercially available information to ensure it is accurate, current, and relevant.

The FY 2020 funding request was reduced by $.319 million to account for the availability of prior year execution balances.

Additional classified details can be found in OSD Comptroller's classified Justification Book Volume 6.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0304310F / *Commercial Economic Analysis*

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	3.544	3.472	3.750	0.000	3.750
Current President's Budget	3.544	3.472	3.431	0.000	3.431
Total Adjustments	0.000	0.000	-0.319	0.000	-0.319
• 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	-0.319	0.000	-0.319

Change Summary Explanation

FY19 to FY20 funding decreased to account for the availability of prior year execution balances.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Commercial Economic Analysis	3.544	3.472	3.431

Description: Develop solutions to help protect the National Security Innovation Base from adversary information attacks and protect the U.S. technological advantage. Research, develop, test and evaluate Commercial Economic Analysis capabilities, systems, tools, data, products, and services through a disciplined, yet agile, process that ensures commercial economic modeling pilots, risk management constructs, decision support tools, and continuous monitoring capabilities are available for Air Force sectors and segments of the National Security Innovation Base.

Additional classified details can be found in OSD Comptroller's classified Justification Book Volume 6.

FY 2019 Plans:

Utilize existing contracts for continuation of modular components, develop big data architecture, connect to higher domain, perform continuous assessment, and integrate external applications.

Additional classified details can be found in OSD Comptroller's classified Justification Book Volume 6.

FY 2020 Plans:

Utilize existing contracts for continuation of modular components and data architecture framework supporting risk management, risk mitigation and nontraditional support capabilities.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0304310F / *Commercial Economic Analysis*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Additional classified details can be found in OSD Comptroller's classified Justification Book Volume 6. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding decreased to account for the availability of prior year execution balances.			
Accomplishments/Planned Programs Subtotals	3.544	3.472	3.431

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• O&M Enter custom abbreviation here.: *0304310F/ Commercial Economic Analysis*	0.868	23.738	17.289	-	17.289	18.718	20.316	20.688	21.070	Continuing	Continuing

Remarks

N/A

E. Acquisition Strategy

Pursue competitively awarded contracts for follow-on to existing contract and task orders, with emphasis on system integration and corresponding data architectures. IDIQ task orders and specific system integration, cloud connectivity, and data contracts are the cornerstone of OCEA RDT&E activities.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0304310F / *Commercial Economic Analysis*	**Project (Number/Name)** 675896 / *Commercial Economic Analysis*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Enterprise Architecture and Data Integration	SS/CPIF	Novetta : McLean, VA	-	2.116	Sep 2018	3.472	Oct 2018	-		-		-	Continuing	Continuing	-
Analytic and Technical Services follow-on	C/TBD	TBD : TBD	-	-		-		2.548	Jan 2020	-		2.548	Continuing	Continuing	-
		Subtotal	-	2.116		3.472		2.548		-		2.548	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FFRDC	SS/FFP	MITRE : McLean, VA	-	0.865	Aug 2018	0.000		0.320	Oct 2019	-		0.320	Continuing	Continuing	-
Hosting Services	SS/FFP	AWS (C2S) : Seattle, WA	-	0.563	Nov 2018	-		0.563	Nov 2019	-		0.563	Continuing	Continuing	-
		Subtotal	-	1.428		0.000		0.883		-		0.883	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
N/A	TBD	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-
		Subtotal	-	-		-		-		-		-	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
N/A	TBD	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-
		Subtotal	-	-		-		-		-		-	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0304310F / *Commercial Economic Analysis*	Project (Number/Name) 675896 / *Commercial Economic Analysis*	

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	3.544		3.472		3.431		-		3.431	Continuing	Continuing	N/A

Remarks

Product Development: Follow-on Analytic and Technical Services IDIQ contract will replace existing Enterprise Architecture and Data Integration contract in FY20.

Product Development: FY19 delay in award of Enterprise Architecture and Data Integration vehicle to 4th QTR FY18 resulted in incremental funding in 1st QTR FY19.

Support: FY19 FFRDC and Hosting Services contracts were renewed in 4th QTR FY18 resulting in no FY19 contracts however, a projected contract award is scheduled for 1st QTR FY20 for these continuing efforts.

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0304310F / *Commercial Economic Analysis*	**Project (Number/Name)** 675896 / *Commercial Economic Analysis*

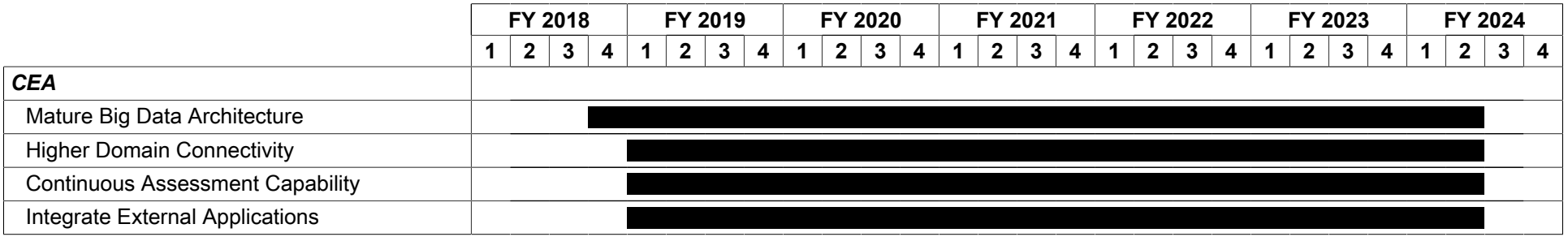

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0304310F / *Commercial Economic Analysis*	**Project (Number/Name)** 675896 / *Commercial Economic Analysis*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
CEA				
Mature Big Data Architecture	4	2018	2	2024
Higher Domain Connectivity	1	2019	2	2024
Continuous Assessment Capability	1	2019	2	2024
Integrate External Applications	1	2019	2	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305015F / *C2 Air Operations Suite - C2 Info Services*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	0.000	8.608	9.313	0.000	9.313	7.873	8.036	8.182	8.329	Continuing	Continuing
675218: *Applications Development*	-	0.000	7.596	6.780	0.000	6.780	7.873	8.036	8.182	8.329	Continuing	Continuing
675220: *Unit Level*	-	0.000	1.012	2.533	0.000	2.533	0.000	0.000	0.000	0.000	0.000	3.545

A. Mission Description and Budget Item Justification

Command and Control (C2) Air Operations Suite - C2 Information Services (C2AOS-C2IS) funds operational development necessary to acquire and modify segments of Air Force's (AF) C2 capabilities and services. Applications Development provides worldwide operational capabilities for AF C2 in support of DoD, Coalition Partners, and other government agencies. These efforts focus on support of the Joint Forces Air Component Commander (JFACC) that provides air, space and cyber support as presented to the AOC and to other AF and Joint Services C2 systems. Applications Development efforts deliver capabilities identified in the Joint Command and Control (JC2) Capability Development Document (CDD) (2013). These activities include C2AOS-C2IS needs identified in the Capability Definition Package (CDP) (2012).

Applications Development: C2AOS-C2IS creates web-enabled information services to expose air operations data using standardized schemas, such as those developed by the Air Operations Community of Interest. C2AOS-C2IS also develops and matures net-centric C2 applications for air battle planning, execution, and management functions. These applications include Network Enabled Weapons (NEW); the remainder of the CDP and Theater Battle Management Core Systems - Force Level (TBMCS FL) functionality; services to support air mission and Friendly Order of Battle execution, Alerting, Publish and Subscribe, Content Management and Reporting; and integration with a JC2 Reference Architecture (RA) host infrastructure environment.

Unit Level: Command and Control, Incident Management, Emergency Response Application (C2IMERA; formerly Unit Command and Control [UC2]) funds develop and integrate C2IMERA as an evolving sequence of increasing software capabilities that support a wing commander's ability to track base level resources, incident management, and provide a real time Common Operating Picture. All in all enabling a commander to have total situational awareness during peace and wartime operations. C2IMERA operations software systems addresses needs identified in the TBMCS Operational Requirements Document (ORD) (2001), the UC2 Baseline System Requirements Document (SRD), and AF Form 1067, Modification Proposal, requirements documents. C2IMERA is utilizing Agile Software Development and Operations (DevOps) methodology by directly soliciting user feedback for improvements to the software. C2IMERA is fielded to Wing Operations Centers (WOC), the Maintenance Operations Centers (MOC), the Emergency Operations Centers (EOC), Crisis Action Teams (CAT), and many other work-centers across multiple MAJCOMs with plans to expand for use as an AF wide application.

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

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305015F / *C2 Air Operations Suite - C2 Info Services*

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	0.000	8.608	7.813	0.000	7.813
Current President's Budget	0.000	8.608	9.313	0.000	9.313
Total Adjustments	0.000	0.000	1.500	0.000	1.500
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	1.500	0.000	1.500

Change Summary Explanation

FY 2020: Funding increased $1.5M to support further Unit Level project development efforts.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305015F / *C2 Air Operations Suite - C2 Info Services*	Project (Number/Name) 675218 / *Applications Development*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675218: *Applications Development*	-	0.000	7.596	6.780	0.000	6.780	7.873	8.036	8.182	8.329	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project funds operational development necessary to acquire and modify segments of Air Force's (AF) Command and Control (C2) capabilities and services. Applications Development provides worldwide operational capabilities for AF C2 in support of DoD, Coalition Partners, and other government agencies. These efforts focus on support of the Joint Forces Air Component Commander (JFACC) that provides air, space and cyber support as presented to the AOC and to other AF and Joint Services C2 systems. Application Development efforts deliver capabilities identified in the Joint Command and Control (JC2) Capability Development Document (CDD) (2013). These activities include C2 Air Operations Suite - C2 Information Services (C2AOS-C2IS) needs identified in the Capability Definition Package (CDP) (2012). C2AOS-C2IS creates web-enabled information services to expose air operations data using standardized schemas, such as those developed by the Air Operations Community of Interest. C2AOS-C2IS also develops and matures net-centric C2 applications for air battle planning, execution, and management functions. These applications include Network Enabled Weapons (NEW); the remainder of the CDP and Theater Battle Management Core Systems - Force Level (TBMCS FL) functionality; services to support air mission and Friendly Order of Battle execution, Alerting, Publish and Subscribe, Content Management and Reporting; and integration with a JC2 Reference Architecture (RA) host infrastructure environment.

In FY 2020, Applications Development (C2AOS-C2IS) will be focused on Agile Software Development and Operations (DevOps) to more quickly retire TBMCS FL and provide needed capability for inclusion in the Air Operations Center (AOC) Weapon System Modifications effort. Additionally in FY 2020, this effort will investigate and develop a solution to address joint partner and non-AOC usage of C2AOS-C2IS in the Agile DevOps framework.

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

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: C2AOS-C2IS Development	0.000	6.946	6.130	0.000	6.130
Description: Conduct C2AOS-C2IS development and integration using FY16 NDAA, Sec 804 rapid prototyping authority. Develop a solution to address joint partner and non-AOC usage of C2AOS-C2IS in the Agile DevOps framework.					
FY 2019 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305015F / *C2 Air Operations Suite - C2 Info Services*	**Project (Number/Name)** 675218 / *Applications Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
- Evolve C2AOS-C2IS through Agile DevOps development, integration and test to reach Minimum Viable Product (MVP) - Refactor C2AOS-C2IS applications to a format usable in the AOC WS Modifications effort - Investigate a solution to address joint partner and non-AOC usage of C2AOS-C2IS in the Agile DevOps framework ***FY 2020 Base Plans:*** - Deliver software to AOC WS Modifications to fully retire TBMCS FL and the Master Air Attack Plan Tool Kit - Develop and deploy C2AOS-C2IS to joint partner and non-AOC entities ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding decreased due to current program ramp down.					
Title: C2AOS-C2IS Test and Evaluation ***Description:*** Agile Test and Evaluation ***FY 2019 Plans:*** - Conduct continuous product and cyber testing (e.g., unit, integration and performance) on Agile DevOps framework - Integrate test agencies into Agile DevOps environment to accelerate testing activities ***FY 2020 Base Plans:*** - Continue to conduct continuous product and cyber testing (e.g., unit, integration and performance) on Agile DevOps framework ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A	0.000	0.650	0.650	0.000	0.650
Accomplishments/Planned Programs Subtotals	0.000	7.596	6.780	0.000	6.780

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305015F / *C2 Air Operations Suite - C2 Info Services*	**Project (Number/Name)** 675218 / *Applications Development*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The acquisition strategy builds on agile development and modification of existing capabilities using evolutionary acquisition to standardize and modernize C2AOS-C2IS. C2AOS-C2IS modifications will operate under FY16 NDAA, Section 804, Middle Tier of Acquisition for Rapid Prototyping and Rapid Fielding, leveraging commercial best practices to fully retire TBMCS FL.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305015F / *C2 Air Operations Suite - C2 Info Services*	**Project (Number/Name)** 675218 / *Applications Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
C2AOS-C2IS Development	C/CPFF	Raytheon : Waltham, MA	-	0.000		3.200	Mar 2019	3.002	Mar 2020	0.000		3.002	Continuing	Continuing	-
C2AOS-C2IS Other Transaction (OT)	Various	Pivotal : Multiple	-	0.000		2.094	Mar 2019	1.930	Mar 2020	0.000		1.930	Continuing	Continuing	-
		Subtotal	-	0.000		5.294		4.932		0.000		4.932	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
C2AOS-C2IS Lead Development Test and Evaluation Organization	PO	96th Test Wing : Eglin AFB, FL	-	0.000		0.650	Jan 2019	0.650	Jan 2020	0.000		0.650	Continuing	Continuing	-
		Subtotal	-	0.000		0.650		0.650		0.000		0.650	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
C2AOS-C2IS Systems Engineering	SS/ Various	MITRE : Bedford, MA	-	0.000		0.955	Oct 2018	0.714	Oct 2019	0.000		0.714	Continuing	Continuing	-
C2AOS-C2IS Program Management Administration	C/Various	Various : Hanscom AFB, MA	-	0.000		0.697	Oct 2018	0.484	Oct 2019	0.000		0.484	Continuing	Continuing	-
		Subtotal	-	0.000		1.652		1.198		0.000		1.198	Continuing	Continuing	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.000		7.596		6.780		0.000		6.780	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305015F / *C2 Air Operations Suite - C2 Info Services*	**Project (Number/Name)** 675218 / *Applications Development*

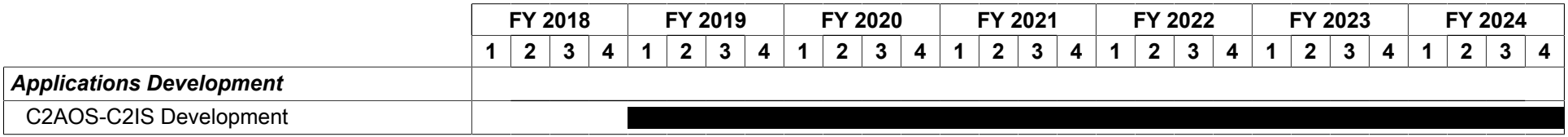

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305015F / *C2 Air Operations Suite - C2 Info Services*	**Project (Number/Name)** 675218 / *Applications Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Applications Development				
C2AOS-C2IS Development	1	2019	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305015F / *C2 Air Operations Suite - C2 Info Services*	Project (Number/Name) 675220 / *Unit Level*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675220: *Unit Level*	-	0.000	1.012	2.533	0.000	2.533	0.000	0.000	0.000	0.000	0.000	3.545
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Command and Control, Incident Management, Emergency Response Application (C2IMERA; formerly Unit Command and Control [UC2]) funds are used to develop and integrate C2IMERA as an evolving sequence of increasing software capabilities that support a wing commander's ability to track base level resources, incident management, and a real time Common Operating Picture, enabling a commander to have total situational awareness during peace and wartime operations. C2IMERA operations software systems addresses needs identified in the TBMCS Operational Requirements Document (ORD) (2001), the UC2 Baseline System Requirements Document (SRD), and AF Form 1067, Modification Proposal, requirements documents. C2IMERA is utilizing Agile DevOps methodology by directly soliciting user feedback for improvements to the software. C2IMERA is fielded to Wing Operations Centers (WOC), the Maintenance Operations Centers (MOC), the Emergency Operations Centers (EOC), Crisis Action Teams (CAT), and many other work-centers across multiple MAJCOMs with plans to expand for use as an AF wide application.

In FY 2020, C2IMERA core development activities will be to add functions that improve user experience and performance, provide additional interfaces, Information Assurance (IA) improvements and solving test deficiencies.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver C2IMERA capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, and 0605898F.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: UC2/C2IMERA Software Development	0.000	0.912	2.433	0.000	2.433
Description: C2IMERA software development and integration. ***FY 2019 Plans:*** - Develop continuous delivery pipeline through cloud enabled application - Continually enhance C2IMERA to meet current requirements and address emerging changes - Field C2IMERA via the cloud ***FY 2020 Base Plans:*** - Transition C2IMERA from cloud friendly to cloud native - Continue to enhance the software to improve the user experience					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305015F / *C2 Air Operations Suite - C2 Info Services*	**Project (Number/Name)** 675220 / *Unit Level*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
- Continue to field C2IMERA via the cloud ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding increased due to prime contract effort ramp up.					
Title: UC2/C2IMERA Testing and Test Support ***Description:*** C2IMERA testing and test support activities. ***FY 2019 Plans:*** - Test the continuous delivery pipeline to verify all changes successfully transition prior to fielding - Test all automated C2IMERA modifications to ensure they do not hinder usability ***FY 2020 Base Plans:*** - Continue to verify the continuous delivery pipeline - Continue to test C2IMERA modifications ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A	0.000	0.100	0.100	0.000	0.100
Accomplishments/Planned Programs Subtotals	0.000	1.012	2.533	0.000	2.533

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPAF 03 834520: *Theater Battle Mgt C2 System*	3.384	0.967	0.500	-	0.500	0.000	0.000	0.000	0.000	0.000	4.851

Remarks

D. Acquisition Strategy

Projects will be awarded via a sole-source contract for Agile DevOps development, fielding and support activities. The acquisition and contracting strategies were approved by the Senior Materiel Leader on 20 June 2018.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305015F / *C2 Air Operations Suite - C2 Info Services*	**Project (Number/Name)** 675220 / *Unit Level*

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305015F / *C2 Air Operations Suite - C2 Info Services*	**Project (Number/Name)** 675220 / *Unit Level*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
UC2/C2IMERA Development	C/CPFF	Leidos Inc. : Reston, VA	-	0.000		0.465	Jan 2019	1.986	Jan 2020	0.000		1.986	0.000	2.451	-
		Subtotal	-	0.000		0.465		1.986		0.000		1.986	0.000	2.451	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
UC2/C2IMERA Testing and Test Support	PO	96th Test Wing : Eglin, FL	-	0.000		0.100	Mar 2019	0.100	Mar 2020	0.000		0.100	0.000	0.200	-
		Subtotal	-	0.000		0.100		0.100		0.000		0.100	0.000	0.200	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
UC2/C2IMERA Systems Engineering	SS/ Various	MITRE : Bedford, MA	-	0.000		0.327	Oct 2018	0.327	Oct 2019	0.000		0.327	0.000	0.654	-
UC2/C2IMERA Program Management Administration	C/Various	Various : Hanscom AFB, MA	-	0.000		0.100	Oct 2018	0.100	Oct 2019	0.000		0.100	0.000	0.200	-
UC2/C2IMERA Cyber Support	MIPR	Various : Hanscom AFB, MA	-	0.000		0.020	Dec 2018	0.020	Dec 2019	0.000		0.020	0.000	0.040	-
		Subtotal	-	0.000		0.447		0.447		0.000		0.447	0.000	0.894	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.000		1.012		2.533		0.000		2.533	0.000	3.545	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305015F / *C2 Air Operations Suite - C2 Info Services*	**Project (Number/Name)** 675220 / *Unit Level*

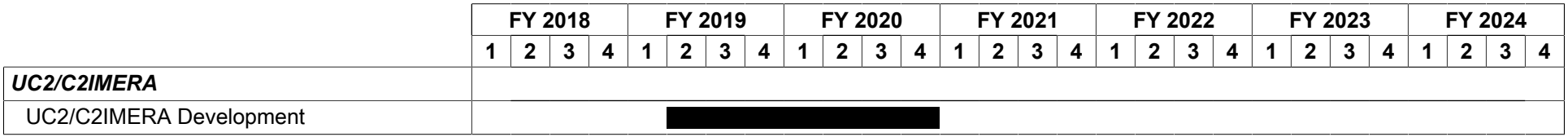

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305015F / *C2 Air Operations Suite - C2 Info Services*	**Project (Number/Name)** 675220 / *Unit Level*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
UC2/C2IMERA				
UC2/C2IMERA Development	2	2019	4	2020

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305020F / *CCMD Intelligence Information Technology*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	1.542	1.586	1.121	0.000	1.121	1.652	1.691	1.722	1.753	Continuing	Continuing
674901: *Ccmd Intelligence Information Technology*	-	0.000	1.586	1.121	0.000	1.121	1.652	1.691	1.722	1.753	Continuing	Continuing
675898: *International Intelligence Technology and Arc*	-	1.542	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

Combatant Commands (CCMDs) require a cohesive, flexible Information Technology enterprise to ensure intelligence content informs analysis, planning, warfighter operations, and strategic decision making. Currently, the Combatant Command (CCMD) Intelligence Enterprise Management Support Office (EMSO) is at the nexus of multiple service providers, networks, systems, applications, classification levels, and funding. The vast majority of these IT services are tailored to Intelligence Community (IC) users vice CCMD-specific missions or needs. This minority stake and the physical and organizational separation of CCMD users limits their ability to influence the development and delivery of services, or results in poorly sustained one-off, vice enduring enterprise-wide, solutions. Beginning in late 2014, the CCMDs requested the Office of the Under Secretary of Defense for Intelligence (OUSD(I)) and the Joint Staff address longstanding gaps in their intelligence IT capabilities to support planning and operations. In response, OUSD(I) and Joint Staff/J2 sponsored an effort to document the required capabilities and chronic shortfalls, and to validate these requirements through the Joint Requirements Oversight Council (JROC). The initial Capabilities Based Assessment (CBA) for the Combatant Command Intelligence Information Technology (CCIIT) Enterprise was completed in February 2016, and an Information Systems Initial Capabilities Document (IS ICD) was approved by the JROC in September 2016. In November 2016, USD(I) requested the Secretary of the Air Force, Administrative Assistant (SAF/AA) establish a Provisional Program Activity Office (PPAO) for CCIIT, to advocate for materiel and non-materiel solutions for these validated requirements. Through FY2017, the CCIIT PPAO has actively engaged with the CCMDs and service providers throughout DoD and the IC to refine requirements, identify potential solutions, produce an integrated baseline enterprise architecture, and align and integrate capabilities across the enterprise critical to the warfighter. As of August 2018, CCIIT PPAO, transitioned to a fully operational, enduring Enterprise Management Support Office (EMSO) assisting OUSD(I); the new moniker is Combatant Command (CCMD) Intelligence- Enterprise Management Support Office (EMSO).

The FY 2020 funding request was reduced by $0.498 million to account for the availability of prior year execution balances.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force					Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*			R-1 Program Element (Number/Name) PE 0305020F / *CCMD Intelligence Information Technology*		
B. Program Change Summary ($ in Millions)	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**
Previous President's Budget	1.542	1.586	1.619	0.000	1.619
Current President's Budget	1.542	1.586	1.121	0.000	1.121
Total Adjustments	0.000	0.000	-0.498	0.000	-0.498
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	-0.498	0.000	-0.498

Change Summary Explanation

FY19 to FY20 funding decreased to account for the availability of prior year execution balances.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305020F / *CCMD Intelligence Information Technology*	Project (Number/Name) 674901 / *Ccmd Intelligence Information Technology*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
674901: *Ccmd Intelligence Information Technology*	-	0.000	1.586	1.121	0.000	1.121	1.652	1.691	1.722	1.753	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Combatant Commands (CCMDs) require a cohesive, flexible Information Technology enterprise to ensure intelligence content informs analysis, planning, warfighter operations, and strategic decision making. Currently, the Combatant Command (CCMD) Intelligence Enterprise Management Support Office (EMSO) is at the nexus of multiple service providers, networks, systems, applications, classification levels, and funding. The vast majority of these IT services are tailored to Intelligence Community (IC) users vice CCMD-specific missions or needs. This minority stake and the physical and organizational separation of CCMD users limits their ability to influence the development and delivery of services, or results in poorly sustained one-off, vice enduring enterprise-wide, solutions. Beginning in late 2014, the CCMDs requested the Office of the Under Secretary of Defense for Intelligence (OUSD(I)) and the Joint Staff address longstanding gaps in their intelligence IT capabilities to support planning and operations. In response, OUSD(I) and Joint Staff/J2 sponsored an effort to document the required capabilities and chronic shortfalls, and to validate these requirements through the Joint Requirements Oversight Council (JROC). The initial Capabilities Based Assessment (CBA) for the Combatant Command Intelligence Information Technology (CCIIT) Enterprise was completed in February 2016, and an Information Systems Initial Capabilities Document (IS ICD) was approved by the JROC in September 2016. In November 2016, USD(I) requested the Secretary of the Air Force, Administrative Assistant (SAF/AA) establish a Provisional Program Activity Office (PPAO) for CCIIT, to advocate for materiel and non-materiel solutions for these validated requirements. Through FY2017, the CCIIT PPAO has actively engaged with the CCMDs and service providers throughout DoD and the IC to refine requirements, identify potential solutions, produce an integrated baseline enterprise architecture, and align and integrate capabilities across the enterprise critical to the warfighter. As of August 2018, CCIIT PPAO, transitioned to a fully operational, enduring Enterprise Management Support Office (EMSO) assisting OUSD(I); the new moniker is Combatant Command (CCMD) Intelligence- Enterprise Management Support Office (EMSO).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Combatant Command Intelligence Information Technology (CCMD Intel IT)	0.000	1.586	1.121	-	1.121
Description: Development, modification, and integration of new functionality to support improved end-to-end service delivery against one or more of six validated requirements areas within the CCIIT Enterprise operational mission set. ***FY 2019 Plans:*** The RDT&E funds are being used to develop a prototype software interface designed to integrate existing Intelligence Process tools (Collection Management, Asset Management, Assessments, etc.) into a single interface providing Command Intelligence and Operational Staffs ability to monitor and					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305020F / *CCMD Intelligence Information Technology*	**Project (Number/Name)** 674901 / *Ccmd Intelligence Information Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
influence the intelligence process across service providers. ***FY 2020 Base Plans:*** Continuation of efforts: The RDT&E funds are being used to develop a prototype software interface designed to integrate existing Intelligence Process tools (Collection Management, Asset Management, Assessments, etc.) into a single interface providing Command Intelligence and Operational Staffs ability to monitor and influence the intelligence process across service providers. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding decreased due to poor contract execution leading to under execution of FY19 funding.					
Accomplishments/Planned Programs Subtotals	0.000	1.586	1.121	-	1.121

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• O&M PE 0305020F: *CCMD Intelligence Information Technology*	12.479	12.736	12.703	-	12.703	12.679	12.669	12.897	13.129	Continuing	Continuing

Remarks

D. Acquisition Strategy

RDT&E funds will be applied as a modification to an existing contract vehicle to address identified requirements, and align and integrate capabilities across the enterprise critical to the warfighter.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305020F / *CCMD Intelligence Information Technology*	**Project (Number/Name)** 674901 / *Ccmd Intelligence Information Technology*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development Package	C/CPAF	Other Contracting : Fairfax, VA	-	-		1.586	Mar 2019	1.121	Mar 2020	-		1.121	Continuing	Continuing	-
		Subtotal	-	-		1.586		1.121		-		1.121	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		1.586		1.121		-		1.121	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305020F / *CCMD Intelligence Information Technology*	**Project (Number/Name)** 674901 / *Ccmd Intelligence Information Technology*

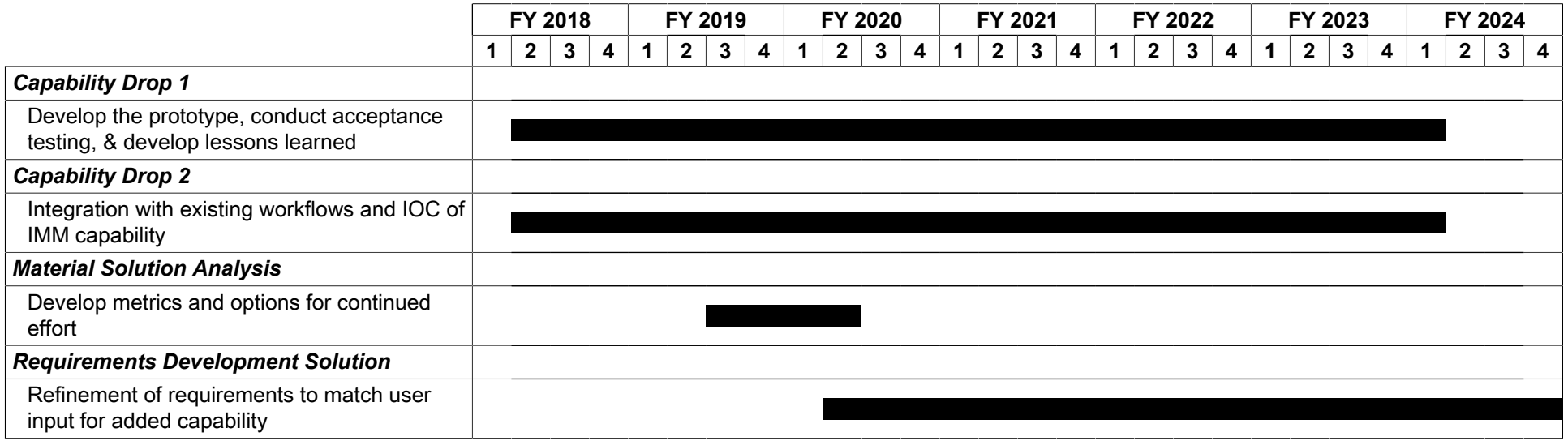

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305020F / *CCMD Intelligence Information Technology*	**Project (Number/Name)** 674901 / *Ccmd Intelligence Information Technology*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Capability Drop 1				
Develop the prototype, conduct acceptance testing, & develop lessons learned	2	2018	1	2024
Capability Drop 2				
Integration with existing workflows and IOC of IMM capability	2	2018	1	2024
Material Solution Analysis				
Develop metrics and options for continued effort	3	2019	2	2020
Requirements Development Solution				
Refinement of requirements to match user input for added capability	2	2020	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305020F / *CCMD Intelligence Information Technology*	Project (Number/Name) 675898 / *International Intelligence Technology and Arc*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675898: *International Intelligence Technology and Arc*	-	1.542	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Combatant Commands (CCMDs) require a cohesive, flexible Information Technology enterprise to ensure intelligence content informs analysis, planning, warfighter operations, and strategic decision making. Currently, the Combatant Command (CCMD) Intelligence Enterprise Management Support Office (EMSO) is at the nexus of multiple service providers, networks, systems, applications, classification levels, and funding. The vast majority of these IT services are tailored to Intelligence Community (IC) users vice CCMD-specific missions or needs. This minority stake and the physical and organizational separation of CCMD users limits their ability to influence the development and delivery of services, or results in poorly sustained one-off, vice enduring enterprise-wide, solutions. Beginning in late 2014, the CCMDs requested the Office of the Under Secretary of Defense for Intelligence (OUSD(I)) and the Joint Staff address longstanding gaps in their intelligence IT capabilities to support planning and operations. In response, OUSD(I) and Joint Staff/J2 sponsored an effort to document the required capabilities and chronic shortfalls, and to validate these requirements through the Joint Requirements Oversight Council (JROC). The initial Capabilities Based Assessment (CBA) for the Combatant Command Intelligence Information Technology (CCIIT) Enterprise was completed in February 2016, and an Information Systems Initial Capabilities Document (IS ICD) was approved by the JROC in September 2016. In November 2016, USD(I) requested the Secretary of the Air Force, Administrative Assistant (SAF/AA) establish a Provisional Program Activity Office (PPAO) for CCIIT, to advocate for materiel and non-materiel solutions for these validated requirements. Through FY2017, the CCIIT PPAO has actively engaged with the CCMDs and service providers throughout DoD and the IC to refine requirements, identify potential solutions, produce an integrated baseline enterprise architecture, and align and integrate capabilities across the enterprise critical to the warfighter. As of August 2018, CCIIT PPAO, transitioned to a fully operational, enduring Enterprise Management Support Office (EMSO) assisting OUSD(I); the new moniker is Combatant Command (CCMD) Intelligence- Enterprise Management Support Office (EMSO).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Combatant Command Intelligence Information Technology (CCMD Intel IT)	1.542	0.000	0.000	0.000	0.000
Description: Development, modification, and integration of new functionality to support improved end-to-end service delivery against one or more of six validated requirements areas within the CCIIT Enterprise operational mission set.					
FY 2019 Plans: N/A.					
FY 2020 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305020F / *CCMD Intelligence Information Technology*	**Project (Number/Name)** 675898 / *International Intelligence Technology and Arc*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
N/A. ***FY 2020 OCO Plans:*** N/A. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A.					
Accomplishments/Planned Programs Subtotals	1.542	0.000	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• O&M PE 0305020F: *CCMD Intelligence Information Technology*	12.479	12.736	12.703	-	12.703	12.679	12.669	12.897	13.129	Continuing	Continuing

Remarks

N/A.

D. Acquisition Strategy

RDT&E funds will be applied as a modification to an existing contract vehicle to address identified requirements, and align and integrate capabilities across the enterprise critical to the warfighter.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305020F / *CCMD Intelligence Information Technology*	Project (Number/Name) 675898 / *International Intelligence Technology and Arc*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	C/CPAF	AFRL : Rome Labs, NY	-	1.542	Mar 2018	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	1.542		-		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	1.542		0.000		-		-		-	Continuing	Continuing	N/A

Remarks

N/A.

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305020F / *CCMD Intelligence Information Technology*	**Project (Number/Name)** 675898 / *International Intelligence Technology and Arc*

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Capability Drop 1																												
Develop the prototype, conduct acceptance testing, & develop lessons learned	[redacted]																											

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305020F / *CCMD Intelligence Information Technology*	**Project (Number/Name)** 675898 / *International Intelligence Technology and Arc*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Capability Drop 1				
Develop the prototype, conduct acceptance testing, & develop lessons learned	1	2018	4	2018

Note

N/A.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305022F / *ISR Modernization & Automation Dvmt (IMAD)*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	19.000	0.000	19.000	19.300	19.200	19.300	19.400	Continuing	Continuing
675197: *Core Technology*	-	0.000	0.000	16.000	0.000	16.000	16.000	16.000	16.000	16.000	Continuing	Continuing
675306: *Analysis Enterprise*	-	0.000	0.000	3.000	0.000	3.000	3.300	3.200	3.300	3.400	Continuing	Continuing

Note

This program, BA 7, PE 0305022F, project 675197, Algorithmic Warfare, is a new start.
This program, BA 7, PE 0305022F, project 675306, Kill Chain Automation, is a new start.

A. Mission Description and Budget Item Justification

(U) AF ISR must adapt large data sets and condition it into mission sets, allowing personnel to discover, manage, and analyze data and transform it into living intelligence. Kill Chain Automation applies new methodologies; advances automation and machine learning; ensures data is accessible, agreeable, and interoperable; and delivers decision advantage.

(U//FOUO) Algorithmic Warfare encompasses efforts to develop, employ, or field artificial intelligence, automation, machine learning, deep learning, and computer vision algorithms. This critical shift to the digital age will transition ISR analysis from the "what" to the "why" of analysis via human-machine teaming. Algorithmic Warfare can provide world-class ISR support to Joint Operations at the scale and speed required in modern warfare against our adversaries.

(U//FOUO) Algorithmic Warfare reshapes current sense, identify, attribute, share (SIAS, previously known as PED - processing, exploitation, and dissemination) models because the current models will be unsustainable and ineffective in developing ISR digital solutions to find efficiencies and thrive in a complex operating environment. This funding is a first step to address ISR analysts' struggles with data overload; they currently spend 80 percent of their time searching for data and 20 percent of their time making sense of the information.

(U) Supports National Defense Strategy priority of operating at the "speed of relevance."

(U) Supports Next Generation ISR Dominance Flight Plan.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305022F / *ISR Modernization & Automation Dvmt (IMAD)*

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	19.000	0.000	19.000
Total Adjustments	0.000	0.000	19.000	0.000	19.000
• 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	19.000	0.000	19.000

Change Summary Explanation

New start in FY20.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305022F / *ISR Modernization & Automation Dvmt (IMAD)*	Project (Number/Name) 675197 / *Core Technology*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675197: *Core Technology*	-	0.000	0.000	16.000	0.000	16.000	16.000	16.000	16.000	16.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 7, PE 0305022F, project 675197, Algorithmic Warfare, is a new start.

A. Mission Description and Budget Item Justification

(U//FOUO) Algorithmic Warfare encompasses efforts to develop, employ, or field artificial intelligence, automation, machine learning, deep learning, and computer vision algorithms. This critical shift to the digital age will transition ISR analysis from the "what" to the "why" of analysis via human-machine teaming. Algorithmic Warfare can provide world-class ISR support to Joint Operations at the scale and speed required in modern warfare against our adversaries.

(U//FOUO) Algorithmic Warfare reshapes current sense, identify, attribute, share (SIAS, previously known as PED - processing, exploitation, and dissemination) models because the current models will be unsustainable and ineffective in developing ISR digital solutions to find efficiencies and thrive in a complex operating environment. This funding is a first step to address ISR analysts' struggles with data overload; they currently spend 80 percent of their time searching for data and 20 percent of their time making sense of the information.

(U) Supports National Defense Strategy priority of operating at the "speed of relevance."

(U) Supports Next Generation ISR Dominance Flight Plan.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Algorithmic Warfare	-	0.000	16.000
Description: SECAF directed the AF to invest in a more automated environment to relieve strain on manpower in the out years. Algorithmic Warfare can provide world-class ISR support to Joint Operations at the scale and speed required in modern warfare against our adversaries. This effort supports National Defense Strategy of operating at the "speed of relevance."			
FY 2019 Plans: N/A			
FY 2020 Plans: Provides RDT&E funding to develop ISR Algorithmic Warfare - artificial intelligence, automation, machine learning, deep learning, and computer vision algorithms.			
FY 2019 to FY 2020 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305022F / *ISR Modernization & Automation Dvmt (IMAD)*	**Project (Number/Name)** 675197 / *Core Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
New start in FY20.			
Accomplishments/Planned Programs Subtotals	-	0.000	16.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305022F / *ISR Modernization & Automation Dvmt (IMAD)*	**Project (Number/Name)** 675197 / *Core Technology*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Algorithmic Warfare	TBD	HAF/A2 : Pentagon, DC	-	0.000		0.000		16.000		-		16.000	Continuing	Continuing	-
		Subtotal	-	0.000		0.000		16.000		-		16.000	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.000		0.000		16.000		-		16.000	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305022F / *ISR Modernization & Automation Dvmt (IMAD)*	**Project (Number/Name)** 675197 / *Core Technology*

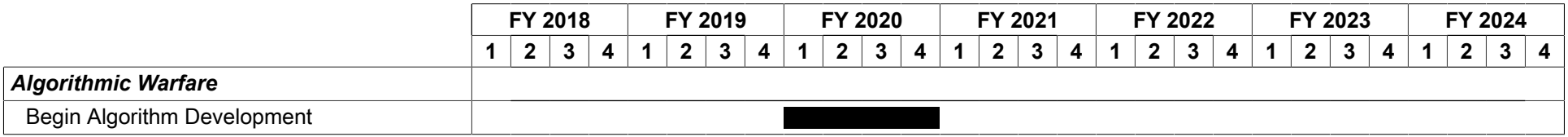

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305022F / *ISR Modernization & Automation Dvmt (IMAD)*	**Project (Number/Name)** 675197 / *Core Technology*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Algorithmic Warfare				
Begin Algorithm Development	1	2020	4	2020

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305022F / *ISR Modernization & Automation Dvmt (IMAD)*	Project (Number/Name) 675306 / *Analysis Enterprise*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675306: *Analysis Enterprise*	-	0.000	0.000	3.000	0.000	3.000	3.300	3.200	3.300	3.400	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 7, PE 0305022F, project 675306, Kill Chain Automation, is a new start.

A. Mission Description and Budget Item Justification

(U) AF ISR must adapt large data sets and condition it into mission sets, allowing personnel to discover, manage, and analyze data and transform it into living intelligence. Kill Chain Automation applies new methodologies; advances automation and machine learning; ensures data is accessible, agreeable, and interoperable; and delivers decision advantage.

(U) Supports National Defense Strategy priority of operating at the "speed of relevance."

(U) Supports Next Generation ISR Dominance Flight Plan.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Kill Chain Automation	-	0.000	3.000
Description: AF's first ISR investment to work large data sets, automation, COTS IT tolls, and data aggregation. ***FY 2019 Plans:*** N/A ***FY 2020 Plans:*** Funds software development to automate ISR analyst workflows; analysts currently spend 80 percent of their time searching for data and 20 percent of their time making sense of information. Human-machine teaming allows humans and machines to focus on activities they each do best. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY20 New Start			
Accomplishments/Planned Programs Subtotals	-	0.000	3.000

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305022F / *ISR Modernization & Automation Dvmt (IMAD)*	**Project (Number/Name)** 675306 / *Analysis Enterprise*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305022F / *ISR Modernization & Automation Dvmt (IMAD)*	**Project (Number/Name)** 675306 / *Analysis Enterprise*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Kill Chain Automation	C/Various	HAF/A2 : Pentagon, DC	-	-		-		3.000	Dec 2019	-		3.000	Continuing	Continuing	-
		Subtotal	-	-		-		3.000		-		3.000	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		0.000		3.000		-		3.000	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305022F / *ISR Modernization & Automation Dvmt (IMAD)*	**Project (Number/Name)** 675306 / *Analysis Enterprise*

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Kill Chain Automation																												
Begin automation development									[redacted]																			

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305022F / *ISR Modernization & Automation Dvmt (IMAD)*	**Project (Number/Name)** 675306 / *Analysis Enterprise*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Kill Chain Automation				
Begin automation development	1	2020	4	2020

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305099F / *Global Air Traffic Management (GATM)*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	4.887	4.106	4.544	0.000	4.544	4.654	4.750	4.837	4.924	Continuing	Continuing
674689: *Global Access Architecture*	-	4.887	4.106	4.544	0.000	4.544	4.654	4.750	4.837	4.924	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program element funds the Air Force Life Cycle Management Center (AFLCMC) Aerospace Management Systems Division (AMSD), the designated Air Force (AF) Communications, Navigation, Surveillance/Air Traffic Management (CNS/ATM) and Navigation Safety Center of Excellence (COE). The COE provides highly specialized analysis, assessment and performance monitoring expertise to Headquarters Air Force, AF major commands (MAJCOM), and weapon system program offices regarding CNS/ATM system technical functions and performance standards for safe and efficient operations in the US National Airspace System (NAS) and international civil airspace. This centralized capability supplements the MAJCOMs and over 30 AF weapon system program offices with resident CNS/ATM technical expertise.

This funding enables the AMSD to monitor and participate in government and industry technical forums and U.S. and International civil aviation standards bodies such as the Federal Aviation Administration (FAA), International Civil Aviation Organization (ICAO), Radio Technical Commission for Aeronautics (RTCA), Airlines Electronic Engineering Committee (AEEC) and others, responsible for the development and assessment of international civil aviation standards for safe and efficient operations in worldwide airspace. Division personnel analyze civil standards as they are being developed and work to influence them to support Department of Defense (DoD) interests. CNS/ATM COE experts identify specific technical and engineering criteria established by DoD and these standards bodies and document them in generic performance matrices (GPMs). The COE works with MAJCOM and program office personnel to develop strategies for implementing CNS/ATM requirements on AF weapon systems and tailor the GPMs to each platform's unique avionics architecture and operational mission. Once CNS/ATM component integration and testing is completed, COE personnel validate platform CNS/ATM performance against the standards necessary to operate in worldwide civil airspace. This assessment is submitted to the aircraft program office and becomes part of their Airworthiness certification package.

The program office provides technical analysis and assessments of CNS/ATM and navigation safety avionics equipment throughout the lifecycle of aircraft platforms. Efforts include and are not limited to performance assessment, test support, performance monitoring, interoperability testing, cybersecurity assessments, and the development and assessment of CNS/ATM capabilities for unmanned platforms such as location-specific Ground Based Detect and Avoid radar and airspace (GBDAA) characterization.

The program office office administers the electronic DoD Avionics Equipment Catalog (iGATM) through an Indefinite Delivery/Indefinite Quantity (IDIQ) contract vehicle that enables centralized procurement of CNS/ATM and navigation safety avionics equipment and manages other contracts offering technical engineering services to aircraft platform program offices. Technical engineering services may include and is not limited to performance monitoring, interoperability testing, cybersecurity

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305099F / *Global Air Traffic Management (GATM)*

assessments, and development and assessment of CNS/ATM capabilities for unmanned platforms such as location-specific GBDAA characterization. These contracts are used by aircraft program offices across the DoD, among other federal agencies, and in support of foreign military sales.

The program office performs periodic and event driven audits required by civil aviation assurance standards on processes used to develop and distribute the Digital Aeronautical Flight Information File (DAFIF) to DoD users. This electronic navigation database, developed and maintained by the National Geospatial Intelligence Agency (NGA), contains critical safety of flight information used by all DoD flight crews to fly instrument flight rules procedures worldwide.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver CNS/ATM weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605833F and 0605898F.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	4.453	4.492	4.575	0.000	4.575
Current President's Budget	4.887	4.106	4.544	0.000	4.544
Total Adjustments	0.434	-0.386	-0.031	0.000	-0.031
• Congressional General Reductions	-0.242	-0.386			
• 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	0.815	0.000			
• SBIR/STTR Transfer	-0.139	0.000			
• Other Adjustments	0.000	0.000	-0.031	0.000	-0.031

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: CNS/ATM COE Administration of DoD Avionics Equipment Catalog	0.783	0.796	0.798

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305099F / *Global Air Traffic Management (GATM)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: Multiple contract vehicles with multiple avionics vendors that enable centralized procurement of CNS/ATM avionics equipment/components. Supports numerous DoD, US Federal Agency, and Foreign Military Sales program offices. Provide preferred customer pricing and extended warranty. ***FY 2019 Plans:*** Continue administration of the catalog and monitor industry for new CNS/ATM Products which could be added to catalog. ***FY 2020 Plans:*** Continue administration of the DoD electronic avionics equipment catalog and monitor industry for new CNS/ATM products and technical services which could be added to catalog. Follow-on catalog ID/IQ contract planned 4QFY20. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Projected rate Increase for DMS and PMA Support.			
Title: CNS/ATM COE Digital Aeronautical Flight Information File (DAFIF) Management ***Description:*** Perform periodic audits of the processes and procedures utilized by organizations involved in the development and distribution of critical safety of flight electronic databases used by aircrews to fly instrument flight rules procedures worldwide. Ensures the validity of multiple sources of information critical to implementation of international performance based navigation (PBN) standards. ***FY 2019 Plans:*** Work with DoD agencies and the FAA to develop performance based procedures required to operate without restriction in the NAS and in international civil aviation environments. Continue to publish procedures and databases with the required degree of accuracy/performance necessary to operate manned and remotely piloted aircraft in NAS. ***FY 2020 Plans:*** Continue efforts with DoD agencies and the FAA to audit/certify electornic navigational databases and sources, and develop performance based procedures required to operate without restriction in the NAS and in international civil aviation environments. Continue to publish procedures and databases with the required degree of accuracy/performance necessary to operate manned and remotely piloted aircraft in NAS. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Projected rate Increase for DMS and PMA Support.	1.880	1.878	1.883
Title: CNS/ATM COE Standards Bodies Engagement and Generic Performance Matrix (GPM) Development	2.224	1.432	1.863

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305099F / *Global Air Traffic Management (GATM)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: Participate in technical forums to understand and influence civil aviation standards to incorporate DoD interests. Create new and/or revise GPMs used by AF platform program offices to ensure aircraft comply with civil aviation requirements. Tailor GPMs for program offices to apply standards to unique aircraft avionics architectures. Assist 30 aircraft program offices with the development of CNS/ATM related test and evaluation plans, the analysis of test/performance data, and the certification of aircraft CNS/ATM performance. ***FY 2019 Plans:*** Continue development of performance matrices to ensure AF manned and remotely piloted aircraft are capable and certified to operate in accordance with emerging ICAO performance based CNS/ATM requirements. ***FY 2020 Plans:*** Continue development of generic and tailored performance matrices to ensure AF manned and remotely piloted aircraft are capable and certified to operate safely and efficiently in worldwide civil airspace in accordance with emerging performance based CNS/ATM requirements. Anticipated support to aircraft platforms in FY20 includes and is not limited to: A-10, B-1, B-52, C-5, C-17, C-130, C-130, E-8, E-3, F-16, F-22, F-35, UH-1N, KC-135, KC-46A, RQ-4, MQ-9, HH-60W and VC-25A/B. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Projected rate Increase for DMS and PMA Support.			
Accomplishments/Planned Programs Subtotals	4.887	4.106	4.544

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

This program primarily supports the acquisition of contractor advisory and assistance service (A&AS) and other technical support personnel to support the efforts described in Section C. This program also provides for the acquisition of contractor services in support of various program management activities within the COE. All of these services are acquired via the issuance of task/delivery orders against existing contractor support contract vehicles available to the CNS/ATM COE.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305099F / *Global Air Traffic Management (GATM)*	Project (Number/Name) 674689 / *Global Access Architecture*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CNS/ATM Center of Excellence: Technical support for CNS/ATM requirement assessments, GPM development, DAFIF navigation data chain audits/certification, and CNS/ATM ID/IQ contract management.	C/T&M	MITRE : Bedford, MA	-	3.236	Oct 2017	2.204	Oct 2018	2.614	Oct 2019	-		2.614	Continuing	Continuing	-
CNS/ATM Center of Excellence: Technical support for operational requirement assessments, GPM development, DAFIF navigation data chain audits/certification, and CNS/ATM ID/IQ contract management.	C/CPFF	Oasis Systems : Lexington, MA	-	0.923	Dec 2017	1.069	Jul 2019	1.090	Jul 2020	-		1.090	Continuing	Continuing	-
		Subtotal	-	4.159		3.273		3.704		-		3.704	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program office support - PMA (Contract Services)	C/T&M	Oasis Systems : Lexington, MA	-	0.517	Aug 2018	0.540	Jul 2019	0.549	Jul 2020	-		0.549	Continuing	Continuing	-
Program office support - PMA (Contract Svcs)	C/T&M	Tecolote/Quantech : Bedford, MA	-	0.013	Oct 2017	0.055	Oct 2018	0.073	Oct 2019	-		0.073	Continuing	Continuing	-
Program office support - PMA (Other Govt Costs)	Various	Various : Bedford, MA	-	0.198	Oct 2017	0.238	Oct 2018	0.218	Oct 2019	-		0.218	Continuing	Continuing	-
		Subtotal	-	0.728		0.833		0.840		-		0.840	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305099F / *Global Air Traffic Management (GATM)*	Project (Number/Name) 674689 / *Global Access Architecture*	

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	4.887		4.106		4.544		-		4.544	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305099F / *Global Air Traffic Management (GATM)*	**Project (Number/Name)** 674689 / *Global Access Architecture*

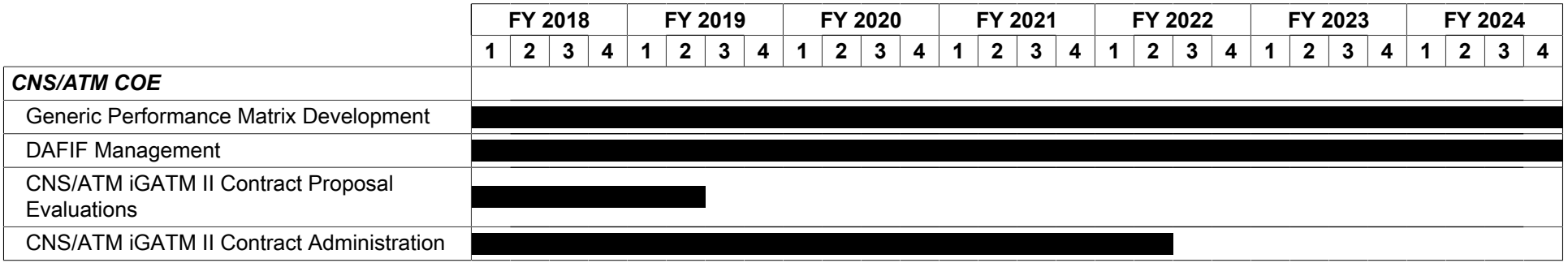

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305099F / *Global Air Traffic Management (GATM)*	**Project (Number/Name)** 674689 / *Global Access Architecture*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
CNS/ATM COE				
Generic Performance Matrix Development	1	2018	4	2024
DAFIF Management	1	2018	4	2024
CNS/ATM iGATM II Contract Proposal Evaluations	1	2018	2	2019
CNS/ATM iGATM II Contract Administration	1	2018	2	2022

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305111F / *Weather Service*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	35.689	34.615	25.461	0.000	25.461	27.105	27.548	28.774	28.762	Continuing	Continuing
672738: *Weather Service*	-	35.689	34.615	25.461	0.000	25.461	27.105	27.548	28.774	28.762	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This budget activity funds operational development necessary to acquire, sustain, and modernize Air Force Weather Service (AFWS) capabilities in support of the 2018 National Defense Strategy (NDS) lines of effort. To improve readiness for a more lethal force, AFWS provides timely, accurate, resilient and relevant environmental information, to include space and terrestrial weather, for global battlespace situational awareness for Air Force (AF), Army, Special Operations Forces (SOF), combatant commands, and other government agencies. AFWS capabilities at home station and deployed provide critical support to the full spectrum of air and space combat operations. AFWS development enhances the lethality, effectiveness, and survivability of AF weapon systems and precision munitions by modernizing capability and seeking the military advantage to accurately predict friendly and foe environmental impacts to optimize mission execution and planning, targeting, weaponeering, battle damage assessment and space systems operations. To strengthen alliances and partnerships, AFWS development efforts integrate DoD, government agency, and commercial and international partner environmental data with AFWS information system equipment for processing, storing, exploiting and disseminating multi-domain weather information for analysis, forecasting, mission integration and greater interoperability. Funding for AFWS development also ensures greater performance and affordability through improvements to architecture and system efficiency, cybersecurity, C4ISR integration, migration to cloud computing, and expanding agile software development, delivery and integration practices.

AFWS aligns activities under four capability areas: Weather Data Collection, Weather Data Analysis and Dissemination, Weather Forecasting, and Product Tailoring/ Warfighter Applications. This alignment ensures an integrated and systems-oriented approach to program management decisions. Of these four capability areas, two (Weather Data Analysis and Dissemination and Weather Forecasting) are addressed by APPN 3600, BA 07, PE 0305111F, Project 672738 - Weather Service.

1. Weather Data Analysis and Dissemination provides command and control and mission planning integration; centralized, cybersecure weather web service capability; large-scale data ingest, processing, and warfighter product generation and visualization; Continuous Delivery/Continuous Integration for software development and deployment; global, regional, and mission execution forecasts; specific, mission-tailored weather data on demand; and weapon system interoperability which shortens the Combatant Commander kill chain through machine to machine interfaces. The Weather Data Analysis and Dissemination capability area includes activities for Weather Data Analysis and its follow-on increment, Weather Data Analysis Increment 5 (WDA and WDA-Inc 5).

2. Weather Forecasting provides advanced scientific numerical weather prediction capabilities for automated, high resolution forecast products for mission planning, rehearsal, and execution with an emphasis on clouds, theater scale weather, aerosol/chemical constituents, and space environment characterization. Weather Forecasting includes activities for Numerical Weather Modeling (NWM); Weather Services - Live, Virtual, Constructive (WS-LVC), and Space Weather Analysis and Forecast System (SWAFS).

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305111F / *Weather Service*

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Weather Services capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, and 0605898F, 0605833F, 1206392F, and 1206398F.

Activities include research and analysis to support current program planning. Management Service costs include Federally Funded Research and Development Centers (FFRDC) and Advisory and Assistance Service (A&AS).

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	26.654	29.942	27.497	0.000	27.497
Current President's Budget	35.689	34.615	25.461	0.000	25.461
Total Adjustments	9.035	4.673	-2.036	0.000	-2.036
• Congressional General Reductions	-0.107	-0.327			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	10.000	5.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.858	0.000			
• Other Adjustments	0.000	0.000	-2.036	0.000	-2.036

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2018	FY 2019
Project: 672738: *Weather Service*		
Congressional Add: *Commercial Weather Data Pilot Program*	10.000	5.000
Congressional Add Subtotals for Project: 672738	10.000	5.000
Congressional Add Totals for all Projects	10.000	5.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305111F / *Weather Service*

Change Summary Explanation

FY18: Congressional add was a program increase to PE 1206422F that was moved to PE 0305111F via technical adjustment for proper funding alignment.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Weather Data Analysis (WDA) ***Description:*** WDA-Increment (Inc) 4 provides a net-centric infrastructure that assimilates worldwide sources of atmospheric and space weather data and produces decision-quality information for warfighters. ***FY 2019 Plans:*** - Implement and develop WDA Inc 4, Build D, Release 18D and Release 19A/B/C/D to enhance the capability to ingest, process, store, access, and disseminate meteorological/oceanographic data via upgrades to the web services architecture. - Continue to expand the Open Geospatial Consortium services and upgrade for the large-scale data processing to accommodate new environmental satellite and numerical weather modeling data as well as begin efforts to implement an Air Force Weather Weapon System Single Services Baseline. - AFW-WEBS builds will be on the same schedule with combined development and testing schedules. - Evolve AFW-WEBS into the single web interface optimized for accessing authoritative AF meteorological information and services in geospatially-enabled formats for direct integration into warfighter systems and decision cycles. ***FY 2020 Base Plans:*** - Finalize Inc 4 activities and transition to Inc 5. - Continue to expand the Open Geospatial Consortium services and upgrade for the large-scale data processing to accommodate new environmental satellite and numerical weather modeling data as well as begin efforts to implement an Air Force Weather Weapon System Single Services Baseline. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding decreased due to funds realigned to WDA Inc 5	10.238	9.567	4.757	0.000	4.757
Title: Weather Data Analysis Increment 5 (WDA Inc 5) ***Description:*** WDA-Inc 5 is the mechanism for the WDA Program to migrate to cloud-based computing through the implementation of Modular Open System Architecture (MOSA) guideline-compliant open architecture. Per MOSA guidelines, WDA Inc 5 will be modular, flexible, responsive, expandable, and cost effective, facilitating	0.000	1.000	5.388	0.000	5.388

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305111F / *Weather Service*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
easy "plug-and-play" of Government off-the-shelf (GOTS) and commercial off-the-shelf (COTS) hardware and software products in a virtual environment. WDA Inc 5 will ensure greater performance and affordability through the continued consolidation of servers and functions, elimination of duplication, and standardizing interfaces. WDA Inc-5 will transition from agile development to Continuous Delivery/Continuous Integration for software development and deployment efforts which will enable rapid updates to functionality and security measures. Finally, the program will provide both classified and unclassified production environments that communicate directly with C2 customers through (MOSA) guideline-compliant open architecture. All of this will be achieved using latest state-of-the-art technology. ***FY 2019 Plans:*** -Begin Inc 5 and continue server consolidation to expedite cloud transition, transition to Open System Architecture, and expand Secret/SCI enclave bandwidth/capability. - Continue to expand the Open Geospatial Consortium services and upgrade for the large-scale data processing to accommodate new environmental satellite and numerical weather modeling data as well as begin efforts to implement an Air Force Weather Weapon System Single Services Baseline. ***FY 2020 Base Plans:*** -Implement and develop WDA Inc 5, Build A, Release 20A/B/C/D to enhance the capability to ingest, process, store, access, and disseminate meteorological/oceanographic data via upgrades to the web services architecture. -Continue to expand the Open Geospatial Consortium services and upgrade for the large-scale data processing to accommodate new environmental satellite and numerical weather modeling data as well as begin efforts to implement an Air Force Weather Weapon System Single Services Baseline. - AFW-WEBS builds will be on the same schedule with combined development and testing schedules. - Evolve AFW-WEBS into the single web interface optimized for accessing authoritative AF meteorological information and services in geospatially-enabled formats for direct integration into warfighter systems and decision cycles. -Migrate to Continuous Delivery/Continuous Integration for software delivery and deployment. -Incorporate Impact Services for increased risk management and agile decision support. -Continue cloud computing transition with all new capabilities housed directly on a cloud platform. ***FY 2020 OCO Plans:***					

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305111F / *Weather Service*	

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding increased due to WDA funding transitioning to WDA Inc 5					
Title: Numerical Weather Modeling (NWM) ***Description:*** NWM provides advanced scientific numerical weather prediction capabilities for automated, high resolution forecast products for mission planning, rehearsal, and execution. Will develop a Global Synthetic Weather Radar (GSWR) capability using artificial intelligence and machine learning techniques in order to mitigate gaps in NDS highlighted AORs. ***FY 2019 Plans:*** -Develop software to exploit dynamic aerosols. -Continue software development for exploitation of new meteorological satellite data sources. -Continue development of explicit numerical weather prediction (modeled) cloud forecasting capability. -Complete 3-year Land Information System (LIS) improvement and integration effort. -Will develop a Global Synthetic Weather Radar (GSWR) capability in order to mitigate gaps in the Central Command and other AORs. ***FY 2020 Base Plans:*** -Complete software development to exploit dynamic aerosols and transition to operations. -Continue software development for exploitation of new satellite data sources while continuing develop explicit NWP-based cloud forecasting capability. -Initiate new 3-year LIS improvement and integration project. -Finish Global Synthetic Weather Radar (GSWR) simulated radar mosaic capability development, begin transition to operations -Software development and deployment will be accomplished with Continuous Delivery/Continuous Integration methods ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding decreased due to no OCO funding for GSWR in FY20.	11.445	14.873	12.355	0.000	12.355
Title: Space Weather Analysis and Forecast System (SWAFS)	0.000	3.582	2.357	0.000	2.357

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305111F / *Weather Service*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total

Description: SWAFS is a software suite of 47 models/applications to Ingest, process, and store space environmental data, run space environmental models to specify and forecast the near-Earth environment, and run space effects characterization applications. SWAFS products support various operations including 1. Spacecraft tracking and health 2. Early Warning & Theater Warning Radar support 3. GPS & SATCOM user support 4. Intel Community support and 5. High Altitude & Space Flight support. The next development efforts include modernizing the SWAFS code and research and implementation of the Radiation Exposure model (RADEX) and the Energetic Charged Particle Hazard Assessment model (ECP HAS) that address space environment irregularities impacting satellite comm & anomaly assessments, precision navigation and timing, and early warning radar interference. This effort was previously called SWAFS-RadEX.

FY 2019 Plans:
- Expand upon the latest atmospheric radiation modeling, and extend capabilities (to include a future forecasting/ mission planning aspect) to support DoD warning thresholds and associated timeliness criteria in support of ECP HAS capability.
- Calculate a map of background cosmic radiation dosages between latitudes S80-N80 and altitudes 50-70 kft, expanding on the current High Flyer Model used by the U2s and in support of hypersonics.
- Investigate solutions for modernization and streamlining of SWAFS software code and migration to the cloud infrastructure.
-Initiate AFRL AoA work to assess existing ECP HAS and RADEX models.

FY 2020 Base Plans:
- Continue prototyping SWAFS code to modernize and migrate to a cloud infrastructure.
- Continue to perform and exploit new data ingest of space weather observations.
- Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, prototyping, etc.

FY 2020 OCO Plans:
N/A

FY 2019 to FY 2020 Increase/Decrease Statement:

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force		Date: February 2019
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C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
FY20 funding decreased through A3W prioritization activities and transfer to PE604002F for BA4 activities. AFRL AoA ECP HAS and RADEX model selection and follow-on technology maturation effort moves to PE0604002F in FY20.					
Title: Weather Services-Live, Virtual Constructive (WS-LVC) ***Description:*** WS-LVC provides DoD Modeling and Simulation users a correlated and realistic natural environment. Tailorable scenarios are used to create specific effects for the warfighter. This effort was formerly called Environmental Data Cube System Support (EDCSS). ***FY 2019 Plans:*** -Continue to provide software enhancements to current meteorological capabilities in order to provide consistent weather behaviors/ environmental impacts across large scale exercises. -Optimize performance in the cloud computing environment, and focus on system stabilization to reduce its sustainment footprint. ***FY 2020 Base Plans:*** -Provide software enhancements through Continuous Delivery/Continuous Integration methods to current meteorological capabilities in order to provide consistent weather behaviors/ environmental impacts across large scale exercises. -Continue to optimize performance in the cloud computing environment, and focus on system stabilization to reduce its sustainment footprint. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A	0.744	0.593	0.604	0.000	0.604
Title: SWAFS GAIM-FP ***Description:*** Modification of Global Assimilation of Ionospheric Measurements GAIM Full Physics model (SWAFS GAIM-FP), to satisfy current requirements, including the development of other new models and science algorithms that do not currently exist and processing space weather data that is not currently available. Capabilities provided: Return to service; corrective, adaptive, and capability improvement maintenance for the operational software baseline SWAFS accepts space weather data and uses models and/or algorithms to create and disseminate specified space weather analysis and forecast products. Users: COCOMs, MAJCOMs, Space	3.262	0.000	0.000	0.000	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305111F / *Weather Service*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Defense Operations Center (SPADOC), NRO, Navy and Army. SWAFS GAIM-FP will reach full operational capability in FY2019. ***FY 2019 Plans:*** N/A ***FY 2020 Base Plans:*** N/A ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A					
Accomplishments/Planned Programs Subtotals	25.689	29.615	25.461	0.000	25.461

	FY 2018	FY 2019
Congressional Add: Commercial Weather Data Pilot Program	10.000	5.000
FY 2018 Accomplishments: -Contract awarded to begin acquisition of commercially available low altitude atmospheric weather data and ionospheric space weather data to evaluate if the data will improve existing numerical weather models to fill sensing gaps.		
FY 2019 Plans: -Purchase commercial satellite and other space-based sensor data to fill sensing gaps. -Accelerate space-based sensor prototypes into orbit. -Integrate data into numerical weather models and perform model performance verification.		
Congressional Adds Subtotals	10.000	5.000

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPAF 03 Line Item 833070: *Weather Observation Forecast*	40.116	48.362	31.855	-	31.855	35.613	33.010	33.605	-	Continuing	Continuing
• OPAF 03 Line Item 838010: *Comm Elect Mods*	10.155	0.000	0.000	-	0.000	0.000	0.000	0.000	-	Continuing	Continuing

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305111F / *Weather Service*

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPAF 05 Line Item 86190A: *Spares and Repair Parts*	0.941	0.000	0.000	-	0.000	0.000	0.000	0.000	-	Continuing	Continuing

Remarks

E. Acquisition Strategy

AF Weather utilizes an AgileDevOps approach delivering capabilities rapidly and routinely using multiple contracts to support a family of ACAT III Programs of Record through development fielding and sustainment.

Cost Plus contracts are utilized for software development and sustainment and Fixed Firm Price contracts for COTS systems and Contract Logistics Support (CLS) efforts. Pre-competed GSA and Defense MicroElectronics Activity (DMEA) contract vehicles are leveraged when appropriate, and competitive and small-business awards are favored.

The Air Force Program Executive Officer for Digital (AFPEO Digital) and the Air Force Program Executive Officer for Space (AFPEO SP) are the PEOs for the AFWS. AFPEO Digital manages the ground-based atmospheric sensing and data analysis, atmospheric forecast systems, and product tailoring warfighter applications. AFPEO SP manages the ground-based segments of space weather collection platforms as well as the Space Weather Analysis and Forecasting System. Both the AFPEO Digital and AFPEO SP are their respective program's Milestone Decision Authority (MDA).

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305111F / *Weather Service*	Project (Number/Name) 672738 / *Weather Service*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
WDA 1, Develop centralized web service capability (WDA 4D)	C/CPIF	Northrop Grumman : Bellevue, NE	-	5.771	Dec 2017	3.312	Jul 2019	1.959	Nov 2019	-		1.959	Continuing	Continuing	-
WDA 1, Develop centralized web service capability (WDA-Inc 5)	C/CPAF	TBD : TBD	-	-		1.000	Sep 2019	4.612	Nov 2019	-		4.612	Continuing	Continuing	-
WDA 2, Development and integration of weather analysis software (AFW-WEBS)	C/CPFF	Raytheon : Long Beach, CA	-	2.868	Dec 2017	4.093	Jul 2019	1.923	Mar 2020	-		1.923	Continuing	Continuing	-
Commercial Weather Pilot Program	C/FFP	Various : Various	-	9.993	Aug 2018	4.835		-		-		-	Continuing	Continuing	-
NWM 1 - Perform software enhancements to the mesoscale production model	MIPR	NCAR : Boulder, CO	-	0.628	Feb 2018	0.649	Feb 2019	0.668	Feb 2020	-		0.668	Continuing	Continuing	-
NWM 2 - Improve land information system (LIS) application, providing earth surface boundary characterization for numerical modeling	MIPR	NASA : Greenbelt, MD	-	1.715	Feb 2018	1.766	Feb 2019	1.819	Feb 2020	-		1.819	Continuing	Continuing	-
NWM 3 - Develop model data assimilation application ensemble forecast procedures and convective scale resolution model capability.	C/CPIF	Northrop Grumman : Bellevue, NE	-	8.086	Jan 2018	8.874	Jun 2019	9.153	Jan 2020	-		9.153	Continuing	Continuing	-
NWM 4 - Deliver a Synthetic Weather Radar Capability mitigating gaps in the Central Command and other AORs.	MIPR	MIT Lincoln Labs : TBD, MA	-	-		3.000	Jan 2020	-		-		-	Continuing	Continuing	-
WS-LVC	C/CPIF	Northrop Grumman : Bellevue, NE	-	0.656	Apr 2018	0.502	Apr 2019	0.366	Apr 2020	-		0.366	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305111F / *Weather Service*	Project (Number/Name) 672738 / *Weather Service*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SWAFS-2- perform verification and validation report on the GAIM-full physics model	C/CPAF	Northrop Grumman : Bellevue, NE	-	-		-		-		-		-	Continuing	Continuing	-
SWAFS development integration and sustainment of the GAIM-full physics version	C/CPIF	Northrop Grumman : Bellevue, NE	-	1.318	Apr 2018	-		-		-		-	Continuing	Continuing	-
SWAFS Magnetic Field Measuring AoA	PO	AFRL : Annapolis, MD	-	-		0.482	Oct 2018	-		-		-	Continuing	Continuing	-
SWAFS Magnetospheric Energized Charged Particle (ECP) Hazard Assessment System (HAS) Model Integration	PO	AFRL : Annapolis, MD	-	-		-		1.480	Oct 2019	-		1.480	Continuing	Continuing	-
SWAFS RadEx Analysis of Alternatives	PO	AFRL : Annapolis, MD	-	0.750	Sep 2018	0.486	May 2019	-		-		-	Continuing	Continuing	-
SWAFS Magnetospheric ECP HAS Analysis of Alternatives	PO	AFRL : Annapolis, MD	-	0.694	Sep 2018	0.486	May 2019	-		-		-	Continuing	Continuing	-
SWAFS Code Modernization and Cloud Migration	C/CPIF	TBD : TBD	-	-		1.573	May 2019	0.374	May 2020	-		0.374	Continuing	Continuing	-
		Subtotal	-	32.479		31.058		22.354		-		22.354	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
46th TS/JITC AFLCMC	WR	46 TS : Offutt AFB, NE	-	0.449	Nov 2017	0.514	Nov 2018	0.529	Nov 2019	-		0.529	Continuing	Continuing	-
		Subtotal	-	0.449		0.514		0.529		-		0.529	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305111F / *Weather Service*	Project (Number/Name) 672738 / *Weather Service*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Administration AFLCMC	C/CPFF	AFLCMC : Hanscom AFB, MA	-	2.261	Oct 2017	2.488	Oct 2018	2.075	Oct 2019	-		2.075	Continuing	Continuing	-
FFRDC SMC	RO	Aerospace Corp : El Segundo, CA	-	0.500	Oct 2017	0.555	Oct 2018	0.503	Oct 2019	-		0.503	Continuing	Continuing	-
		Subtotal	-	2.761		3.043		2.578		-		2.578	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	35.689		34.615		25.461		-		25.461	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305111F / *Weather Service*	**Project (Number/Name)** 672738 / *Weather Service*

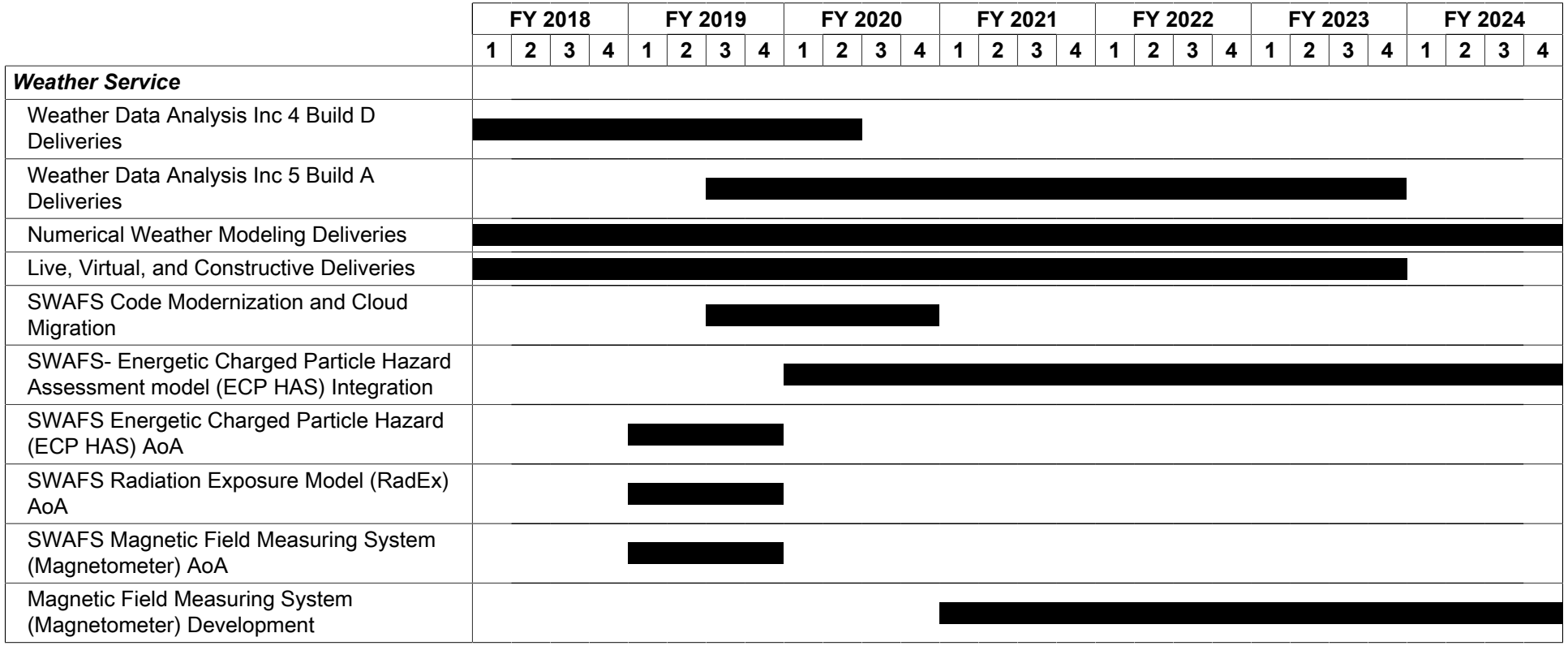

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305111F / *Weather Service*	**Project (Number/Name)** 672738 / *Weather Service*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Weather Service				
Weather Data Analysis Inc 4 Build D Deliveries	1	2018	2	2020
Weather Data Analysis Inc 5 Build A Deliveries	3	2019	4	2023
Numerical Weather Modeling Deliveries	1	2018	4	2024
Live, Virtual, and Constructive Deliveries	1	2018	4	2023
SWAFS Code Modernization and Cloud Migration	3	2019	4	2020
SWAFS- Energetic Charged Particle Hazard Assessment model (ECP HAS) Integration	1	2020	4	2024
SWAFS Energetic Charged Particle Hazard (ECP HAS) AoA	1	2019	4	2019
SWAFS Radiation Exposure Model (RadEx) AoA	1	2019	4	2019
SWAFS Magnetic Field Measuring System (Magnetometer) AoA	1	2019	4	2019
Magnetic Field Measuring System (Magnetometer) Development	1	2021	4	2024

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305114F / *Air Traffic Control, Approach, and Landing System (ATCALS)*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	5.791	13.271	5.651	0.000	5.651	6.565	6.701	6.822	6.944	Continuing	Continuing
673587: *Air Traffic Control Systems*	-	5.791	13.271	5.651	0.000	5.651	6.565	6.701	6.822	6.944	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

To support the Air Force worldwide flying mission, this program element funds research, development, and management of new air traffic control communications, surveillance, automation, positioning, and precision approach and landing systems. When applicable, this includes joint efforts with the Federal Aviation Administration (FAA) and coordination with the International Civil Aviation Organization and the North Atlantic Treaty Organization. ATCALS development funding currently focuses on Future Air Traffic Control (ATC) Technologies within the Next Generation (NextGen) Air Transportation System (ATS) and Deployable Radar Approach Control (DRAPCON) programs as described below.

NextGen ATS. This is the United States initiative for the transformation of the National Airspace System (NAS) over the next 20-30 years to enhance safety, security, efficiency, affordability and capacity, meeting the requirements of all users of the NAS. This interagency effort is designed to identify the warfighter's emerging airspace needs, analyze technologies, formulate requirements and positions, and advise DoD aviation and air traffic communities in order to enable safe and efficient military flight operations in a changing global airspace. Future ATC Technology will be built on key elements from the NextGen ATS projects, leveraging those systems and studies to further advance ATC systems under development. As these technologies and architectures mature, ground system upgrades will be coordinated and fielded concurrently with aircraft avionics capabilities that are acquired and integrated into Air Force aircraft (manned and unmanned). These efforts will involve aircraft avionics as well as fixed based and deployable air traffic control and landing systems. FY20 efforts will continue to research and develop new technologies in the areas of aircraft launch and recovery, airspace interoperability, and optimization of flight capability, as well as continue enabling Unmanned Aircraft System (UAS) access to the NAS, develop a NextGen ATS DoD Strategic Roadmap, add new capabilities to Notice to Airmen (NOTAMs) software, and outline DoD and Air Force equities and requirements via in-depth analysis of FAA NextGen ATS programs and timelines. Portfolio analysis will be captured in DoD NextGen ATS charters to guide Services through a broad and complex NextGen ATS environment. To minimize integration costs, the AF will work across the DoD to adopt a common framework with practical guidelines to evaluate the validity of NextGen ATS initiatives with the Air Force's mission. These efforts support the development of operational strategies that realize the achievement of valid NextGen ATS initiatives in concert with acquisition strategies in integrated avionics advances for focus areas such as Aircraft Launch and Recovery for both fixed and expeditionary operations, Airspace Interoperability, Optimized Flight Capability, and any DoD/USAF or civil US and International Mandates. FY20 tasks will also continue NextGen ATS strategic planning efforts, the conduct of service operational test and evaluation as required, and evaluation of new civil air traffic control and landing system technologies that may have military utility to include an Early Operational Assessment (EOA) of Remote Virtual ATC Tower System technology. In total, these efforts will focus on enabling DoD aircraft to take advantage of NextGen ATS envisioned efficiencies, developing policies/procedures to reduce costs while ensuring airspace access, seamlessly integrating UASs into the NAS and international airspaces, improving the display of aircraft position to air traffic controllers, determining future requirements for digital communications with manned and unmanned aircraft, and enhancing flight safety.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305114F / *Air Traffic Control, Approach, and Landing System (ATCALS)*

Deployable Radar Approach Control (D-RAPCON). D-RAPCON will replace the 50 year old Air National Guard (ANG) AN/MPN-14K and Active Duty (AD) AN/TPN-19 Airport Surveillance Radar and Operations Shelter subsystems with state-of-the-art digital systems. Due to diminishing manufacturing sources, modification and overhaul of the existing systems has proven to be ineffective. On average, due to systemic equipment failures, no more than four of the existing 14 systems are deployable at any given time and none are fully mission capable. Three of these systems are currently deployed. Two of which are at a single location (one for spare parts). D-RAPCON will provide aircraft surveillance/sequencing, air traffic control communications, automation capabilities for terminal area air traffic control operations, and Mode 5 Identification Friend or Foe and secure communication capabilities (a deferred key system attribute). D-RAPCON will also be deployed with a fixed base or deployable Instrument Landing System, a fixed or mobile control tower, and a fixed or mobile Tactical Air Navigation system to provide a complete air traffic control capability. D-RAPCON will support the full range of tactical military, worldwide humanitarian, and domestic disaster relief operations. The primary surveillance radar coverage (non-cooperative targets) extends out 60 nautical miles (nm) and the secondary surveillance radar coverage (cooperative targets) will increase from 120 nm to 200 nm. The D-RAPCON Capability Development Document was approved by the Air Force Requirements Oversight Council on 8 Feb 11. Related OPAF funds are in PE 0305114F Weapon System Code 833010.

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

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	6.306	6.271	6.452	0.000	6.452
Current President's Budget	5.791	13.271	5.651	0.000	5.651
Total Adjustments	-0.515	7.000	-0.801	0.000	-0.801
• Congressional General Reductions	-0.328	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	7.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.187	0.000			
• Other Adjustments	0.000	0.000	-0.801	0.000	-0.801

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305114F / *Air Traffic Control, Approach, and Landing System (ATCALS)*

Change Summary Explanation

The FY2020 funding request was reduced by $0.801 million to account for the availability of prior year execution balances.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: NextGen ATS	5.791	13.271	5.651	0.000	5.651
Description: Includes efforts to implement NextGen ATS efficiencies and capabilities. Focus is on aircraft launch and recovery, airspace interoperability, optimization of flight capability, adherence to mandates, technical support/architecture development, surveillance radar/Automatic Dependent Surveillance Broadcast (ADS-B) integration/automation system upgrades, D-RAPCON Mode 5/Secure Communications integration analysis, Notice to Airmen software upgrades, Air Traffic Control (ATC) training and technology study, expeditionary ATC technology development, conduct of an Early Operational Assessment of Remote Virtual Air Traffic Control Tower technology, development of standards for certification of Infill radars for civil implementation, and development of procedures and tools to support ATC Management of Unmanned Aircraft Systems (UASs) in close proximity with manned aircraft.					
FY 2019 Plans: - Continue to execute analysis of NextGen ATS programs and capture results through charters and incorporate into NextGen ATS DoD Strategic Roadmap which will include the following tasks: -- Continue to analyze FAA radar divestiture impacts and AF radar and FAA ADS-B coverage data for establishing a minimum operating network (MON). -- Continue to develop policy and strategy for UAS implementation in global civil and military airspace. -- Continue to support implementation of ADS-B Out through ATC accommodation procedures for DoD aircraft not equipped with ADS-B Out. -- Begin analysis on avionics security based on known threats. -- Begin development and maturation of technology to support Aircraft Launch and Recovery for both expeditionary and fixed operations. -- Begin supporting advancement in airspace interoperability between civilian and military fleets in both national and international airspace. -- Begin analyzing current and emerging aviation technology to help optimize the efficiency, effectiveness, and safety of flight capabilities. -- Continue to monitor emerging DoD/USAF and civil US and International mandates to ensure compliance of USAF fleets. -- Continue D-RAPCON lead Service operational test and evaluation.					

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305114F / *Air Traffic Control, Approach, and Landing System (ATCALS)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
-- Begin development of Notice to Airmen (NOTAMs) software upgrades to enhance NOTAM creation and query applications and add interface for foreign procedure review requests. -- Complete integration analysis of Mode 5 IFF/Secure Comm into D-RAPCON. -- Begin ATC Training and Technology Study. -- Continue Early Operational Assessment of a Remote Virtual Air Traffic Control Tower capability to assess ability to meet AF flying/ATC missions in lieu of brick and mortar control towers. -- Begin development of Infill radar certification requirements and threshold parameters to enable operational use in the National Airspace System. -- Support on-going FAA and Air Force Research Laboratory development of air traffic control management technology and tools/procedures to ensure unmanned and manned aircraft can safely operate in close proximity.					
FY 2020 Base Plans: -- Will continue to execute analysis of NextGen ATS programs and capture results through charters and incorporate into NextGen ATS DoD Strategic Roadmap which will include the following tasks: -- Will continue to advance Instrument Approach Operations. -- Will continue to investigate areas of optimized Flight Operations. -- Will continue to support implementation of ADS-B Out through ATC accommodation procedures for DoD aircraft not equipped with ADS-B Out. -- Will continue analysis on avionics security based on known threats. -- Will continue to coordinate with interagency partners to promote UAS integration into civil airspace. -- Will continue development and maturation of technology to support Aircraft Launch and Recovery for both expeditionary and fixed operations. -- Will continue supporting advancement in airspace interoperability between civilian and military fleets in both national and international airspace. -- Will continue analyzing current and emerging aviation technology to help optimize the efficiency, effectiveness, and safety of flight capabilities. -- Will continue to monitor emerging DoD/USAF and civil US and International mandates to ensure compliance of USAF fleets. -- Will continue development of Notice to Airmen (NOTAMs) software upgrades to enhance NOTAM creation and query applications. -- Will continue ATC Training and Technology Study. -- Will complete Early Operational Assessment of a Remote Virtual Air Traffic Control Tower capability to assess ability to meet AF flying/ATC missions in lieu of brick and mortar control towers.					

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305114F / *Air Traffic Control, Approach, and Landing System (ATCALS)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
-- Will complete development of Infill radar requirements and threshold parameters to enable operational certification for use in the National Airspace System. -- Will complete effort with FAA and Air Force Research Laboratory to develop air traffic control management technology and procedures/tools to ensure unmanned and manned aircraft can safely operate in close proximity ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A					
Title: D-RAPCON ***Description:*** Effort supports D-RAPCON engineering, manufacturing, and development and government developmental and operational testing of one Pre-Production Unit (PPU) leading to Milestone C and exercise of PPU refurbishment/upgrade option in FY19. Additional RDT&E funds are required to complete D-RAPCON developmental and operational testing. Funds will be realigned from within the Program Executive Office portfolio to complete these tasks. ***FY 2019 Plans:*** - Complete Federal Aviation Administration certifications - Complete government developmental testing and user operational assessment in support of Milestone C decision in Jun 19. - Exercise production option for refurbishment of the pre-production unit in Jul 19 ***FY 2020 Base Plans:*** - Will continue operational testing. Completion of operational testing and full rate production decision/contract award planned in 1st quarter FY21 ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A	0.000	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	5.791	13.271	5.651	0.000	5.651

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305114F / *Air Traffic Control, Approach, and Landing System (ATCALS)*

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPAF 03 Line Item 833010: *Air Traffic Control and Landing Systems*	5.277	51.012	5.363	-	5.363	36.831	56.568	37.077	19.421	Continuing	Continuing
• OPAF 05 Line Item 861900: *Spares and Repair Parts*	0.000	0.932	0.950	-	0.950	3.120	4.798	1.613	1.642	Continuing	Continuing

Remarks

E. Acquisition Strategy

ATCALS is a basket program element with multiple programs in various stages of acquisition which provide the air traffic control infrastructure to support peacetime and wartime missions. The current acquisition strategy is focused on replacing 1960/70s era deployable and fixed based equipment with mature off-the-shelf technology with remote maintenance capability while also looking to the future under the NextGen ATS initiative.

Current contracting efforts include D-RAPCON development, NextGen ATS planning and implementation, and conduct of an Early Operational Assessment (EOA) of Remote Virtual ATC Control Tower technology. The contracting strategy for D-RAPCON development is based on award of a competitive fixed price incentive firm contract emphasizing off-the-shelf technology and maximizing the use of non-developmental items. The contract includes engineering, manufacturing, and development and test with follow-on production options. NextGen ATS Enterprise Architecture Implementation Tasks, Infill radar certification, and ATC Management of UASs are being executed via Military Inter-Departmental Purchase Requests, and Project Orders with various organizations (FAA, MITRE, Army, Air Force Research Laboratory, and Air Force Flight Standards Agency). The Remote Virtual ATC Control Tower EOA contract award was a full and open competition using Other Transaction Authority procedures.

The Air Force Program Executive Officer (PEO) Digital is the PEO for ATCALS and is also the delegated milestone decision authority. Program management, contracts, logistics, and financial management support is provided by the Air Force Life Cycle Management Center Aerospace Management Systems Division (AFLCMC/HBA) which is aligned under PEO/Digital.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305114F / *Air Traffic Control, Approach, and Landing System (ATCALS)*	Project (Number/Name) 673587 / *Air Traffic Control Systems*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NOTAM Software	C/FFP	AFDW/PK : JB Andrews, MD	-	-		0.418	Aug 2019	0.421	Mar 2020	-		0.421	Continuing	Continuing	-
		Subtotal	-	-		0.418		0.421		-		0.421	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NextGen ATS Enterprise Architecture Implementation Support	MIPR	FAA : Washington, DC	-	2.688	Mar 2018	3.341	Mar 2019	3.280	Mar 2020	-		3.280	Continuing	Continuing	-
NextGen ATS Strategic Planning	WR	MITRE : Hanscom AFB, MA	-	0.298	Jan 2018	0.350	Jan 2019	0.250	Jan 2020	-		0.250	Continuing	Continuing	-
NextGen ATS Support Cost	WR	Various : Various	-	0.087	Feb 2018	0.121	Feb 2019	0.450	Feb 2020	-		0.450	Continuing	Continuing	-
NextGen ATS GBDAA Support	MIPR	Various : Various	-	0.400	May 2018	-		-		-		-	0.000	0.400	-
		Subtotal	-	3.473		3.812		3.980		-		3.980	Continuing	Continuing	N/A

Remarks

Various contract types, performing activity and city/states are result of the use of Military Interdepartmental Purchase Requests (MIPR), Work Request (WR), Purchase Requests (PR), Project Orders (PO), etc. that are sent to multiple agencies in support of some tasks.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NextGen ATS Surveillance Radar/Automation System Upgrades (Mode 5)	WR	Various : Various	-	1.401	Nov 2018	1.441	Mar 2019	-		-		-	0.000	2.842	-
Remote Air Traffic Control Tower Capability EOA	WR	Various : Various	-	0.767	Nov 2018	0.350	Feb 2019	0.900	Feb 2020	-		0.900	0.000	2.017	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305114F / *Air Traffic Control, Approach, and Landing System (ATCALS)*	**Project (Number/Name)** 673587 / *Air Traffic Control Systems*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ATCALS Operational Test & Evaluation (OT&E)	WR	Various : Various	-	0.150	Nov 2017	0.250	Jun 2019	0.350	Nov 2019	-		0.350	Continuing	Continuing	-
Infill Radar Certification	MIPR	FAA/AFRL : Washington/Griffiss, DC	-	-		2.000	Apr 2019	-		-		-	0.000	2.000	-
Air Traffic Control of UASs	MIPR	AFRL : Griffiss, NY	-	-		5.000	Apr 2019	-		-		-	0.000	5.000	-
		Subtotal	-	2.318		9.041		1.250		-		1.250	Continuing	Continuing	N/A

Remarks

Various contract types, performing activity and city/states are result of the use of Military Interdepartmental Purchase Requests (MIPR), Work Request (WR), Purchase Requests (PR), Project Orders (PO), etc. that are sent to multiple agencies in support of some tasks.

Additional funds are required to complete D-RAPCON developmental and operational testing in FY19. Funds will be realigned from within the Program Executive Office portfolio to complete these tasks.

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	5.791		13.271		5.651		-		5.651	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305114F / *Air Traffic Control, Approach, and Landing System (ATCALS)*	**Project (Number/Name)** 673587 / *Air Traffic Control Systems*

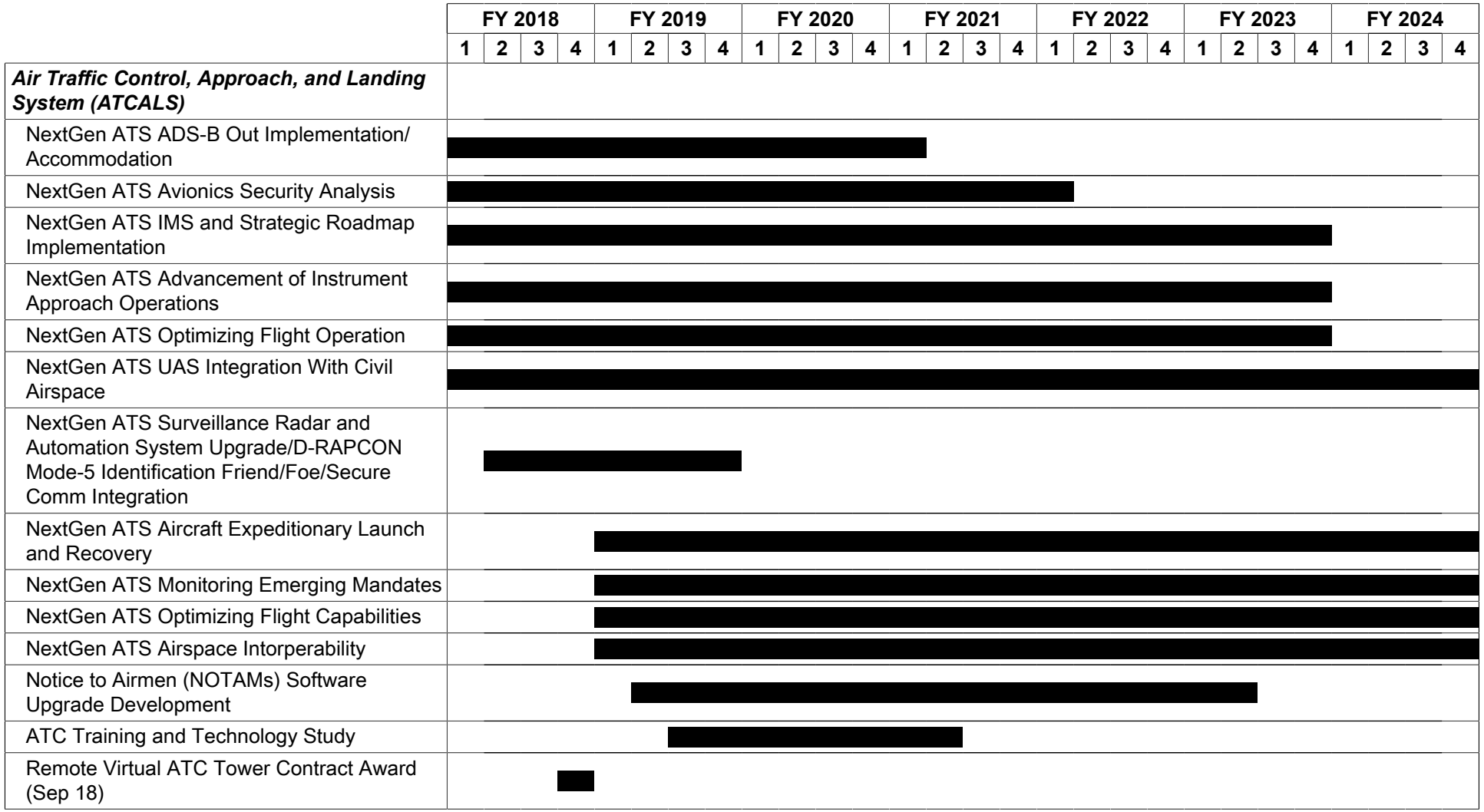

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305114F / *Air Traffic Control, Approach, and Landing System (ATCALS)*	**Project (Number/Name)** 673587 / *Air Traffic Control Systems*

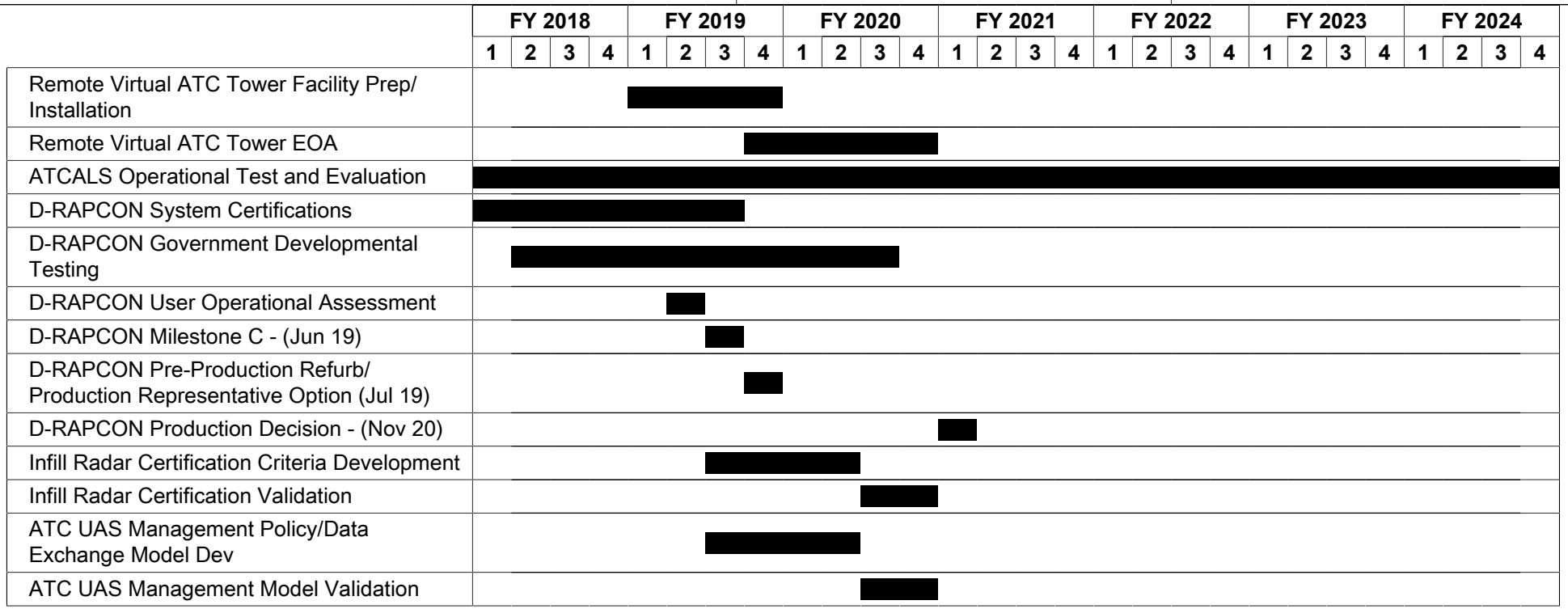

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305114F / *Air Traffic Control, Approach, and Landing System (ATCALS)*	**Project (Number/Name)** 673587 / *Air Traffic Control Systems*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Air Traffic Control, Approach, and Landing System (ATCALS)				
NextGen ATS ADS-B Out Implementation/Accommodation	1	2018	1	2021
NextGen ATS Avionics Security Analysis	1	2018	1	2022
NextGen ATS IMS and Strategic Roadmap Implementation	1	2018	4	2023
NextGen ATS Advancement of Instrument Approach Operations	1	2018	4	2023
NextGen ATS Optimizing Flight Operation	1	2018	4	2023
NextGen ATS UAS Integration With Civil Airspace	1	2018	4	2024
NextGen ATS Surveillance Radar and Automation System Upgrade/D-RAPCON Mode-5 Identification Friend/Foe/Secure Comm Integration	2	2018	4	2019
NextGen ATS Aircraft Expeditionary Launch and Recovery	1	2019	4	2024
NextGen ATS Monitoring Emerging Mandates	1	2019	4	2024
NextGen ATS Optimizing Flight Capabilities	1	2019	4	2024
NextGen ATS Airspace Intorperability	1	2019	4	2024
Notice to Airmen (NOTAMs) Software Upgrade Development	2	2019	2	2023
ATC Training and Technology Study	3	2019	2	2021
Remote Virtual ATC Tower Contract Award (Sep 18)	4	2018	4	2018
Remote Virtual ATC Tower Facility Prep/Installation	1	2019	4	2019
Remote Virtual ATC Tower EOA	4	2019	4	2020
ATCALS Operational Test and Evaluation	1	2018	4	2024
D-RAPCON System Certifications	1	2018	3	2019
D-RAPCON Government Developmental Testing	2	2018	3	2020
D-RAPCON User Operational Assessment	2	2019	2	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305114F / *Air Traffic Control, Approach, and Landing System (ATCALS)*	**Project (Number/Name)** 673587 / *Air Traffic Control Systems*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
D-RAPCON Milestone C - (Jun 19)	3	2019	3	2019
D-RAPCON Pre-Production Refurb/Production Representative Option (Jul 19)	4	2019	4	2019
D-RAPCON Production Decision - (Nov 20)	1	2021	1	2021
Infill Radar Certification Criteria Development	3	2019	2	2020
Infill Radar Certification Validation	3	2020	4	2020
ATC UAS Management Policy/Data Exchange Model Dev	3	2019	2	2020
ATC UAS Management Model Validation	3	2020	4	2020

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305116F / *Aerial Targets*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	20.944	6.683	7.448	0.000	7.448	5.491	1.554	1.584	1.613	Continuing	Continuing
675136: *Target Systems Development*	-	7.418	4.698	3.478	0.000	3.478	5.491	1.554	1.584	1.613	Continuing	Continuing
675336: *QF-16 AST Budget Authority*	-	0.000	1.985	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
675366: *QF-16*	-	13.526	0.000	3.970	0.000	3.970	0.000	0.000	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

Full-scale Aerial Targets assure warfighters' weapon systems perform effectively against real-world enemy fighters and cruise missiles. Aerial Targets support adherence to Public Law Title 10, Section 2366, which requires major systems and munitions programs to conduct live fire survivability and lethality testing before full-rate production. Targets are used to validate operational missile/weapon system effectiveness and fighter operational flight program (OFP) updates. Targets are required for developmental/operational testing for all air-to-air and surface-to-air missiles, and for the F-22A, F-35, F-18, F-16, F-15, and other aircraft. Funding supports simulator development and improvements on the QF-16 Full Scale Aerial Target, BQM-167A Subscale Aerial Target, and updates of Target Control Systems and specialized Target Payload Subsystems for requirements such as: missile scoring, electronic attack and infrared (IR) countermeasures, radar and IR signature augmentation, and chaff and flare dispensing systems. Development is required to evolve aerial targets and target control capabilities to meet current and future threats. Air Force is the Executive Agent for full scale aerial targets.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Aerial Targets weapon system capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force					Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*		R-1 Program Element (Number/Name) PE 0305116F / *Aerial Targets*			
B. Program Change Summary ($ in Millions)	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**
Previous President's Budget	21.295	8.383	7.448	0.000	7.448
Current President's Budget	20.944	6.683	7.448	0.000	7.448
Total Adjustments	-0.351	-1.700	0.000	0.000	0.000
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-1.700			
• 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	-0.351	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

Change Summary Explanation

FY 2019: Congressional mark of -$1.7M for "EA pods under execution"

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305116F / *Aerial Targets*	Project (Number/Name) 675136 / *Target Systems Development*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675136: *Target Systems Development*	-	7.418	4.698	3.478	0.000	3.478	5.491	1.554	1.584	1.613	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Full-scale Aerial Targets, Subscale Aerial Targets, and companion Target Control Systems (TCS) assure the effectiveness and currency of warfighter weapon systems to combat real-world enemy fighters and cruise missiles. The BQM-167A Air Force Subscale Aerial Target (AFSAT) is a reusable jet-powered target aircraft measuring approximately 20 feet long with a mission to simulate threat aircraft for testing and evaluation of surface-to-air, ship-to-air, or air-to-air missiles. The target accomplishes this mission through the use of optional payloads including chaff and flare, electronic attack, and infrared devices. Funding supports continued improvement of overall performance enhancement efforts. Funding supports development, improvements, and updates of target control systems and specialized target payload subsystems for requirements to include but not limited to missile scoring, electronic attack and infrared (IR) countermeasures, radar and IR signature augmentation, and chaff and flare dispensing systems.

Electronic Attack (EA) payload upgrade provides new techniques and capabilities critical to subscales and full-scales to realistically emulate current and emerging foreign threat systems in support of weapons testing.

TCS provides a myriad of sub-systems that, together, deliver the capability to control and track mission aerial targets (full-scale and subscale) and to track a mix of other critical mission participants (to include relay platforms, shooters, and the missile system under test). In this role, TCS ensures an optimum integrated aerial target environment that enhances both weapon system assessments and companion aircrew skills, and the full safety of mission participants throughout the conduct and fulfillment of T&E objectives. Funding supports continued improvement (modernization) of TCS capabilities to effectively meet the multi-service test and evaluation (T&E) demands of current and future warfighter weapon systems.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: AFSAT (BQM-167A) Development	0.000	2.024	3.037
Description: Provide enhancements to AFSAT (BQM-167A) ability to emulate emerging threats in support of weapon testing.			
FY 2019 Plans: Continue AFSAT (BQM-167A) improvement efforts to include enhanced payload capability.			
FY 2020 Plans: Continue ASFAT (BQM-167A) improvement efforts to include enhanced payload capability and future weapon testing with realistic threats per LFTE Title 10 requirements. Efforts include enhancements to gas, aero, power, and payload capabilities.			
FY 2019 to FY 2020 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305116F / *Aerial Targets*	**Project (Number/Name)** 675136 / *Target Systems Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Funding increased due to AFSAT (BQM-167A) related Multi-Payload Control (MPC) enhancement efforts.			
Title: Target Control System ***Description:*** Provide system modernization enhancements to Target Control System Gulf Range Drone Control System, (GRDCS) for command and control and tracking of Aerial Targets. ***FY 2019 Plans:*** Continue system modernization enhancements to include but not limited to GRDCS software updates to support implementing QF-16 and AFSAT enhancements and future TCS capability assessment. ***FY 2020 Plans:*** Continue system modernization enhancements to include but not limited to GRDCS software updates to support implementing QF-16 and AFSAT enhancements and future TCS capability assessments. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding decreased due to completion of the TCS 2025 Capabilities-Based Assessment (CBA).	3.013	1.404	0.441
Title: Digital Radio Frequency Memory (DRFM) ***Description:*** Develop, improve, and update specialized target payload subsystems both software and hardware for requirements to emulate evolving adversary EA, IR, and radar tactics and techniques. These efforts are continuous as new threat intelligence surfaces, and are level of effort projects based on available funding. ***FY 2019 Plans:*** Continue efforts to upgrade existing and develop new EA pod hardware and software used on QF-16 and subscales to emulate evolving adversary EA tactics and techniques. ***FY 2020 Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding decreased due to FY20 prioritization of efforts.	4.405	1.270	0.000
Accomplishments/Planned Programs Subtotals	7.418	4.698	3.478

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APAF 04 Line Item 10TRGT: *Target Drones*	105.841	100.953	130.837	-	130.837	133.454	136.127	138.600	141.095	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305116F / *Aerial Targets*	**Project (Number/Name)** 675136 / *Target Systems Development*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APAF 06 000999: *Initials Spares*	0.596	0.579	0.589	-	0.589	0.601	0.613	0.624	0.635	Continuing	Continuing
• APAF 07 000074: *War Consumables*	4.560	4.599	4.012	-	4.012	4.764	4.859	4.947	5.036	Continuing	Continuing
• APAF 07 Line Item 000075: *Other Production Charges*	19.780	24.269	16.514	-	16.514	16.517	16.795	17.021	17.327	Continuing	Continuing

Remarks

APAF, BA 04: Target Drones 10TRGT - Full Scale and Subscale Aerial Targets assure warfighters' weapon systems will perform effectively against real-world enemy fighters and cruise missiles. Adheres to Public Law title 10, Section 2366 "Live fire/Lethality" developmental/operational test requirements.

APAF, BA 06: Initial Spares/Repair Parts - Aircraft Initial Spares are required to fill the initial pipeline or inventory for all new aircraft systems, including modifications, support equipment, and other production categories. Initial spares include peculiar repairable and consumable components, assemblies, and sub-assemblies that must be available for issues at all levels of supply in time to support newly fielded end items.

APAF, BA 07: War Consumables - AFSAT Rocket-Assisted Take-Off (RATO) requirements executed at Hill AFB. A RATO is used in the initial launch phase to obtain appropriate speed and altitude.

APAF, BA 07: Other Production Charges - ALQ-167 and/or DLQ-9 Electronic Attack (EA) payloads for target drones including support equipment. Payloads emulate threat aircraft electronic countermeasures and jamming capabilities.

D. Acquisition Strategy

The AFSAT acquisition strategy is sole source follow-on with fixed price and time and materials contracts. The Target Control System acquisition strategy includes several small projects to provide enhancements to Target Control System (to include GRDCS) and will be accomplished with other government agencies and contracts as needed. EA Payloads acquisition strategy includes several small projects managed by the US Navy program office to provide enhancements to the target payloads for subscale and full-scale targets.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305116F / *Aerial Targets*	**Project (Number/Name)** 675136 / *Target Systems Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Air Force Subscale Aerial Target (AFSAT) Product Improvements	SS/FFP	Various : CA	-	0.000		2.024	May 2019	3.017	Jan 2020	0.000		3.017	Continuing	Continuing	-
Target Control System	Various	Various: Eglin AFB : FL	-	3.013	Jan 2018	1.401	Jan 2019	0.437	Nov 2019	0.000		0.437	Continuing	Continuing	-
Digital Radio Frequency Memory (DRFM)	Various	Various : Pt Mugu, CA	-	4.405	Dec 2018	1.270	Dec 2018	-		-		-	Continuing	Continuing	-
		Subtotal	-	7.418		4.695		3.454		0.000		3.454	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Air Force Subscale Aerial Target (AFSAT) Program Management Administration (PMA)	Various	Various : Eglin AFB, FL	-	-		-		0.020		-		0.020	Continuing	Continuing	-
Target Control System Program Management Administration (PMA)	Various	Various : Eglin AFB, FL	-	0.000		0.003		0.004		-		0.004	Continuing	Continuing	-
		Subtotal	-	0.000		0.003		0.024		-		0.024	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	7.418		4.698		3.478		0.000		3.478	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305116F / *Aerial Targets*	**Project (Number/Name)** 675136 / *Target Systems Development*

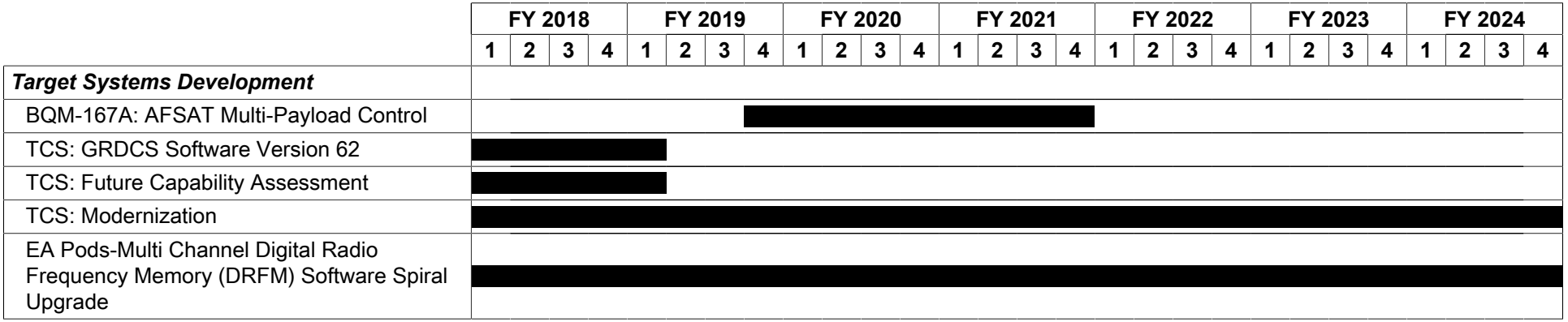

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305116F / *Aerial Targets*	**Project (Number/Name)** 675136 / *Target Systems Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Target Systems Development				
BQM-167A: AFSAT Multi-Payload Control	4	2019	4	2021
TCS: GRDCS Software Version 62	1	2018	1	2019
TCS: Future Capability Assessment	1	2018	1	2019
TCS: Modernization	1	2018	4	2024
EA Pods-Multi Channel Digital Radio Frequency Memory (DRFM) Software Spiral Upgrade	1	2018	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305116F / *Aerial Targets*	Project (Number/Name) 675336 / *QF-16 AST Budget Authority*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675336: *QF-16 AST Budget Authority*	-	0.000	1.985	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This BPAC is an administrative continuation of BPAC 675366: QF-16, and encompasses the same efforts.

A. Mission Description and Budget Item Justification

Full-scale Aerial Targets ensure warfighters' weapon systems perform effectively against real-world enemy fighters and cruise missiles. Aerial Targets support adherence to Public Law Title 10, Section 2366, which requires major systems and munitions programs to conduct live fire survivability and lethality testing before full-rate production. Targets are used to validate operational missile/weapon system effectiveness and fighter operational flight program (OFP) updates. Targets are required for developmental/operational testing for all air-to-air and surface-to-air missiles, and for the F-22A, F-35, F-18, F-16, F-15 aircraft, and other aircraft. Funding supports simulator development and improvements on the QF-16 Full Scale Aerial Target, and updates of Target Control Systems and specialized target payload subsystems for requirements such as: missile scoring, electronic attack and infrared (IR) countermeasures, radar and IR signature augmentation, and chaff and flare dispensing systems. Development is required to evolve QF-16 threat capabilities to meet current and future threats identified by OSD.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: QF-16 Development Program	0.000	1.985	0.000
Description: Provide enhancements to emulate emerging threat in support of weapons testing. ***FY 2019 Plans:*** FY19 funds continue threat realism improvements to improve countermeasures and their control. Conduct studies and analysis on QF-16 Multi Payload control (MPC). FY18 and FY20 funds for this project are located in Project 675366. ***FY 2020 Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funds decreased due to being incorporated correctly into Project 675366.			
Accomplishments/Planned Programs Subtotals	0.000	1.985	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305116F / *Aerial Targets*	**Project (Number/Name)** 675336 / *QF-16 AST Budget Authority*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APAF 04 10TRGT: *Target Drones*	105.841	100.953	130.837	-	130.837	133.454	136.127	138.600	141.095	Continuing	Continuing
• APAF 06 000999: *Initial Spares*	0.596	0.579	0.589	-	0.589	0.601	0.613	0.624	0.635	Continuing	Continuing
• APAF 07 000074: *War Consumables*	4.560	4.599	4.012	-	4.012	4.764	4.859	4.947	5.036	Continuing	Continuing
• APAF 07 000075: *Other Production Charges*	19.780	24.269	16.514	-	16.514	16.517	16.795	17.021	17.327	Continuing	Continuing

Remarks

APAF, BA 04: Target Drones 10TRGT - Full Scale and Subscale Aerial Targets assure warfighter's weapon systems will perform effectively against real-world enemy fighters and cruise missiles. Adheres to Public Law title 10, Section 2366 "Live fire/Lethality" developmental/operational test requirements.

APAF, BA 06: Initial Spares/Repair Parts - Aircraft Initial Spares are required to fill the initial pipeline or inventory for all new aircraft systems, including modifications, support equipment, and other production categories. Initial spares include peculiar repairable and consumable components, assemblies, and sub-assemblies that must be available for issues at all levels of supply in time to support newly fielded end items.

APAF, BA 07: War Consumables - AFSAT Rocket-Assisted Take-Off (RATO) requirements executed at Hill AFB. A RATO is used in the initial launch phase to obtain appropriate speed and altitude.

APAF, BA 07: Other Production Charges - ALQ-167 and/or DLQ-9 Electronic Attack (EA) payloads for target drones including support equipment. Payloads emulate threat aircraft electronic countermeasures and jamming capabilities.

D. Acquisition Strategy

The QF-16 was a competitive contract award, including fixed price incentive development contract with fixed priced production options (Lots 1-5). Planning is in progress to award a sole source follow-on production and sustainment contract to the incumbent for Lots 6-8.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305116F / *Aerial Targets*	Project (Number/Name) 675336 / *QF-16 AST Budget Authority*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
QF-16 Multi-Payload Control	C/Various	The Boeing Company : Saint Louis, MO	-	-		1.985	Aug 2019	-		-		-	Continuing	Continuing	-
		Subtotal	-	-		1.985		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		1.985		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305116F / *Aerial Targets*	**Project (Number/Name)** 675336 / *QF-16 AST Budget Authority*

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
QF-16 Development																												
QF-16 Multi-Payload Control																												

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305116F / *Aerial Targets*	**Project (Number/Name)** 675336 / *QF-16 AST Budget Authority*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
QF-16 Development				
QF-16 Multi-Payload Control	1	2019	1	2021

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305116F / *Aerial Targets*	Project (Number/Name) 675366 / *QF-16*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675366: *QF-16*	-	13.526	0.000	3.970	0.000	3.970	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Full-scale Aerial Targets ensure warfighters' weapon systems perform effectively against real-world enemy fighters and cruise missiles. Aerial Targets support adherence to Public Law Title 10, Section 2366, which requires major systems and munitions programs to conduct live fire survivability and lethality testing before full-rate production. Targets are used to validate operational missile/weapon system effectiveness and fighter operational flight program (OFP) updates. Targets are required for developmental/operational testing for all air-to-air and surface-to-air missiles, and for the F-22A, F-35, F-18, F-16, F-15 and other aircraft. Funding supports simulator development and improvements on the QF-16 Full Scale Aerial Target, and updates of Target Control Systems and specialized target payload subsystems for requirements such as: missile scoring, electronic attack and infrared (IR) countermeasures, radar and IR signature augmentation, and chaff and flare dispensing systems. Development is required to evolve QF-16 threat capabilities to meet current and future threats identified by OSD.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: QF-16 Development Program	13.526	0.000	3.970
Description: Provide enhancements to emulate emerging threat in support of weapons testing.			
FY 2019 Plans: FY19 funds are in Project 675336, which was an administrative extension of this project. FY19 funds continue threat realism improvements for countermeasures and their control. Conduct studies and analysis on QF-16 Radar Cross Section (RCS) and Multi Payload Control (MPC).			
FY 2020 Plans: Continue threat realism improvements for countermeasures and their controls. Complete studies and analysis on QF-16 MPC.			
FY 2019 to FY 2020 Increase/Decrease Statement: Funds increased due to additional efforts for the QF-16 MPC project.			
Accomplishments/Planned Programs Subtotals	13.526	0.000	3.970

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APAF 04 Line Item 10TRGT: *Target Drones*	105.841	100.953	130.837	-	130.837	133.454	136.127	138.600	141.095	Continuing	Continuing
• APAF 06 000999: *Initial Spares*	0.596	0.579	0.589	-	0.589	0.601	0.613	0.624	0.635	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305116F / *Aerial Targets*	**Project (Number/Name)** 675366 / *QF-16*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APAF 07 000074: *War Consumables*	4.560	4.599	4.012	-	4.012	4.764	4.859	4.947	5.036	Continuing	Continuing
• APAF 07 Line Item 00075: *Other Production Charges*	19.780	24.269	16.514	-	16.514	16.517	16.795	17.021	17.327	Continuing	Continuing

Remarks

APAF, BA 04: Target Drones 10TRGT - Full Scale and Subscale Aerial Targets assure warfighter's weapon systems will perform effectively against real-world enemy fighters and cruise missiles. Adheres to Public Law title 10, Section 2366 "Live fire/Lethality" developmental/operational test requirements.

APAF, BA 06: Initial Spares/Repair Parts - Aircraft Initial Spares are required to fill the initial pipeline or inventory for all new aircraft systems, including modifications, support equipment, and other production categories. Initial spares include peculiar repairable and consumable components, assemblies, and sub-assemblies that must be available for issues at all levels of supply in time to support newly fielded end items.

APAF, BA 07: War Consumables - AFSAT Rocket-Assisted Take-Off (RATO) requirements executed at Hill AFB. A RATO is used in the initial launch phase to obtain appropriate speed and altitude.

APAF, BA 07: Other Production Charges - ALQ-167 and/or DLQ-9 Electronic Attack (EA) payloads for target drones including support equipment. Payloads emulate threat aircraft electronic countermeasures and jamming capabilities.

D. Acquisition Strategy

The QF-16 was a competitive contract award, including fixed price incentive development contract with fixed priced production options (Lots 1-5). Planning is in progress to award a sole source follow-on production and sustainment contract to the incumbent for Lots 6-8.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305116F / *Aerial Targets*	Project (Number/Name) 675366 / *QF-16*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Drone Peculiar Equipment	C/Various	The Boeing Company : Saint Louis, MO	-	13.526	Jun 2019	-		-		-		-	Continuing	Continuing	-
QF-16 Multi-Payload Control	Various	The Boeing Company : Saint Louis, MO	-	-		-		3.970	Nov 2019	-		3.970	Continuing	Continuing	-
		Subtotal	-	13.526		-		3.970		-		3.970	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	13.526		0.000		3.970		-		3.970	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305116F / *Aerial Targets*	**Project (Number/Name)** 675366 / *QF-16*

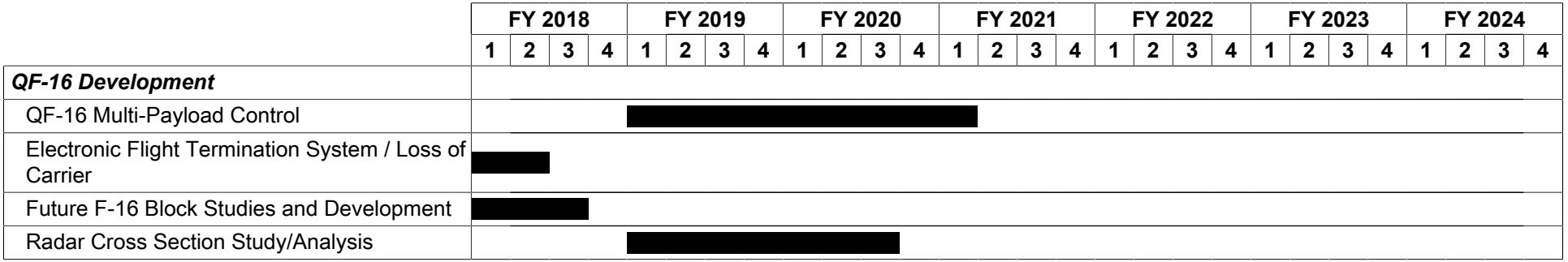

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305116F / *Aerial Targets*	**Project (Number/Name)** 675366 / *QF-16*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
QF-16 Development				
QF-16 Multi-Payload Control	1	2019	1	2021
Electronic Flight Termination System / Loss of Carrier	1	2018	2	2018
Future F-16 Block Studies and Development	1	2018	3	2018
Radar Cross Section Study/Analysis	1	2019	3	2020

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305128F / *Security and Investigative Activities*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	0.400	0.418	0.425	0.000	0.425	0.433	0.442	0.450	0.458	Continuing	Continuing
671931: *TECH SURVEIL COUNTER MEAS EQPT*	-	0.400	0.418	0.425	0.000	0.425	0.433	0.442	0.450	0.458	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Air Force Office of Special Investigations (AFOSI) conducts specialized investigative activities and force protection support for Air Force (AF) commanders worldwide. This assists AF commanders in protecting their people and resources. AFOSI's mission includes investigating criminal matters affecting AF personnel, contract fraud and economic crimes involving AF weapons systems and spare parts, the investigation of environmental crime, counterdrugs, computer intrusion detection and forensic media analysis of computer crimes. This element supports Technical Surveillance Countermeasures (TSCM), Computer Crime Investigations (CCI), and technical support to criminal and counterintelligence investigations and operations conducted by AFOSI. AFOSI's TSCM mission conducts counterintelligence investigations for both AF and DoD facilities and programs in order to deter and detect technical surveillance operations conducted by Foreign Intelligence Services to compromise classified or sensitive information. The purpose of CCI research is to improve AF and DoD Information Operations capability by enhancing AFOSI's ability to deter or prevent spies, hackers, or saboteurs from manipulating, damaging, or stealing sensitive war fighting data or systems. Failing that, to investigate, identify, and prosecute those who do. While most research to meet operational requirements is Operational System Development, there is also research in the category of Engineering and Manufacturing Development due to a need for modifications to present technology. The equipment required to provide technical support to investigations is unique and complex. This equipment must be continually updated to provide state-of-the-art capabilities to detect and neutralize criminal activities targeted against the AF and DoD. In an era of advancing technology, reduced manning, and increasingly high level fraud, environmental crime and computer crime investigations, technical investigative equipment must be continuously updated to enable AFOSI special agents to have the most cost effective and best possible means of thwarting criminal acts. The evolution of a new wave of computer crimes has made AFOSI responsible for the collection, investigative analysis, national level law enforcement coordination, and dissemination of hacker activity and intrusion incidents for the Air Force. AFOSI's computer crime equipment must stay on the leading edge of technology to collect criminal information as well as pursue and apprehend criminals through a global medium. AFOSI must continually update its existing high tech computer surveillance equipment to support ongoing and future investigative operations to identify hackers and hacker groups, as well as potential hostile government activities targeting Air Force communication and control systems. Critical Infrastructure Protection identifies weaknesses in the Air Force Critical infrastructure, highlights critical countermeasures and acquires and deploys cost-effective solutions. The intent is to provide an Air Force-wide review of current infrastructure vulnerabilities; prioritize AF protection planning and integrate with existing programs; identify gaps based on AF needs; direct studies to refine AF requirements.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305128F / *Security and Investigative Activities*

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	0.415	0.418	0.425	0.000	0.425
Current President's Budget	0.400	0.418	0.425	0.000	0.425
Total Adjustments	-0.015	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	-0.015	0.000	0.000	0.000	0.000

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: TSCM	0.400	0.418	0.425	0.000	0.425
Description: These funds will support development of a suite of specialized law enforcement and counterintelligence restricted tools needed to exploit cyberspace, digital media storage and mobile audio/ visual/data communications for the collection of evidence against a wide variety of serious offenses. They will develop next generation Technical Surveillance Countermeasures (TSCM) to defend against emerging foreign technical intelligence capabilities targeting sensitive protected information for exploitation. The concerted efforts of criminal, terrorist and foreign intelligence elements to evade law enforcement and compromise protected systems, all while remaining undetected using the latest technical advances available, require persistent development of tools to defeat their efforts.					
FY 2019 Plans: These funds continue to support the development of a suite of specialized law enforcement and counterintelligence restricted tools needed to exploit cyberspace, digital media storage and mobile audio/visual/ data communications for the collection of evidence against a wide variety of serious offenses and develop next generation Technical Surveillance Countermeasures (TSCM) to defend against emerging foreign technical intelligence capabilities targeting sensitive protected information for exploitation.					
FY 2020 Base Plans:					

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305128F / *Security and Investigative Activities*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
need to meet reqts ***FY 2020 OCO Plans:*** no OCO ***FY 2019 to FY 2020 Increase/Decrease Statement:*** needed to meet requirements					
Accomplishments/Planned Programs Subtotals	0.400	0.418	0.425	0.000	0.425

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

Market Research is accomplished jointly within the DoD, Counterintelligence, and Law Enforcement communities with the various government laboratories and major contractors to identify locations with the ability to develop investigative tools unique to our mission needs. These technologies, capabilities, and limitations of current and future investigative tools is sometimes highly sensitive or classified. Market Research also allows inter-agency coordination and deconfliction to occur, reducing or eliminating duplicitous development efforts. Annually, stakeholders meet to discuss initiatives, challenges and organizational goals to coordinate or consolidate requirements to increase efficiency. Once Market Research and any applicable coordination/deconfliction is completed, acquisition channels are analyzed and selected based on the ability to meet operational and technical security requirements.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305128F / *Security and Investigative Activities*	Project (Number/Name) 671931 / *TECH SURVEIL COUNTER MEAS EQPT*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TSCM R/D #4	MIPR	HQ AFOSI : Quantico, VA	-	0.400	Dec 2017	0.418		-		-		-	Continuing	Continuing	-
		Subtotal	-	0.400		0.418		-		-		-	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TSCM R/D	MIPR	HQ AFOSI : Quantico, VA	-	-		-		0.425		-		0.425	Continuing	Continuing	-
		Subtotal	-	-		-		0.425		-		0.425	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.400		0.418		0.425		-		0.425	Continuing	Continuing	N/A

Remarks

Funds support AFOSI RDTE at the intelligence community's Interagency Test and Evaluation Lab at a secure location to identify, research, develop, test, and evaluate classified and unclassified technical surveillance and countermeasures solutions to emerging operational requirements in support of AFOSI services to protect Air Force and DoD resources.

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305128F / *Security and Investigative Activities*	**Project (Number/Name)** 671931 / *TECH SURVEIL COUNTER MEAS EQPT*

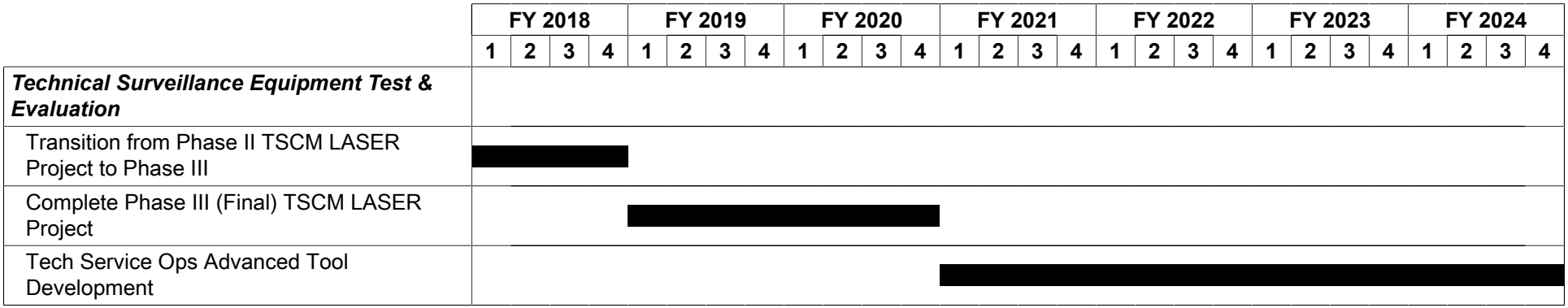

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305128F / *Security and Investigative Activities*	**Project (Number/Name)** 671931 / *TECH SURVEIL COUNTER MEAS EQPT*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Technical Surveillance Equipment Test & Evaluation				
Transition from Phase II TSCM LASER Project to Phase III	1	2018	4	2018
Complete Phase III (Final) TSCM LASER Project	1	2019	4	2020
Tech Service Ops Advanced Tool Development	1	2021	4	2024

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force												Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305145F / *Arms Control Implementation*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	0.000	21.374	54.546	0.000	54.546	76.200	37.600	0.000	0.000	0.000	189.720
674283: *Open Skies Treaty Aircraft Recap*	-	0.000	21.374	54.546	0.000	54.546	76.200	37.600	0.000	0.000	0.000	189.720

A. Mission Description and Budget Item Justification

The Open Skies Treaty permits unarmed overflight of the sovereign territory of 34 signatory nations. The Treaty enhances mutual understanding and confidence by giving all participants, regardless of size, a direct role in gathering information through aerial imaging on military forces and activities of concern. Open Skies is one of the most wide-ranging international arms control efforts to date to promote openness and transparency in military forces and activities.

The Department of Defense is responsible for oversight, implementation of, and compliance with, arms control agreements, including the Open Skies Treaty. The United States Air Force has a requirement to execute missions under the Open Skies Treaty and utilizes two OC-135B aircraft as the observation aircraft. All roles and responsibilities are called out in Presidential Policy Directive 15, "Implementation of the Treaty on Open Skies," Mar 1, 2012. The OC-135B fleet has experienced decreasing mission reliability due to age, difficulties with out-of-production parts, and increased operating costs. Open Skies missions averaged a 65% mission completion rate over the ten-year period from 2007 to 2017 with leading non-mission capable drivers being the engines, fuel system, landing gear, generators, and airframe. Additionally, the OC-135B aircraft's 6,500 km range is insufficient to fully execute mission options within the 96-hour in-country Treaty observation time constraint permitted under Treaty.

The Department of Defense, motivated by operational limitations of the OC-135B experienced during Open Skies missions combined with declining mission capability, prompted program officials to request a Capabilities-Based Assessment in July 2015 to study aircraft issues. The effort which completed in June 2016 indicated that key requirements within the 1992 Open Skies Operational Requirements Document were no longer current, and that the OC-135B had known capability performance gaps in range and mission completion.

In October 2016, the Air Force secured permission to develop a Doctrine, Organization, Training, materiel, Leadership and Education, Personnel, Facilities and Policy Change Recommendation for the Open Skies Treaty Aircraft. The process used a multi-disciplinary High Performance Team to create and validate a series of required capabilities for an Open Skies aircraft, evaluate aircraft that could satisfy the required capabilities, and then consider each of the Doctrine, Organization, Training, materiel, Leadership and Education, Personnel, Facilities and Policy elements as part of a recommended solution. The effort accomplished two main purposes. First, it updated operational requirement and replaced the 1992 Operational Requirements Document to reflect both operational experience and expected Open Skies program needs for the foreseeable future. Second, it recommend an Air Force solution that best satisfied required capabilities within existing materiel solutions. The Joint Capabilities Board adopted the Air Force recommendation directed acquisition of two small airliner class aircraft for the Open Skies Treaty mission to be acquired in a method consistent with the Federal Acquisition Regulation and other applicable guidance, training using existing contractor training facilities, equipment, and curriculum, and a maintenance concept with military personnel performing unit-level maintenance actions with contractor support for parts supply, and supply chain management, performed under a Low Utilization Maintenance Program.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305145F / *Arms Control Implementation*

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	21.374	54.546	0.000	54.546
Total Adjustments	0.000	21.374	54.546	0.000	54.546
• 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	21.374			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	54.546	0.000	54.546

Change Summary Explanation

The FY2020 PB requests funding for the purchase of the second of two planned aircraft to be incrementally funded across the FYDP. The FY 2020 FYDP reflects additional RDT&E funding instead of Procurement funding to comply with Department of Defense Financial Management Policies based on the technical requirements.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305145F / *Arms Control Implementation*	Project (Number/Name) 674283 / *Open Skies Treaty Aircraft Recap*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
674283: *Open Skies Treaty Aircraft Recap*	-	0.000	21.374	54.546	0.000	54.546	76.200	37.600	0.000	0.000	0.000	189.720
Quantity of RDT&E Articles	-	-	-	1	-	1	-	-	-	-		

A. Mission Description and Budget Item Justification

The Open Skies Treaty permits unarmed overflight of the sovereign territory of 34 signatory nations. The Treaty enhances mutual understanding and confidence by giving all participants, regardless of size, a direct role in gathering information through aerial imaging on military forces and activities of concern. Open Skies is one of the most wide-ranging international arms control efforts to date to promote openness and transparency in military forces and activities.

The Department of Defense is responsible for oversight, implementation of, and compliance with, arms control agreements, including the Open Skies Treaty. The United States Air Force has a requirement to execute missions under the Open Skies Treaty and utilizes two OC-135B aircraft as the observation aircraft. All roles and responsibilities are called out in Presidential Policy Directive 15, "Implementation of the Treaty on Open Skies," Mar 1, 2012. The OC-135B fleet has experienced decreasing mission reliability due to age, difficulties with out-of-production parts, and increasing operating costs. Open Skies missions averaged a 65% mission completion rate over the ten-year period from 2007 to 2017 with leading non-mission capable drivers being the engines, fuel system, landing gear, generators, and airframe. Additionally, the OC-135B aircraft's 6,500 km range is insufficient to fully execute mission options within the 96-hour in-country Treaty observation time constraint permitted under Treaty.

The Department of Defense, motivated by operational limitations of the OC-135B experienced during Open Skies missions combined with declining mission capability, prompted program officials to request a Capabilities-Based Assessment in July 2015 to study aircraft issues. The effort which completed in June 2016 indicated that key requirements within the 1992 Open Skies Operational Requirements Document were no longer current, and that the OC-135B had known capability performance gaps in range and mission completion.

In October 2016, the Air Force secured permission to develop a Doctrine, Organization, Training, materiel, Leadership and Education, Personnel, Facilities and Policy Change Recommendation for the Open Skies Treaty Aircraft. The process used a multi-disciplinary High Performance Team to create and validate a series of required capabilities for an Open Skies aircraft, evaluate aircraft that could satisfy the required capabilities, and then consider each of the Doctrine, Organization, Training, materiel, Leadership and Education, Personnel, Facilities and Policy elements as part of a recommended solution. The effort accomplished two main purposes. First, it updated operational requirement and replaced the 1992 Operational Requirements Document to reflect both operational experience and expected Open Skies program needs for the foreseeable future. Second, it recommend an Air Force solution that best satisfied required capabilities within existing materiel solutions. The Joint Capabilities Board adopted the Air Force recommendation directed acquisition of two small airliner class aircraft for the Open Skies Treaty mission to be acquired in a method consistent with the Federal Acquisition Regulation and other applicable guidance, training using existing contractor training facilities, equipment, and curriculum, and a maintenance concept with military personnel performing unit-level maintenance actions with contractor support for parts supply, and supply chain management, performed under a Low Utilization Maintenance Program.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305145F / *Arms Control Implementation*	**Project (Number/Name)** 674283 / *Open Skies Treaty Aircraft Recap*

This effort includes the design, development, and test activities for two OC-135B replacement prototype weapon systems over a planned 24 month period. This effort will modify a Federal Aviation Administration (FAA) certified, commercial-off-the-shelf, small airliner class aircraft. System Development requires structural design, interphone communications systems, flight deck avionics and modification to incorporate the Digital Visual Imaging System (DVIS) system.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Open Skies Treaty Aircraft Recap Development	-	21.374	54.546

Description: The Open Skies System consists of the missionized aircraft (Digital Visual Imaging System sensor suite, flight deck avionics, and crew workstations) and Digital Ground Processing Station.

The budget supports modification and Treaty Certification of two commercial-off-the-shelf, small airliner class OC-135B replacement aircraft. The program includes procurement of two commercial-derivative aircraft and Digital Visual Imaging System kits, design and development for mission system integration (structural design, interphone communications systems, flight deck avionics, and Digital Visual Imaging System hardware), test, and Federal Aviation Administration and Open Skies Treaty certification activities over a planned 24-month period. Additionally, this effort establishes pre-operational support for aircraft, mission systems and Digital Ground Processing Station.

FY 2019 Plans:
Planned Activities: Finalized acquisition strategy, began pre-acquisition activities, Request for Proposal Development, Source Selection, and contract award.

FY 2020 Plans:
Planned Activities: Complete competitive source selection, award a contract. Funds will be used to begin preliminary design for integration of the Digital Visual Imaging System to include hardware, software, aircraft structures, observation windows, interior modifications for operations and sustainment of the DVIS system, communications capabilities (UHF, HF, SATCOM), and sensor operator stations workstations. Funds may also be used for preliminary design of modifications to software integration laboratories, image processing facilities and equipment as a result of aircraft integration design.

Major Milestones:
- Contract Award (Feb 2020)
- Preliminary Design Review

FY 2019 to FY 2020 Increase/Decrease Statement:
The FY 2020 budget reflects the approved Program Office Estimate from the acquisition strategy. This budget reflects the planned purchase of the second aircraft in FY 2020 and the program's use of Research, Development, Test, and Evaluation funding

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305145F / *Arms Control Implementation*	**Project (Number/Name)** 674283 / *Open Skies Treaty Aircraft Recap*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
to comply with the Department of Defense Instruction 7000.14-R, Department of Defense Financial Management Policy and Procedures, based on the program technical requirements.			
Accomplishments/Planned Programs Subtotals	-	21.374	54.546

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APAF 01 C135B0: *C-135B*	-	125.000	-	-	-	-	-	-	-	0.000	125.000

Remarks

D. Acquisition Strategy

The Air Force Milestone Decision Authority approved the Open Skies Treaty Aircraft Recapitalization Materiel Development Decision and Acquisition Strategy on 11 September 2018. This acquisition leverages the rapid fielding pathway authorized by section 804 of the National Defense Authorization Act for Fiscal Year 2016 (Public Law 114-92). The program will award a single supply contract with embedded services for Contractor Logistics Support and Engineering Services. The program will utilize Full and Open Competition under Part 15 and Part 12 of the Federal Acquisition Regulation. The program will procure two new aircraft capable of achieving Open Skies Treaty Missions, integrate two new treaty certified commercial-off-the-shelf Digital Visual Imaging Systems, and perform required Developmental Test, Operational Test, and Treaty Certification Data Gathering. The program will establish Pre-operational Support for aircraft, mission systems and the Digital Ground Processing Station necessary to deliver an aircraft, ready for Treaty Certification, by 2022. The program provides for Engineering Services necessary to support the Treaty Certification process. Contractor Logistics Support elements include worldwide supply chain management, establishment of a Contractor Managed Base Supply, program management, depot maintenance, training services, field support, and engineering services for the aircraft, engines, and mission systems. The program will issue the Request for Proposals by third quarter fiscal year 2019 and award the Development contract by February 2020.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305145F / *Arms Control Implementation*	**Project (Number/Name)** 674283 / *Open Skies Treaty Aircraft Recap*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Development and Demonstration	C/Various	TBD : TBD	-	-		17.264	Feb 2020	43.446	Jun 2020	-		43.446	Continuing	Continuing	-
		Subtotal	-	-		17.264		43.446		-		43.446	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Support Costs	Various	Not specified. : Tinker AFB, OK	-	-		4.110	Apr 2019	11.100	Jan 2020	-		11.100	Continuing	Continuing	-
		Subtotal	-	-		4.110		11.100		-		11.100	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		21.374		54.546		-		54.546	Continuing	Continuing	N/A

Remarks

Government Support Cost include costs related to program office travel and government led test.

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305145F / *Arms Control Implementation*	**Project (Number/Name)** 674283 / *Open Skies Treaty Aircraft Recap*

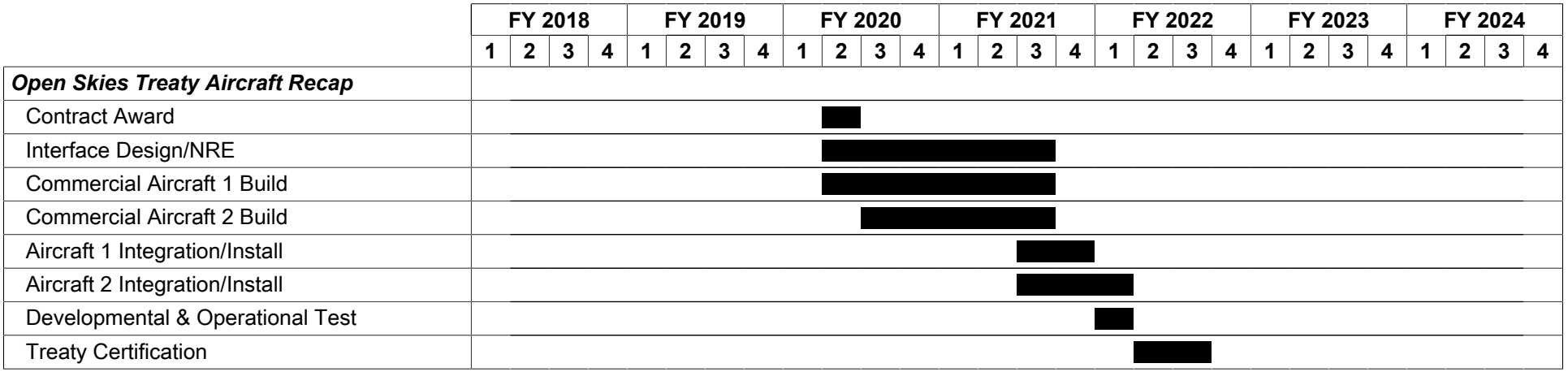

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305145F / *Arms Control Implementation*	**Project (Number/Name)** 674283 / *Open Skies Treaty Aircraft Recap*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Open Skies Treaty Aircraft Recap				
Contract Award	2	2020	2	2020
Interface Design/NRE	2	2020	3	2021
Commercial Aircraft 1 Build	2	2020	3	2021
Commercial Aircraft 2 Build	3	2020	3	2021
Aircraft 1 Integration/Install	3	2021	4	2021
Aircraft 2 Integration/Install	3	2021	1	2022
Developmental & Operational Test	1	2022	1	2022
Treaty Certification	2	2022	3	2022

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305146F / *Defense Joint Counterintelligence Activities*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	4.520	3.845	6.858	0.000	6.858	6.864	6.873	6.881	6.873	Continuing	Continuing
671931: *TECH SURVEIL COUNTER MEAS EQPT*	-	4.520	3.845	6.858	0.000	6.858	6.864	6.873	6.881	6.873	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Technical Surveillance Countermeasures (TSCM) develops future technologies capable of thwarting advanced, hostile force technical capabilities. The technologies will provide secure environments for austere mission planning locations and theater commander centers, and will collect information for CI operations in support of DoD and AF requirements.

Cyber CI enables the Air Force Office of Special Investigations to detect and deter covert activities conducted by Foreign Intelligence Entities seeking to compromise classified or sensitive information in cyberspace. The technologies provided will provide state of the art capabilities to detect and neutralize criminal activities targeted against sensitive and classified AF and DoD information and activities.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	3.867	3.845	3.852	0.000	3.852
Current President's Budget	4.520	3.845	6.858	0.000	6.858
Total Adjustments	0.653	0.000	3.006	0.000	3.006
• 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	0.653	0.000	3.006	0.000	3.006

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305146F / *Defense Joint Counterintelligence Activities*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Technical Surveillance Countermeasures (TSCM) ***Description:*** TSCM will develop future technologies capable of thwarting advanced, hostile force technical capabilities. They will be developed to provide secure environments to austere mission planning locations, theater commander centers, and will collect information for counterthreat operations in support of DoD and AF requirements. ***FY 2019 Plans:*** Continue advancement of BLUE LANCER for the collection/exploitation of evidence against a wide variety of serious offenses. Funds will also be used to develop next generation Technical Surveillance Countermeasures (TSCM) tools to defend against emerging foreign technical intelligence capabilities targeting sensitive protected information for exploitation. ***FY 2020 Plans:*** Continue advancement of BLUE LANCER for the collection/exploitation of evidence against a wide variety of serious offenses. Funds will also be used to develop next generation Technical Surveillance Countermeasures (TSCM) tools to defend against emerging foreign technical intelligence capabilities targeting sensitive protected information for exploitation. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to inflation.	0.367	0.371	0.378
Title: Cyber Counterintelligence Pilot ***Description:*** N/A ***FY 2019 Plans:*** Continue R&D for new iterations of Cyber CI/COPPER CASTLE to address advancements in cyber domain, in order to neutralize foreign intelligence entities from stealing and exploiting sensitive DoD information. ***FY 2020 Plans:*** Continue R&D for new iterations of Cyber CI/COPPER CASTLE to address advancements in cyber domain, in order to neutralize foreign intelligence entities from stealing and exploiting sensitive DoD information. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Additional 3600 funds were accepted in the FY20 POM for 35146F to enhance Cyber CI.	4.153	3.474	6.480
Accomplishments/Planned Programs Subtotals	4.520	3.845	6.858

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305146F / *Defense Joint Counterintelligence Activities*

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• O&M 35146F: *Defense Joint Counterintelligence Program*	46,411.000	45,925.000	57,429.000	-	57,429.000	61,430.000	64,082.000	66,005.000	67,312.000	Continuing	Continuing

Remarks

E. Acquisition Strategy

Defense Joint Counterintelligence Program TSCM funds will be obligated on competitively awarded contracts. Cyber counterintelligence (CI) funding will be obligated on an existing Air Force contract with MIT/Lincoln Labs.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305146F / *Defense Joint Counterintelligence Activities*	**Project (Number/Name)** 671931 / *TECH SURVEIL COUNTER MEAS EQPT*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Naval Research Lab	MIPR	Navy/Air Force : Williamsburg, VA	-	0.367	Dec 2018	0.371	Jan 2019	0.378	Jan 2020	-		0.378	Continuing	Continuing	-
MIT/Lincoln Labs	RO	Air Force : Lexington, MA	-	4.153	Mar 2018	3.474	Mar 2019	6.480	Jan 2020	-		6.480	Continuing	Continuing	-
		Subtotal	-	4.520		3.845		6.858		-		6.858	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	4.520		3.845		6.858		-		6.858	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305146F / *Defense Joint Counterintelligence Activities*	**Project (Number/Name)** 671931 / *TECH SURVEIL COUNTER MEAS EQPT*

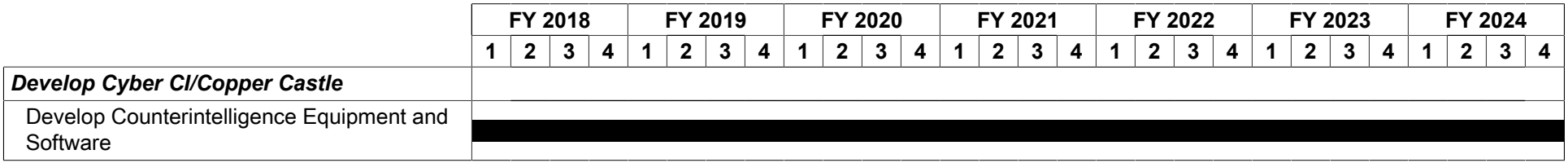

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305146F / *Defense Joint Counterintelligence Activities*	**Project (Number/Name)** 671931 / *TECH SURVEIL COUNTER MEAS EQPT*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Develop Cyber CI/Copper Castle				
Develop Counterintelligence Equipment and Software	1	2018	4	2024

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305179F / *Integrated Broadcast Service (IBS)*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	0.000	0.000	8.728	0.000	8.728	8.880	9.064	9.229	9.395	Continuing	Continuing
674779: *Integrated Broadcast Service (IBS)*	-	0.000	0.000	8.728	0.000	8.728	8.880	9.064	9.229	9.395	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In FY2020 Integrated Broadcast Services (IBS) efforts funded in PE1203179F in FY2018 and FY2019, transferred to PE0305179F due to realignment of IBS to Major Force Program 03, Intelligence and Communication.

The IBS fulfills the warfighter's requirements for worldwide threat warning and situational awareness information with timely production and simultaneous dissemination of Intelligence, Surveillance, and Reconnaissance (ISR) derived combat information. It also provides target tracking data to support threat avoidance, targeting, force protection, and situational awareness. This information is continually refined in near real time by strategic, operational and tactical sensors.

IBS is comprised of the following:
- A Common Interactive Broadcast (CIB) on UHF (Ultra High Frequency) satellite channel using a Common Message Format (CMF) and a Military Standard (MIL-STD) Demand Assigned Multiple Access (DAMA) compliant waveform and Line of Sight (LOS) using the Wideband Networking Waveform (WNW) and Joint Tactical Terminal (JTT).
- IBS-Network Services (IBS-NS) includes two Global IBS Network Servers (GINS) and four Theater Interface Nodes (TINs) to support the geographic Combatant Commanders (COCOMs), all built to validated warfighter requirements.
-- Two GINS receive data from each theater and integrate this data into a worldwide picture available to all network/broadcast users.
-- Four regional TINs allow local and out-of-theater users (not directly receiving IBS broadcast) to receive the CIB information broadcast. Additionally, the TIN will receive and inject data into the CIB for producers without access to the theater CIB.

This PE funds:
- Development/upgrades of IBS (IBS-NS, CIB, and CMF)
This project will identify and implement an open, scalable system architecture that will accommodate growth as the virtual world grows and cyber operations change.

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

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305179F / *Integrated Broadcast Service (IBS)*

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	8.728	0.000	8.728
Total Adjustments	0.000	0.000	8.728	0.000	8.728
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	8.728	0.000	8.728

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Development/upgrades of the Integrated Broadcast Service (IBS-NS, CIB, and CMF)	-	-	6.800
Description: Development/upgrades of the IBS (IBS-NS, CIB, and CMF). ***FY 2020 Plans:*** - Will continue to synchronize and integrate with DOD Intelligence Community (IC) Cloud as a potential producer/consumer; the capability will provide a long term searchable data store for IBS information. - Will continue to upgrade the IBS Enterprise-level real-time and analytic views on Global and COCOM watch floors; further integrate uplink sites with associated TIN by reducing equipment overhead and streamlining data flows - Will continue to upgrade volumetric increase to provide ten times performance enhancement to throughput, storage and replay to address message volume; this will increase the enterprise output to 100M messages per day			

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305179F / *Integrated Broadcast Service (IBS)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Will continue to provide resilience to the IBS CIB UHF Broadcast by utilizing the Mobile User Objective System (MUOS) Wideband Code Division Multiple Access (WCDMA) SATCOM payload supporting the receipt of IBS on 1st generation MUOS terminals - Will continue to upgrade and connect the Combatant Command (COCOM) J2 CIB planning function with the COCOM J6 Integrated Waveform planning function - Will continue to upgrade the CIB Planning Tool and IBS-NS capability at the COCOMs to allow automated planning to occur for active producers - Will continue development of the IBS Thin Client, which provides a light weight application to receive IBS information on mobile devices - Will continue development of the CIB MUOS Group Integration - Many to Many, which achieves IBS Over the Air requirements on the MUOS - WCDMA payload - Will continue to upgrade the P5 system health and welfare status at the COCOMs to include Alternate Path status update messages -- Will continue to upgrade the resiliency of IBS to include polar coverage - Will continue to upgrade and transition current classified dissemination path to new architecture and enable SCI-level dissemination of IBS data - Will continue enhancement of uplink sites to handle operational surge increases - Will continue to upgrade the monitoring and control tools to assist in assured dissemination tasks at COCOM uplink watch sites, development and fielding of Downlink Monitoring Element (DME) ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Prior year funding captured in PE1203179F			
Title: Enterprise System Engineering ***Description:*** Enterprise Systems Engineering/CMF Integration/CIB Integration	-	-	0.900

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305179F / *Integrated Broadcast Service (IBS)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY 2020 Plans: - Will continue Enterprise Systems Engineering/CMF/CIB Integration ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Prior year funding captured in PE1203179F			
Title: Test & Evaluation ***Description:*** Test & Evaluation of the IBS System ***FY 2020 Plans:*** Will conduct Test and Evaluation activities for components of the IBS-NS system/subsystems ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Prior year funding in PE1203179F	-	-	1.028
Accomplishments/Planned Programs Subtotals	-	-	8.728

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• RDTE 07 1203179F: *Integrated Broadcast Service (IBS)*	8.747	8.568	-	-	-	-	-	-	-	0.000	17.315
• SPAF 01 IBS000: *Integ Broadcast Service*	-	16.445	-	-	-	-	-	-	-	0.000	16.445
• OPAF 03 832070: *Intelligence Comm Equipment*	17.270	-	16.743	0.000	16.743	17.134	17.341	17.667	17.985	Continuing	Continuing

Remarks

E. Acquisition Strategy

IBS is in the PEO Battle Management portfolio and executed by AFLCMC/HBG.
IBS uses an Adaptive Life-cycle approach that provides incremental improvement and new capability in 90-day cycles.
For contracting efforts, a Single Award IDIQ contract with multiple task orders was awarded to CACI International Inc.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305179F / *Integrated Broadcast Service (IBS)*	**Project (Number/Name)** 674779 / *Integrated Broadcast Service (IBS)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
IBS (IBS-NS, CIB, and CMF) Development Upgrades	Various	CACI/OGA/Various : Fairfax, VA	-	-		-		7.068	Nov 2019	-		7.068	Continuing	Continuing	-
		Subtotal	-	-		-		7.068		-		7.068	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Interoperability and Development Testing	MIPR	JITC : Ft Hauchuca, AZ	-	-		-		0.500	Oct 2019	-		0.500	Continuing	Continuing	-
Responsible Test Organization (RTO)	PO	46th Test Sqn : Eglin, AFB, FL	-	-		-		0.300		-		0.300	Continuing	Continuing	-
		Subtotal	-	-		-		0.800		-		0.800	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management/ Engineering Support	C/CPFF	Credence : Warner Robins, GA	-	-		-		0.160	Oct 2019	-		0.160	Continuing	Continuing	-
Enterprise Engineering/ CMF Integration/CIB Integration	SS/CPFF	L3 Comm IS : Greenville, TX	-	-		-		0.700	Nov 2019	-		0.700	Continuing	Continuing	-
		Subtotal	-	-		-		0.860		-		0.860	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		0.000		8.728		-		8.728	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305179F / *Integrated Broadcast Service (IBS)*	**Project (Number/Name)** 674779 / *Integrated Broadcast Service (IBS)*

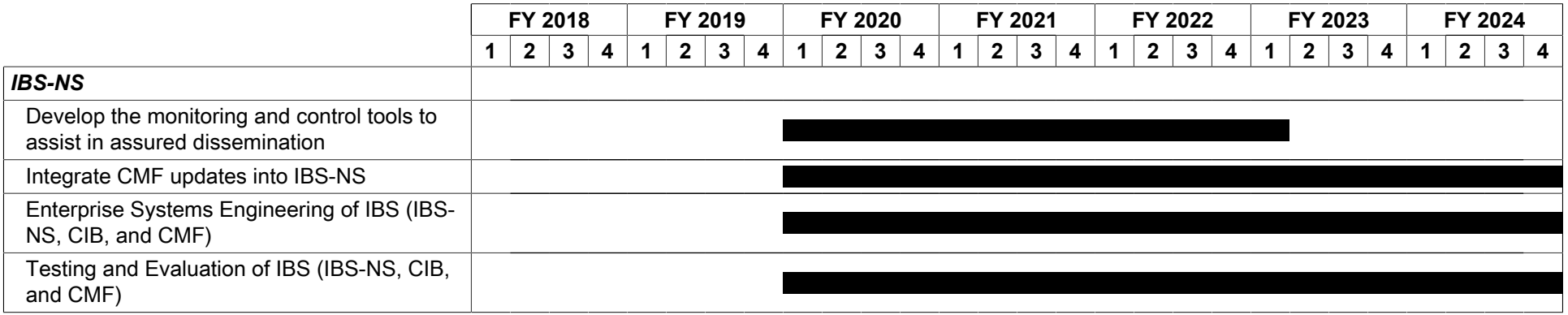

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305179F / *Integrated Broadcast Service (IBS)*	**Project (Number/Name)** 674779 / *Integrated Broadcast Service (IBS)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
IBS-NS				
Develop the monitoring and control tools to assist in assured dissemination	1	2020	1	2023
Integrate CMF updates into IBS-NS	1	2020	4	2024
Enterprise Systems Engineering of IBS (IBS-NS, CIB, and CMF)	1	2020	4	2024
Testing and Evaluation of IBS (IBS-NS, CIB, and CMF)	1	2020	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305202F / *Dragon U-2*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	34.486	87.618	38.939	0.000	38.939	18.694	18.347	19.849	20.206	Continuing	Continuing
674820: *Sensor Development*	-	34.486	87.618	38.939	0.000	38.939	18.694	18.347	19.849	20.206	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The U-2S Dragon Lady platform is a high-demand/low-density aircraft equipped with state-of-the-art sensor and data link systems providing mission essential Intelligence, Surveillance, and Reconnaissance (ISR) to the Combatant Commands, Joint and Combined forces, and the IC community in peacetime and wartime. The program supports core missions such as Sensitive Reconnaissance Operations (outlined in CJCSI 3250.01) in addition to other missions that include execution of CCMD OPLANs and CONPLANs, Humanitarian Assistance/Disaster Response (HADR), Counter-Insurgency (COIN) operations and third-party treaty verification/ monitoring via the OLIVE HARVEST mission.

The Air Force continues to invest and modernize the U-2 program in the 2020 President's Budget by addressing reliability, maintainability, supportability, diminishing manufacturing sources/ material shortages (DMS/MS), flight test, safety issues, and integration of capability development activities in support of the broader ISR portfolio. RDT&E efforts will address sustainment, modification, and modernization of sensors and associated mission equipment, and focus on integrating/expanding platform capabilities within the larger ISR portfolio; these efforts include (but are not limited to) ASARS 2B/C, avionics and navigation tech refresh, mission planning software and infrastructure upgrades, modernization of aircraft data links, next generation SIGINT, and developing a quick reaction capability (QRC), enabling improved collection against emerging threats and capabilities.

Additionally, the U-2 program will continue to prioritize emergent and/or experimental RDT&E efforts designed to mitigate the rapidly evolving combat environment (e.g. electromagnetic requirements) in order to maintain safety and operational relevance through current and future U-2 operating locations.

Currently, the U-2 Program provides funding for an Advanced Synthetic Aperture Radar System (ASARS) acquisition effort. This effort will design, fabricate, integrate, and demonstrate system capability enhancements for a high altitude deep look SAR system. This mitigates a Diminishing Manufacturing Supply and Material Shortages (DMSMS) issue with the current U-2 SAR sensor.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305202F / *Dragon U-2*

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	34.486	70.618	38.939	0.000	38.939
Current President's Budget	34.486	87.618	38.939	0.000	38.939
Total Adjustments	0.000	17.000	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	17.000			
• 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

FY16 increase across FYDP due to AF decision to rephase U-2 divestiture to FY19.

FY17 increase to address DMSMS issues in the program.

FY18 and FY19 increase due to the retention of the U-2. Addresses prudent acquisition efforts to address safety-of-flight and DMSMS issues. +17M Congressional add for EO/IR upgrade

FY20 base decrease reflects beginning of program stabilization following divestiture decisions. FY20 funding more accurately reflects future program costs. Continuing to address safety-of-flight and DMSMS issues.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: U-2 Aircraft Update Block 20.1	23.488	40.498	38.389
Description: Aircraft sustainment and/or enhancement development includes activities such as, but not limited to, trade studies, analysis, preliminary system engineering, system and subsystem testing or demonstrations, sensor specification development, avionics system upgrades, emergency egress system sustainability and suitability effort, airframe Loads and Environment Spectra Survey (L/ESS) Compliance and Flight Data Recorder Installation, mission planning system migration, navigation system and stellar tracker initiatives, Open Mission Systems and Unmanned Aerospace Systems Command and Control Standard Initiative (OMS/UCI) standards compliance, GPS technical refresh, helmet and Full Pressure Suit technical refresh, and tactical data-link (L-16, IBS, IFDL, MADL, etc.) design and integration.			
FY 2019 Plans:			

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305202F / *Dragon U-2*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY 19 continues to support sustainment and/or enhancement development including activities such as, but not limited to, trade studies, analysis, preliminary system engineering, system and subsystem testing or demonstrations, sensor specification development, avionics system upgrades, emergency egress system sustainability and suitability effort, airframe Loads and Environment Spectra Survey (L/ESS) Compliance and Flight Data Recorder Installation, mission planning system migration, navigation system and stellar tracker initiatives, advanced and agile systems, Open Mission Systems and Unmanned Aerospace Systems Command and Control Standard Initiative (OMS/UCI) standards compliance, GPS technical refresh, helmet and Full Pressure Suit technical refresh, and tactical data-link (L-16, IBS, IFDL, MADL, etc.) design and integration. ***FY 2020 Plans:*** Aircraft sustainment and/or enhancement development includes activities such as, but not limited to, trade studies, analysis, preliminary system engineering, system and subsystem testing or demonstrations, sensor specification development, avionics system upgrades, emergency egress system sustainability and suitability effort, airframe Loads and Environment Spectra Survey (L/ESS) Compliance and Flight Data Recorder Installation, mission planning system software and infrastructure migration, navigation system and stellar tracker initiatives, advanced and agile systems, Open Mission Systems and Unmanned Aerospace Systems Command and Control Standard Initiative (OMS/UCI) standards compliance, GPS technical refresh, helmet and Full Pressure Suit technical refresh, quick reaction capability (QRC) development, enhanced communications/SIGINT system demo and development, and tactical data-link (L-16, IBS, IFDL, MADL, etc.) design and integration. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY20 funding continues to address sustainment issues in the platform, while maximizing RDT&E within the aircraft mod categories. FY20 base plans are being addressed with reduction from FY19 to FY20 base.			
Title: U-2 Payload Update Block 20.1 ***Description:*** Aircraft payload development supports sustainment and/or enhancement development includes activities such as, but not limited to, trade studies, analysis, preliminary system engineering, system and subsystem testing or demonstrations, sensor specification development, Advanced Synthetic Aperture Radar System (ASARS) development and test, SIGINT and multi-spectral sensor technical refresh integration and test, defensive systems, sensor range improvements, strategic and tactical data link (L-16, IBS, IFDL, MADL, etc.) design and integration. ***FY 2019 Plans:*** FY19 will continue to support payload sustainment and/or enhancement activities such as, but not limited to, ASARS development, integration and test, defensive systems, datalinks, avionics technical refresh, SIGINT and multi-spectral sensor technical refresh, advanced and agile payloads, Optical Bar Camera technical refresh, sensor range improvements, and associated ground support equipment.	10.998	47.120	0.550

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305202F / *Dragon U-2*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Counters emergent threats in the low band spectrum for detection, display and defeat by the AN/ALQ-221 Low Band (LB) subsystem in order to allow U-2 flight ops in moderately contested environments. Requirements will be met with two system modifications: an Advanced Threat Systems modification and a Continuous Power wave Amplifier (CWPA) modification. This is the development work for follow on FY19 procurement of 15 kits + spares. Additional information is available via classified means. ***FY 2020 Plans:*** In FY20, the majority of planned RDT&E base funding will fall under that aircraft mod category. ACQ manager and HAF U-2 PEM have the authority to adjust funding between categories as mission and threat environment evolves. Payload mod funding will be used to integrate ASARS-2B radar onto the platform. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY20 funding reflects a shift in RDT&E focus toward the aircraft mod category.			
Accomplishments/Planned Programs Subtotals	34.486	87.618	38.939

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

N/A

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305202F / *Dragon U-2*	Project (Number/Name) 674820 / *Sensor Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ASARS Phase 1 Enhancements Design	SS/CPFF	Raytheon/Lockheed Martin : El Segundo, CA	-	-		-		-		-		-	Continuing	Continuing	-
ASARS Phase 2 Integration & Demonstration	SS/CPIF	Raytheon/Lockheed Martin Aeronautics : El Segundo, CA	-	-		0.520	Mar 2019	0.550	Dec 2018	-		0.550	Continuing	Continuing	-
Flight Test Support	SS/CPFF	Lockheed Martin Aeronautics : Palmdale, CA	-	-		-		-		-		-	Continuing	Continuing	-
Ground Support Equipment	SS/CPFF	L3 Communications : Salt Lake City, UT	-	10.998	Nov 2017	-		-		-		-	Continuing	Continuing	-
Navigation System	SS/CPFF	Lockheed Martin Aeronautics : Palmdale, CA	-	4.734	Dec 2017	6.000	Mar 2019	-		-		-	Continuing	Continuing	-
Emergency Egress System Sustainability and Suitability Effort	SS/CPFF	Lockheed Martin Aeronauti : Palmdale, CA	-	10.111	Jul 2018	16.665	Apr 2019	5.738	Feb 2020	-		5.738	Continuing	Continuing	-
Avionics Technical Refresh	SS/CPFF	LMA : Palmdale, CA	-	-		11.234	Apr 2019	16.500	Jan 2020	-		16.500	Continuing	Continuing	-
Loads and Environment Spectra Survey (L/ESS) Compliance and Flight Data Recorder Installation	SS/CPFF	LMA : Palmdale, CA	-	8.643	Jan 2018	7.500	Jun 2019	6.000	Dec 2019	-		6.000	Continuing	Continuing	-
Electro-Optical/Infrared Sensor Technical Refresh	SS/CPFF	Lockheed Martin Aeronautics : Palmdale, CA	-	-		24.500	Apr 2019	-		-		-	Continuing	Continuing	-
Mission Planning Software Technical Refresh	TBD	TBD : TBD	-	-		7.099	Apr 2019	6.096	Dec 2019	-		6.096	Continuing	Continuing	-
Electronic Warfare Suite (EWS) Advanced Threat	SS/CPFF	BAE : Nashua, NY	-	-		14.100		4.055	Jan 2020	-		4.055	0.000	18.155	22.100
		Subtotal	-	34.486		87.618		38.939		-		38.939	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305202F / *Dragon U-2*	**Project (Number/Name)** 674820 / *Sensor Development*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Office Support	C/FFP	Not specified. : GA	-	-		-		-		-		-	Continuing	Continuing	-
		Subtotal	-	-		-		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	34.486		87.618		38.939		-		38.939	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305202F / *Dragon U-2*	**Project (Number/Name)** 674820 / *Sensor Development*

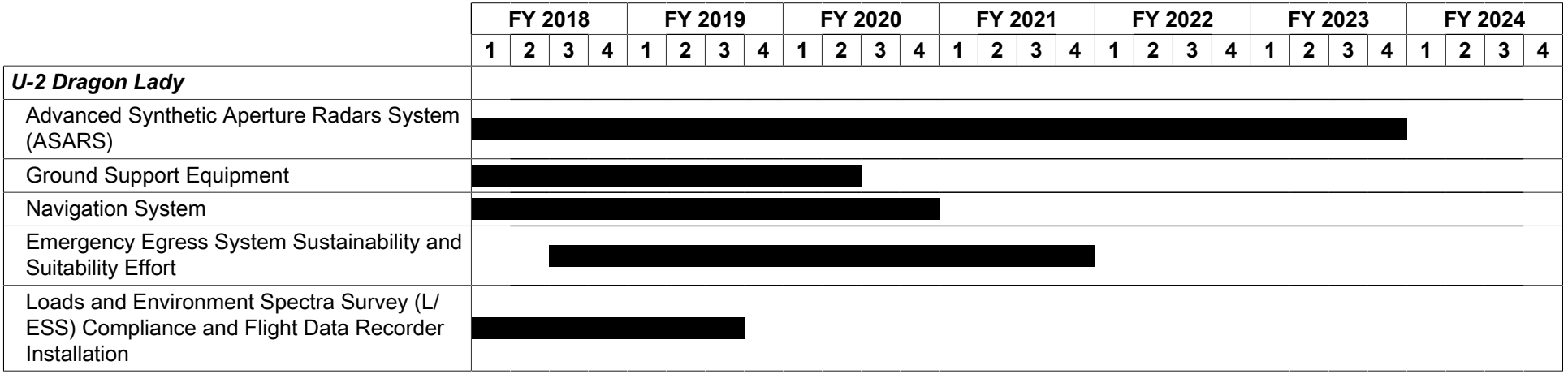

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305202F / *Dragon U-2*	**Project (Number/Name)** 674820 / *Sensor Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
U-2 Dragon Lady				
Advanced Synthetic Aperture Radars System (ASARS)	1	2018	4	2023
Ground Support Equipment	1	2018	2	2020
Navigation System	1	2018	4	2020
Emergency Egress System Sustainability and Suitability Effort	3	2018	4	2021
Loads and Environment Spectra Survey (L/ESS) Compliance and Flight Data Recorder Installation	1	2018	3	2019

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305205F / *Endurance Unmanned Aerial Vehicles*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	40.000	15.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
67A026: *MAGIC*	-	40.000	15.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Medium Altitude Global ISR and Communications (MAGIC) project was an Air Force led technology and concept development to demonstrate the ability for a Remotely Piloted Aircraft (RPA) to stay airborne in the medium altitude structure for a multiple day duration mission with a minimum of 1,000 pounds payload capacity of intelligence, surveillance and reconnaissance sensor systems. The MAGIC concept was initiated by OSD/DDR&E in FY 2010 in response to the Combatant Commanders ranking this type of initiative as the highest priority for a Joint Concept and Technology Demonstration (JCTD). In FY 2011, the Air Force accepted this initiative as the sponsor and MAGIC was subsequently removed from consideration as a JCTD and transitioned into the Air Force as a developmental project.

The MAGIC project was intended to provide the USAF with data regarding sensor and aircraft performance parameters at a multiple day duration at medium altitude flight. The objectives laid out in the JCTD competition and selection of Aurora Flight Sciences' Orion RPA for the long endurance demonstration was managed by the 645th Aeronautical Systems Group (AESG).

In FY 2010, OSD/DDR&E (now ASD/R&E) provided $5M of initial funding to AFRL to initiate the MAGIC project. In FY 2011, ASD/R&E provided an additional $5M to keep the MAGIC project development moving forward. The Air Force provided $10M of FY 2011. Congressional Adds of $19M in FY 2012, $50M in FY 2013 and $20M in FY 2015, provided the program manager with the funding for the continuation of the Orion RPA development and initiation of the three phase flight testing series. Congressional adds of $5M in FY 2016, $50M in FY 2017 and $40M in FY 2018, continues the Orion Unmanned Aerial System (UAS) spiral development of a long endurance UAS that meets airworthiness and cybersecurity requirements, and provides a minimum interoperability and mission capability.

Orion RPA flight test series and demonstrations were accomplished at Naval Air Weapons Station (NAWS) China Lake, CA between August 2013 and March 2015. The objectives to test/demonstrate basic air vehicle performance, expansion of the flight characteristic envelope and a multiple day sortie and integration of a nominal sensor payload, were successfully accomplished on the prototype (Block 0) Orion RPA in a controlled environment, non-representative of an operational setting. Subsequent development efforts concentrated on the validation of the Orion RPA system requirements and concept design/specifications for a follow-on air vehicle (Block 1) capable of operational deployment in the event that the Air Force chooses the Orion RPA as a quick reaction capable system for a theater of operation or a program of record. Currently, there is no validated requirement for the Orion RPA.

A Congressional Add of $15M in FY 2019 completes flight software development, air vehicle system and ground test and begins performance characterization flight test.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305205F / *Endurance Unmanned Aerial Vehicles*

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	40.000	15.000	0.000	0.000	0.000
Total Adjustments	40.000	15.000	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	40.000	15.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2018	FY 2019
Project: 67A026: *MAGIC*		
Congressional Add: *MAGIC*	40.000	15.000
Congressional Add Subtotals for Project: 67A026	40.000	15.000
Congressional Add Totals for all Projects	40.000	15.000

Change Summary Explanation

$15M of FY 2019 funding was laid in as part of a Congressional add

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019
Congressional Add: MAGIC	40.000	15.000
FY 2018 Accomplishments: - Achieved preliminary and critical system design - Completed structural certification testing of air vehicle		

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305205F / *Endurance Unmanned Aerial Vehicles*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019
- Completed components assembly - Completed initial power-on checks in preparation for air vehicle ground test and performance characterization flight test. ***FY 2019 Plans:*** - Completes flight software development, air vehicle system and ground test - Begins performance characterization flight test		
Congressional Adds Subtotals	40.000	15.000

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

There is currently no validated requirement for the Orion RPA. The concept for the Air Force to develop a long endurance, persistent ISR capability for the Combatant Commanders was an outgrowth of a JCTD started in FY 2010. Previous development efforts included: completion of studies analysis, development of a prototype air vehicle (Block 0), bench testing of engines and other aircraft components, ground continuity testing of select avionics, flight controls, and engine components, slow and high speed ground taxiing and a full flight series testing of the Orion RPA capabilities to include a multiple day, long duration flight demonstration. Starting with a portion of the FY 2015 funds, Congressional adds have continued hardware and software engineering and development efforts, while working towards operational airworthiness and cybersecurity standards, and mission requirements for a deployable air vehicle (Block 1).

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305205F / *Endurance Unmanned Aerial Vehicles*	**Project (Number/Name)** 67A026 / *MAGIC*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MAGIC Block 1 Initial Design and Development	SS/CPFF	Aurora : Manassas, VA	-	39.900	Feb 2019	-		-		-		-	Continuing	Continuing	39.900
MAGIC Block 1 Design and Development Completion	SS/CPFF	Aurora : Manassas, VA	-	-		11.900	Aug 2019	-		-		-	Continuing	Continuing	11.900
		Subtotal	-	39.900		11.900		-		-		-	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMA	Allot	645 AESG : Dayton, OH	-	0.100	Mar 2019	-		-		-		-	Continuing	Continuing	0.100
PMA, Final Block 1 Support	Allot	645 AESG : Dayton, OH	-	-		3.100	Mar 2020	-		-		-	Continuing	Continuing	3.100
		Subtotal	-	0.100		3.100		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	40.000		15.000		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305205F / *Endurance Unmanned Aerial Vehicles*	**Project (Number/Name)** 67A026 / *MAGIC*

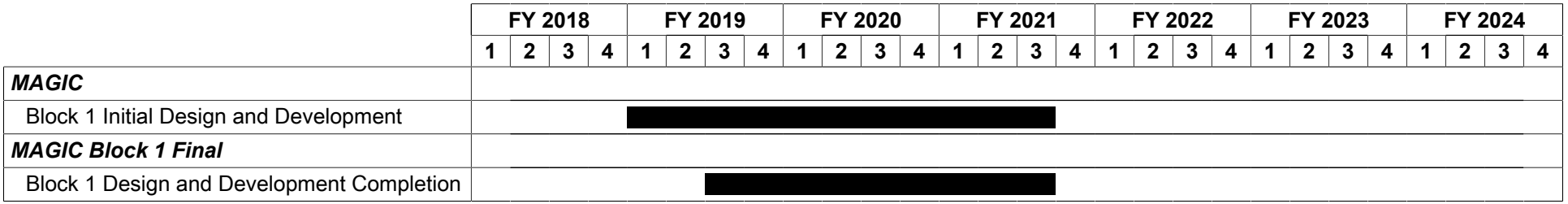

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305205F / *Endurance Unmanned Aerial Vehicles*	**Project (Number/Name)** 67A026 / *MAGIC*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
MAGIC				
Block 1 Initial Design and Development	1	2019	3	2021
MAGIC Block 1 Final				
Block 1 Design and Development Completion	3	2019	3	2021

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305206F / *Airborne Reconnaissance Systems*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	19.450	195.334	122.909	0.000	122.909	73.719	66.459	67.980	43.444	Continuing	Continuing
674818: *Imaging and Targeting Support*	-	1.021	30.295	29.729	0.000	29.729	51.402	51.092	51.411	31.728	Continuing	Continuing
674820: *Sensor Development*	-	0.000	43.681	82.724	0.000	82.724	9.191	0.000	0.000	0.000	0.000	135.596
675092: *JTC/SIL MUSE*	-	3.429	3.454	3.521	0.000	3.521	3.580	3.653	3.720	3.786	Continuing	Continuing
675291: *Gorgon Stare*	-	15.000	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
675382: *Wide Area Motion Imagery (WAMI)**	-	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.001	Continuing	Continuing
676025: *Data Compression*	-	0.000	4.879	6.935	0.000	6.935	9.545	11.714	12.848	7.929	Continuing	Continuing
676031: *Dismount Radar*	-	0.000	103.025	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	103.025

*This project's R-2a exhibit has been suppressed due to funding not beginning until after FY 2020

Note

In FY21 funds/activities for Agile ISR, Next-Generation Sensors and Sensors Open System Architecture will be in their own BPAC in order to provide greater visibility and transparency into these activities. These transferred efforts (SOSA, Next-Generation Sensors and Agile ISR) will not be new starts.

A. Mission Description and Budget Item Justification

The purpose of Airborne Reconnaissance System (ARS) Program is to develop, mature, demonstrate, and rapidly transition next-generation, persistent, wide area surveillance and common imagery reconnaissance sensor capabilities (active and passive systems), including sensor data processing, for multiple airborne platforms, as well as sensor products to aid in rapid targeting (geolocation models, sensor based exploitation tools, sensor networking capabilities). It provides for modeling/ simulation, training and systems engineering. This program also coordinates the development of common collection, processing, and dissemination solutions for near real time Intelligence, Surveillance, and Reconnaissance (ISR). Airborne Sensors for ISR (ASI) efforts are set by the Geospatial Intelligence (GEOINT) Capabilities Working Group (GCWG), for the goal of building a comprehensive GEOINT capability for the USAF. On an annual basis, developmental technologies are reviewed against warfighter capabilities within the Challenging Targets Initial Capabilities Document and requirements based on strategic roadmaps and ASI efforts. Efforts advancing the technological maturity of promising sensors and processing capabilities are reviewed and prioritized into a recommended list for senior executive direction to implement in the coming year. ASARS 2B efforts include, but are not limited to, development, design, fabrication, integration, demonstration, test and transition of high altitude, deep look ISR radar.

Activities also include studies and analysis to support both current program planning and execution and future program planning.
This activity also funds Sensors Open Systems Architecture (SOSA), which coordinates the development of advanced technologies open architecture development for sensor modalities such as RADAR, SIGINT, EW, communications and EO/IR in support of multiple airborne reconnaissance platforms, both manned and unmanned.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305206F / *Airborne Reconnaissance Systems*

Funding in this activity also supports Detection Removal and Characterization Operation (DRACO) and Agile ISR, to develop a robust image quality improvement capability for airborne synthetic aperture radar products supporting multiple platforms at high, medium, and low altitudes. Additionally, funding covers GCWG Secretariat to manage GCWG planning, processes, and establish an Air Force GEOINT architecture. This program element may include necessary civilian pay expenses required to manage, execute, and deliver Airborne Reconnaissance Systems capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	4.450	175.334	184.401	0.000	184.401
Current President's Budget	19.450	195.334	122.909	0.000	122.909
Total Adjustments	15.000	20.000	-61.492	0.000	-61.492
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	15.000	20.000			
• 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	-61.492	0.000	-61.492

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2018	FY 2019
Project: 674818: *Imaging and Targeting Support*		
Congressional Add: *Sensor Open System Architecture (SOSA)*	-	10.000
Congressional Add Subtotals for Project: 674818	-	10.000
Project: 675291: *Gorgon Stare*		
Congressional Add: *Gorgon Stare*	15.000	10.000
Congressional Add Subtotals for Project: 675291	15.000	10.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305206F / *Airborne Reconnaissance Systems*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2018	FY 2019
Congressional Add Totals for all Projects	15.000	20.000

Change Summary Explanation

In FY 2018, Gorgon Stare BPAC received a $15.0M Congressional add for Wide-Area Motion Imagery.
In FY 2019, Gorgon Stare BPAC received a $10.0M Congressional add for Wide-Area Motion Imagery.
In FY 2019, BPAC 674818 received a $10M Congressional add for Sensor Open Systems Architecture.
In FY 2020, BPAC 676031, decrease of $95.482M, funds reallocated for higher Air Force priorities.
In FY 2020, BPAC 674820, +$33.99M added to cover increased ASARS-2B requirement.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / *Airborne Reconnaissance Systems*	Project (Number/Name) 674818 / *Imaging and Targeting Support*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
674818: *Imaging and Targeting Support*	-	1.021	30.295	29.729	0.000	29.729	51.402	51.092	51.411	31.728	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The purpose of the Imaging and Targeting Support (I&TS) / Agile ISR is to develop, mature, demonstrate, and rapidly transition next-generation, persistent, wide area surveillance and common imagery reconnaissance sensor capabilities (active and passive systems), including sensor data processing, for multiple airborne platforms, as well as sensor products to aid in rapid targeting (geolocation models, sensor-based exploitation tools, sensor networking capabilities).

Developmental efforts pursued include but are not limited to: Radar, Electro-Optical/Infrared, hyperspectral imagery (HSI), Lidar/Ladar, and other technologies to improve measurement and signature intelligence, polarimetric imaging, ground moving target indicator (GMTI), maritime search/track, foliage penetration, nuclear event detection, and other modalities; increased geolocation accuracy; increased dismount detection capability; advanced sensor data correlation; automated target detection; network centric warfare; and other ISR and associated planning and direction; collection; processing and exploitation; analysis and production; and dissemination capabilities. These efforts are intended to reduce both target search and kill chain timelines as well as supporting traditional intelligence activities. This project will also increase interoperability by developing common standards and interfaces.

The funds in this project are distributed in priority order, as supported by the Challenging Targets Initial Capabilities Document and set by the GCWG, for the goal of building a comprehensive GEOINT capability for the USAF. On an annual basis, developmental technologies are reviewed against warfighter capabilities and requirements based on strategic roadmaps and the results of the ASI AoA as prefaced in the Challenging Targets Initial Capabilities Document. Efforts advancing the technological maturity of promising sensors and processing capabilities are reviewed and prioritized into a recommended list for senior executive direction to implement in the coming year. ASARS-2B efforts include but are not limited to development, design, fabrication, integration, demonstration, test, and transition of high altitude, deep look ISR radar.

Inclusive in I&TS is the Distributed Common Ground/Surface Systems Automated Target Recognition (ATR) effort to further mature a robust capability to detect all classes of targets through camouflage.

The purpose of DRACO is to create a robust Image Quality improvement capability for Airborne Synthetic Aperture Radar (SAR) products. All other details are classified. The software resided in multiple locations on the ground supporting the Air Force, Army, Navy and other customers DRACO efforts include but are not limited to development, design, fabrication, integration, demonstration, test and transition of image quality improvement capabilities and airborne SAR Sensors.

The Sensor Open System Architecture (SOSA) program coordinates the development of advanced technologies open architecture development for the following modalities of sensors, such as RADAR, SIGINT, EW, Communications and EO/IR (development of standards and open architecture interfaces for Software, Hardware, and Electrical/Mechanical interfaces in support of multiple airborne reconnaissance platforms, both manned and unmanned. Its objectives are to develop, demonstrate,

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
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and rapidly upgrade/iterate advanced interoperable, multi-platform solutions to reduce the find, fix, target, and track kill chain timeline, and to provide safe separation and collision avoidance for remotely piloted aircraft through development of abstraction interfaces for sense (RADAR, ADS-B, TCAS, etc….) and avoid logic. The program also coordinates the development of common collection, processing, and dissemination solutions for near real time intelligence, surveillance, and reconnaissance. The SOSA program also increases interoperability by developing common standards and interfaces, as well as leveraging industry participation towards creating COTS solutions such as common C4ISR processor, AgilePOD interfaces, Red/Black separation on the sensor, data at rest, and security/anti-tamper (AT) with industry partners and other DOD services

The project is designed to support development of next generation of sensors driven by Airborne Sensors for ISR (ASI) Analysis of alternatives (AoA), as prefaced in the Challenging Targets Initial Capabilities Document(Next Generation Sensors), as well as AFLCMC/WI/WN/WW program of record needs. As part of the development effort SOSA will be funding and supporting first article development of key open architecture solutions to validate/verify open specifications as well as to prime the COTS vendors development strategies. SOSA will also stand up AFLCMC SIL for Sensors Open System Architectures to establish a strong conformance/compliance program with industry partners for COTS products in partnership with other DOD Services.

Activities also include studies and analysis to support both current program planning and execution and future program planning. This program element may include necessary civilian pay expenses required to manage, execute, and deliver technology and sensor capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Agile ISR	1.021	6.372	6.404	-	6.404
Description: Mold current and future ISR into a platform agnostic, non-proprietary, autonomous Multi-INT fusion and cross cuing solution that is designed based on mission requirements. Sensors will have to penetrate up to highly contested domains and survive to operate. This project will also increase interoperability by developing common standards and interfaces for mission and sensor systems. Through the AoA execution, the solution set will improve requirements and the development path for High Altitude SAR (ASARS), Next Generation Sensors, DRACO, SOSA, as well as other GCWG approved projects. ***FY 2019 Plans:*** - Continue Section 804 efforts and execute various ATD efforts including, but not limited to Triple Raven which supports Tech Maturation and Risk Reduction (TMRR), and M&S to mold current and future ISR into a platform agnostic, non-proprietary, autonomous Multi-INT fusion and cross cuing solution that is designed based on mission requirements. This includes but not limited to Next Generation Sensors, Detection Removal and Characterization Operation (DRACO), Sensor Open System Architecture (SOSA), and other GCWG approved projects.					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
- Increase interoperability by developing common standards and interfaces. - Will continue support development of AgilePOD internal electrical/mechanical interfaces. - Utilize ASI AoA and its prioritized list of current and future sensor combinations multiple CDD development will begin. - Continue further work with other Services in producing SOSA V 1.0 snapshots based on current set of USAF needs. - Will continue fielding deliveries for DRACO capabilities to the National Air and Space Intelligence Center (NASIC and within the Distributed Common Ground System (DCGS) weapon System. ***FY 2020 Base Plans:*** - Will continue Section 804 efforts and execute various ATD efforts including, but not limited to Triple Raven which supports Tech Maturation and Risk Reduction (TMRR), and M&S to mold current and future ISR into a platform agnostic, non-proprietary, autonomous Multi-INT fusion and cross cuing solution that is designed based on mission requirements. This includes but not limited to Next Generation Sensors, Detection Removal and Characterization Operation (DRACO), Sensor Open System Architecture (SOSA), and other GCWG approved projects. - Will increase interoperability by developing common standards and interfaces. - Will continue support of C-ABSAA Technology Maturation and risk reduction phase - Will continue first article development of SOSA, SAR/SIGINT prototype - Will continue support development of AgilePOD internal electrical/mechanical interfaces - Will continue further work with other Services in producing SOSA V 1.0 snapshots based on current set of USAF needs. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY20 increased to match estimated costs.					
Title: ASARS-2B ***Description:*** Develop/design/fabricate/integrate/demonstrate/test and field deep look high altitude ISR radar capabilities. ***FY 2019 Plans:*** - Continue to develop/design/fabricate/integrate/demonstrate/test and field deep look high altitude ISR radar capabilities. ***FY 2020 Base Plans:***	0.000	13.923	23.325	-	23.325

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305206F / *Airborne Reconnaissance Systems*	**Project (Number/Name)** 674818 / *Imaging and Targeting Support*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
- Will continue to develop/design/fabricate/integrate/demonstrate/test and field deep look high altitude ISR radar capabilities. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding increased to match estimated costs for ASARS-2B operationalization					
Accomplishments/Planned Programs Subtotals	1.021	20.295	29.729	-	29.729

	FY 2018	FY 2019
Congressional Add: Sensor Open System Architecture (SOSA)	-	10.000
FY 2019 Plans: - Continue work with other Services in producing SOSA snapshots based on current set of USAF needs.		
Congressional Adds Subtotals	-	10.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• RDTE 07 0305202F: *Dragon U-2*	34.486	48.518	38.939	-	38.939	18.694	18.347	19.849	20.206	Continuing	Continuing
• APAF 06 0305206F: *Airborne Reconnaissance Systems*	-	-	66.443	-	66.443	48.204	72.340	28.108	15.880	0.000	230.975

Remarks

A portion of the funding within the U-2 RDT&E line will be used to advance ASARS development / design/fabrication/integration/demonstration/testing and fielding deep look high altitude ISR radar capabilities.

D. Acquisition Strategy

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

ASARS / High Altitude SAR technology maturation is conducted by Air Force Life Cycle Management Center/Intelligence, Surveillance, and Reconnaissance and Special Operations Forces (AFLCMC/WIN), in conjunction and cooperation with AFLCMC/HBG (Robins AFB) for test support.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305206F / *Airborne Reconnaissance Systems*	**Project (Number/Name)** 674818 / *Imaging and Targeting Support*

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

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / *Airborne Reconnaissance Systems*	Project (Number/Name) 674818 / *Imaging and Targeting Support*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SOSA	Various	Various : TBD	-	-		13.523	Feb 2019	2.683	Feb 2020	-		2.683	Continuing	Continuing	-
DRACO	SS/CPFF	Lockheed Martin : King of Prussisa, PA	-	-		2.849	Nov 2018	3.721	Mar 2020	-		3.721	Continuing	Continuing	-
ASARS-2B operationalization	SS/CPIF	Raytheon : El Segundo, CA	-	-		11.124	Feb 2019	17.256	Dec 2019	-		17.256	Continuing	Continuing	170.430
		Subtotal	-	-		27.496		23.660		-		23.660	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NGS PMA: Other Govt Cost	SS/T&M	Various : Dayton, OH	-	1.021		2.799	Nov 2018	6.069	Nov 2019	-		6.069	Continuing	Continuing	-
		Subtotal	-	1.021		2.799		6.069		-		6.069	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	1.021		30.295		29.729		-		29.729	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305206F / *Airborne Reconnaissance Systems*	**Project (Number/Name)** 674818 / *Imaging and Targeting Support*

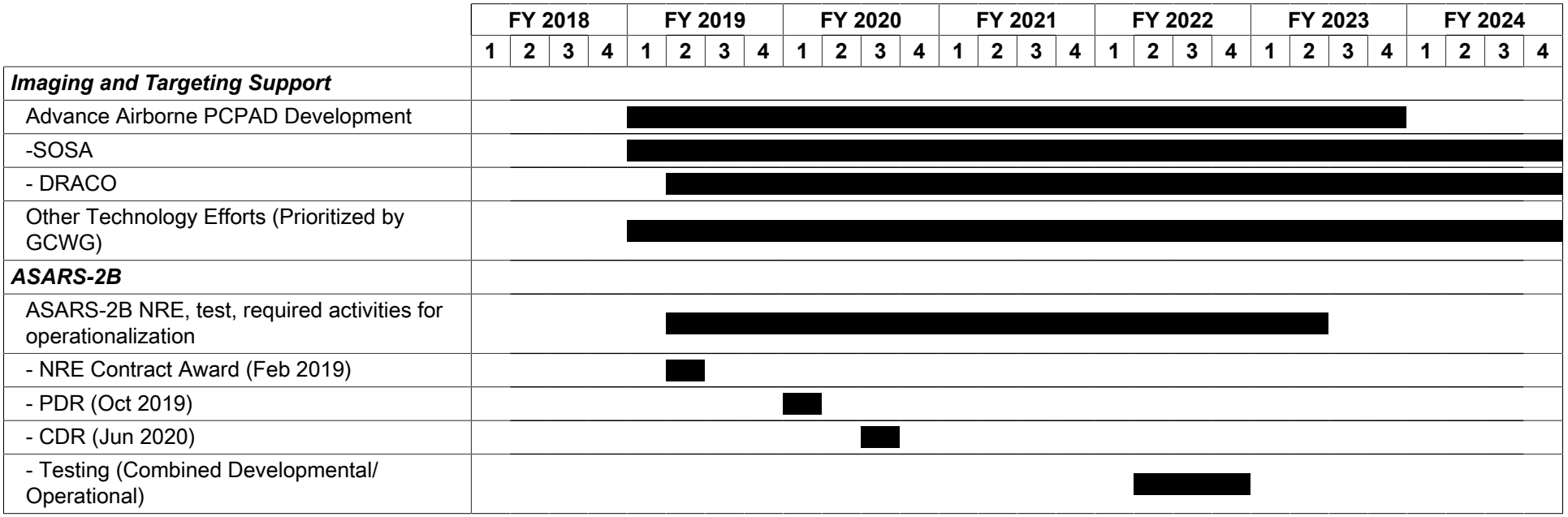

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305206F / *Airborne Reconnaissance Systems*	**Project (Number/Name)** 674818 / *Imaging and Targeting Support*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Imaging and Targeting Support				
Advance Airborne PCPAD Development	1	2019	4	2023
-SOSA	1	2019	4	2024
- DRACO	2	2019	4	2024
Other Technology Efforts (Prioritized by GCWG)	1	2019	4	2024
ASARS-2B				
ASARS-2B NRE, test, required activities for operationalization	2	2019	2	2023
- NRE Contract Award (Feb 2019)	2	2019	2	2019
- PDR (Oct 2019)	1	2020	1	2020
- CDR (Jun 2020)	3	2020	3	2020
- Testing (Combined Developmental/Operational)	2	2022	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / *Airborne Reconnaissance Systems*	Project (Number/Name) 674820 / *Sensor Development*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
674820: *Sensor Development*	-	0.000	43.681	82.724	0.000	82.724	9.191	0.000	0.000	0.000	0.000	135.596
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Additional funds for ASARS-2B efforts reside in Project 674818.

A. Mission Description and Budget Item Justification

The purpose of this effort is to complete ASARS-2B Technical Demonstration and continue ASARS design, development, testing and fielding of deep look high altitude ISR radar capabilities based on requirements in the U-2 Operational Requirements Document and approved AF Form 1067s.

Activities also include studies and analysis to support both current program planning and execution as well as future program planning.
This program element may include necessary civilian pay expenses required to manage, execute, and deliver Airborne Reconnaissance Systems capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Advanced Synthetic Aperture Radar System (ASARS)-2B	0.000	43.681	82.724	-	82.724
Description: Develop/design/fabricate/integrate/demonstrate/test and field deep look high altitude ISR radar capabilities. ***FY 2019 Plans:*** - Continue to develop/design/fabricate/integrate/demonstrate/test and field deep look high altitude ISR radar capabilities. ***FY 2020 Base Plans:*** - Will continue to Develop/design/fabricate/integrate/demonstrate/test and field deep look high altitude ISR radar capabilities. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding increased to match estimated costs for ASARS-2B operationalization					
Accomplishments/Planned Programs Subtotals	0.000	43.681	82.724	-	82.724

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305206F / *Airborne Reconnaissance Systems*	**Project (Number/Name)** 674820 / *Sensor Development*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• RDTE 07 0305202F: *Dragon U-2 (JMIP)*	34.486	48.518	38.939	-	38.939	18.694	18.347	19.849	20.206	Continuing	Continuing
• APAF 06 0305206F: *Airborne Reconnaissance Systems*	-	-	66.443	-	66.443	48.204	72.340	28.108	15.880	0.000	230.975

Remarks

A portion of the funding within the U-2 RDT&E line will be used to advance ASARS development / design/fabrication/integration/demonstration/testing and fielding deep look high altitude ISR radar capabilities.

D. Acquisition Strategy

ASARS / High Altitude SAR technology maturation is conducted by Air Force Life Cycle Management Center/Intelligence, Surveillance, and Reconnaissance and Special Operations Forces (AFLCMC/WIN), in conjunction and cooperation with AFLCMC/HBG (Robins AFB) for test support.
Acquisition strategy is to maximize commercial and national development efforts and investment through multiple contracting methods, including the use of engineering change proposals to modify existing contracts and new contracts that were awarded both competitively or on a sole source basis.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / *Airborne Reconnaissance Systems*	Project (Number/Name) 674820 / *Sensor Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ASARS-2B operationalization	SS/CPIF	Raytheon : El Segundo, CA	-	-		43.681	Feb 2019	82.724	Dec 2019	-		82.724	Continuing	Continuing	-
		Subtotal	-	-		43.681		82.724		-		82.724	Continuing	Continuing	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		43.681		82.724		-		82.724	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305206F / *Airborne Reconnaissance Systems*	**Project (Number/Name)** 674820 / *Sensor Development*

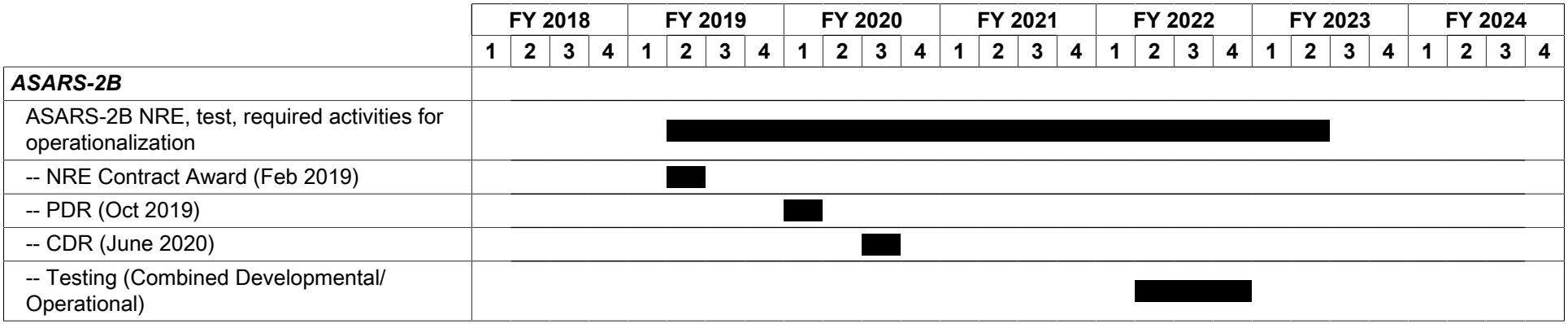

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305206F / *Airborne Reconnaissance Systems*	**Project (Number/Name)** 674820 / *Sensor Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ASARS-2B				
ASARS-2B NRE, test, required activities for operationalization	2	2019	2	2023
-- NRE Contract Award (Feb 2019)	2	2019	2	2019
-- PDR (Oct 2019)	1	2020	1	2020
-- CDR (June 2020)	3	2020	3	2020
-- Testing (Combined Developmental/Operational)	2	2022	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / *Airborne Reconnaissance Systems*	Project (Number/Name) 675092 / *JTC/SIL MUSE*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675092: *JTC/SIL MUSE*	-	3.429	3.454	3.521	0.000	3.521	3.580	3.653	3.720	3.786	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Multiple Unified Simulation Environment (MUSE) is the DoD simulation/training system of choice for many Unmanned Aircraft Systems (UAS), RPA, and ISR systems. MUSE is also know as the Air Force Synthetic Environment for Reconnaissance and Surveillance (AFSERS) in its Air Force Application. The MUSE/AFSERS is a software suite that simulates ISE & strike systems, tailored air vehicle & data links, and visualization systems used for payload product outputs-including Full Motion Video (FMV), Still Frame Imagery, or GMTO data. Air vehicles, sensors, datalinks, takeoff and landing systems, and to some degree, surrogate UAS and RPA ground stations, when actual ground stations are unavailable. FMV, still frame imagery, or GMTI data are provided. Outputs are compliant with applicable DoD standards and are continually tested against actual ground ISR processors to ensure interoperability with over 40 systems within DoD.

The Services and combatant commanders have a requirement for the capability to train with a system that provides a real-time simulation environment containing multiple intelligence systems that can be integrated with larger force-on-force simulations. The MUSE/AFSERS creates a realistic operational environment which supports the ability to assess military utility, architecture and concept of employment development, and Tactics, Techniques, and Procedures refinement, conduct emerging concepts experimentation, and optimize C4ISR within warfighting exercises and experiments. It is the preferred simulation system used by the combatant commanders and Joint Services to support command and battle staff C4ISR training.

The MUSE/AFSERS also creates a realistic operational environment that supports: an embedded training capability for multiple Program Managers; tools to minimize acquisition and life cycle cost and schedule impacts; ability to conduct emerging concepts experimentation, future systems exploration, systems integration, and technology insertion; applications for Joint and Service-specific warfighting exercises; and C4ISR optimization.

MUSE/AFSERS is currently in use within all Services and most unified commands simulating MQ-1, MQ-9, RQ-4, MQ-1C, M/RQ-5, RQ-7, national and commercial satellite collectors, P-3, E-8, and the U-2. During warfighting exercises, the AFSERS provides imagery simulations with associated C4ISR systems to support the execution of critical imagery processes. The MUSE/AFSERS is also used as a mission rehearsal tool for current, on-going military combat operations.

The Joint Technology Center/Systems Integration Laboratory (JTC/SIL) is the center of excellence that supports the UAS and RPA programs within the services by providing the system engineering, test and integration, interoperability, rapid technology insertion and training to address MUSE/AFSERS requirements. For those assets normally not available for training, the JTC/SIL provides surrogate systems and interfaces. The JTC/SIL contributes to the distributed training environments, virtually linking participants from various locations worldwide, and are routinely supported within the MUSE architecture.

Activities also include studies and analysis supporting current and future program planning and project execution. This program element may include necessary civilian pay expenses required to manage, execute, and deliver Airborne Reconnaissance Systems capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305206F / *Airborne Reconnaissance Systems*	**Project (Number/Name)** 675092 / *JTC/SIL MUSE*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Air Force Synthetic Environment for Reconnaissance and Surveillance (AFSERS) Development	3.429	3.454	3.521	-	3.521
Description: DoD's simulation/training system of choice for Intelligence Surveillance and Reconnaissance systems, sensors, and platforms. Includes AFSERS, Common Ground Station Interface, and infrastructure support. ***FY 2019 Plans:*** - Continue integration of NVIG into the Modeling & Simulation domain as it pertains to unmanned aircraft systems simulation. Terrain, and model development for NVIG and Virtual Reality Scene Generator to increase fidelity. - Continue support of theater level exercises: Ulchi Freedom Guardian, Key Resolve and Pacific Sentry-mods from exercises. - Continue to support improvement of mapping capability that facilitates 64 Bit, RMF accredited execution. - Continue redesign Windows Entity Server and NetLink to improve network routing, thus lessening bandwidth consumption. - Continue incorporate Common Image Generator Interface to provide an Image Generator (IG) agnostic solution to allow other IGs to be supported. - Continue to implement tactical protocols into the simulation domain to enhance interoperability. - Continue to refine the implementation of Hands on Throttle and Stick joystick. - Continue to analyze the redesign of VIPRS editor to fit current architecture. - Continue to address DoD standards and compliance to keep current with real world systems. - Continue to address ongoing modifications, test and integration for use in federation environment - Continue to address ongoing requirements from AFSERS User Working group based on available funding and time frame. ***FY 2020 Base Plans:*** - Will continue integration of Moving Target Indicator/Synthetic Aperture Radar payload models and the Vehicle and Dismount Exploitation Radar into MUSE - Will continue development/integration of multi-sensor payload simulations to support training missions - Will continue development of realistic simulated aircraft & payload behavior in a jamming/electronic warfare environment - Will continue integration of Night Vision Image Generator and Virtual Reality Scene Generator into the Modeling & Simulation domain as it pertains to UAS simulation, terrain and model development					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305206F / *Airborne Reconnaissance Systems*	**Project (Number/Name)** 675092 / *JTC/SIL MUSE*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
- Will continue to support theater level exercises and events to include but not limited to Ulchi Freedom Guardian, Yama Sakura, Key Resolve, Talisman Saber, Pacific Sentry, integration/validation events, and government acceptance tests - Will continue redesign of Connect and Netlink routing software to improve network routing and large data feeds - Will continue work on Vignette Planning & Rehearsal Software to include improved user interface, Semi-Automated Forces capability, and vignette building tools - Will continue work on architecture optimization, to facilitate extensibility and scalability. - Will continue movement towards standards based Unmanned Aerial System (UAS) simulation support - Will continue integration and improvement of Link 16 capabilities - Will continue to address ongoing requirements from AFSERS User Working group based on available funding and time frame ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Small inflation related increase					
Accomplishments/Planned Programs Subtotals	3.429	3.454	3.521	-	3.521

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• RDTE 07 PE 0305204A: *Tactical Unmanned Aerial Vehicles*	4.712	4.748	4.954	-	4.954	4.833	4.327	4.244	4.099	Continuing	Continuing

Remarks

D. Acquisition Strategy

This is an enterprise services effort, jointly funded and centrally managed by the US Army. AFLCMC/WIN MIPRs funds in support of Unmanned Aircraft Systems modeling and simulation efforts.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / *Airborne Reconnaissance Systems*	Project (Number/Name) 675092 / *JTC/SIL MUSE*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AFSERS Development	MIPR	Redstone Arsenal : Huntsville, AL	-	3.429	Jan 2018	3.454	Feb 2019	3.521	Dec 2019	-		3.521	Continuing	Continuing	-
		Subtotal	-	3.429		3.454		3.521		-		3.521	Continuing	Continuing	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	3.429		3.454		3.521		-		3.521	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305206F / *Airborne Reconnaissance Systems*	**Project (Number/Name)** 675092 / *JTC/SIL MUSE*

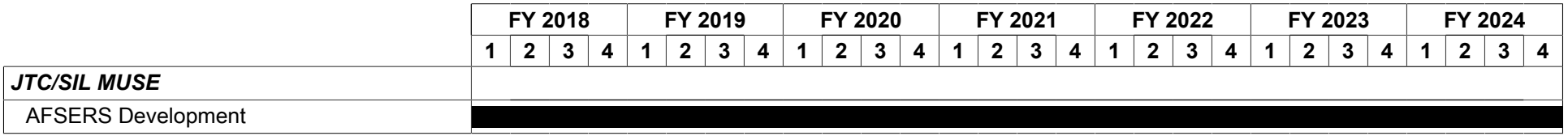

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305206F / *Airborne Reconnaissance Systems*	**Project (Number/Name)** 675092 / *JTC/SIL MUSE*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
JTC/SIL MUSE				
AFSERS Development	1	2018	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / *Airborne Reconnaissance Systems*	Project (Number/Name) 675291 / *Gorgon Stare*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675291: *Gorgon Stare*	-	15.000	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Gorgon Stare system is a podded airborne sensor suite that provides city-sized wide area airborne surveillance and is integrated on specially-modified MQ-9 Reaper Remotely Piloted Aircraft (RPA). The Air Force Requirements Oversight Council (AFROC) approved Air Combat Command's recommendation to transition Gorgon Stare from a Quick Reaction Capability (QRC) to an Air Force Enduring Capability in November 2014. Gorgon Stare's requirements are documented in the Gorgon Stare Wide Area Airborne Sensor Capabilities Development Document (draft). The acquisition strategy for this Air Force podded sensor suite solution is sustainment of the currently fielded capabilities with any upgrades implemented via validated -1067s or Urgent Operational Needs.

Development efforts conducted with FY 2015 Congressionally added funds included efforts focused primarily on the development of a Beyond Line of Sight (BLOS) capability in support of an Urgent Operational Need. Development efforts conducted with FY 2016 Congressionally added RDT&E funds included further development and system integration lab testing of Near Vertical Direction Finding (NVDF) with Gorgon Stare Increment 2 Wide Area Motion Imagery (WAMI) sensors. Funds spent on NVDF will provide a ramp for future airborne integration efforts as required. Development efforts conducted with FY 2017 Congressionally added funds further progressed efforts associated with BLOS, to include first article testing for phase 1 and a limited BLOS capability expected to deliver to the field in FY 2019. Development efforts conducted with FY 2018 Congressionally added funds include but are not limited to efforts to further develop the design and implementation of the next BLOS phase to enable freedom of maneuverability and initial development of system imagery improvements in support of a MAJCOM validated -1067. Development efforts conducted with FY 2019 Congressional added funds include but are not limited to; completing BLOS Phase II system design and aircraft certification to enable full freedom of maneuverability; completing imagery improvements in support of a MAJCOM validated -1067 and continuation of data automation through Area of Interest (AOI) tagging and tracking efforts.

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

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Gorgon Stare capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F and 0605833F.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019
Congressional Add: Gorgon Stare	15.000	10.000
FY 2018 Accomplishments: - Completed fielding of a limited BLOS capability. - Began initial development of system imagery improvements in support of a MAJCOM validated -1067.		

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305206F / *Airborne Reconnaissance Systems*	**Project (Number/Name)** 675291 / *Gorgon Stare*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019
- Began initial development of the next phase of BLOS capability.		
FY 2019 Plans: - Completes development of a BLOS Phase II capability. - Completes system imagery improvements in support of a MAJCOM validated -1067. - Ensures continuation of data automation through Area of Interest (AOI) tagging and tracking efforts.		
Congressional Adds Subtotals	15.000	10.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APAF 05 PRDTB3: *MQ-9 UAS Payloads*	0.000	16.000	0.000	19.800	19.800	0.000	0.000	0.000	0.000	0.000	35.800
• APAF 06 DARP01: *Airborne Reconnaissance Systems*	0.000	7.500	0.000	1.500	1.500	0.000	0.000	0.000	0.000	0.000	9.000

Remarks

D. Acquisition Strategy

The wide area airborne surveillance requirement is being delivered via the Gorgon Stare podded WAMI sensor suite integrated on dedicated, specially modified MQ-9 Reaper RPA. Gorgon Stare transitioned from a QRC to an Air Force Enduring Capability under AFROC authority in November 2014. The program is executed by the 645th Aeronautical Systems Group, Intelligence, Surveillance, and Reconnaissance and Special Operations Forces Directorate as a post-MS C program. The sensor suite will be sustained in its current configuration. Any future capability upgrades will be fielded as a result of validated -1067s or Urgent Operational Needs.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / *Airborne Reconnaissance Systems*	Project (Number/Name) 675291 / *Gorgon Stare*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Gorgon Stare System Development	SS/CPFF	Sierra Nevada Corporation : Sparks, NV	-	15.000	May 2018	10.000	Jan 2019	-		-		-	Continuing	Continuing	25.000
		Subtotal	-	15.000		10.000		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	15.000		10.000		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305206F / *Airborne Reconnaissance Systems*	**Project (Number/Name)** 675291 / *Gorgon Stare*

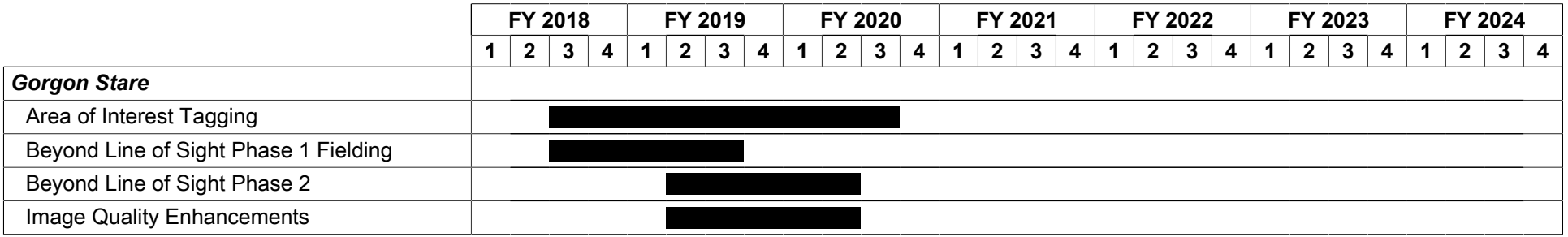

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305206F / *Airborne Reconnaissance Systems*	**Project (Number/Name)** 675291 / *Gorgon Stare*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Gorgon Stare				
Area of Interest Tagging	3	2018	3	2020
Beyond Line of Sight Phase 1 Fielding	3	2018	3	2019
Beyond Line of Sight Phase 2	2	2019	2	2020
Image Quality Enhancements	2	2019	2	2020

Note

Gorgon Stare will continue operations as required using sustainment funding.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / *Airborne Reconnaissance Systems*	Project (Number/Name) 676025 / *Data Compression*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
676025: *Data Compression*	-	0.000	4.879	6.935	0.000	6.935	9.545	11.714	12.848	7.929	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

RDUCE provides the warfighter a capability to efficiently compress and decompress airborne Intelligence, Surveillance, and Reconnaissance ISR sensor data and transmit near real time to tactical users through current and future bandwidth limited commercial satellite communications (SATCOM) or military SATCOM. The effort is developing, testing and will implement new sensor data compression and decompression algorithms for current and emerging airborne ISR sensors. Additionally, the program develops compression and decompression capabilities for manned and unmanned airborne platforms, associated ground stations, and Distributed Common Ground System (DCGS). Outputs will meet standard certification for use within the Department of Defense and Intelligence Community (IC) Geospatial Intelligence (GEOINT) and Measurement and Signatures Intelligence architectures.

Activities also include studies and analysis to support both current and future program planning and execution. This program element may include necessary civilian pay expenses required to manage, execute, and deliver Data Compression sensor capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Data Compression	0.000	4.879	6.935	-	6.935
Description: The Data Compression effort provides the warfighter a capability to efficiently compress and decompress airborne Intelligence, Surveillance and Reconnaissance (ISR) sensor data and transmit near real time to tactical users through current and future bandwidth limited commercial Satellite Communications (SATCOM) or military SATCOM. The effort will develop, test and implement new sensor data compression and decompression algorithms for current and emerging airborne ISR sensors. Additionally, the program develops compression and decompression capabilities for manned and unmanned airborne platforms, associated ground stations, and the Distributed Common Ground System (DCGS). Outputs will meet standard certification for use within the Department of Defense Geospatial Intelligence and Measurement and Signatures Intelligence architectures.					
FY 2019 Plans: - Continue to develop and test our existing data compression capabilities including SAR, Phase History SAR and HSI/MSI.					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305206F / *Airborne Reconnaissance Systems*	**Project (Number/Name)** 676025 / *Data Compression*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
- Develop compression capabilities for other phenomenologies, including, but not limited to, SIGINT, LIDAR, and EO/IR. - Support integration of compression capabilities into operational sensors including, but not limited to, the U2/ ASARS, Global Hawk MP-RTIP/EISS, and Reaper/LynxSAR. - Continue to develop and test compression and decompression algorithms for other sensor modalities. - Continue to develop documentation for DoD and international standards acceptance of our compression capabilities. - Continue to provide engineering services for algorithm familiarization, assessment, and improvement. - Continue to participate in SOSA (and other open standards) planning and integration. ***FY 2020 Base Plans:*** - Will continue to develop and test our existing data compression capabilities including SAR, Phase History SAR and HSI/MSI. - Will continue to develop compression capabilities for other phenomenologies, including, but not limited to, SIGINT, LIDAR, and EO/IR. - Will continue to support integration of compression capabilities into operational sensors including, but not limited to, the U2/ASARS, Global Hawk MP-RTIP/EISS, and Reaper/LynxSAR. - Will continue to develop and test compression and decompression algorithms for other sensor modalities. - Will continue to develop documentation for DoD and international standards acceptance of our compression capabilities. - Will continue to provide engineering services for algorithm familiarization, assessment, and improvement. - Will continue to participate in SOSA (and other open standards) planning and integration. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY20 increased funding supports additional ISR modalities moving to sustainment (e.g. SAR Phase History), as well as development on other modalities such as SIGINT, EO/IR, and LIDAR.					
Accomplishments/Planned Programs Subtotals	0.000	4.879	6.935	-	6.935

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305206F / *Airborne Reconnaissance Systems*	**Project (Number/Name)** 676025 / *Data Compression*

D. Acquisition Strategy

Date Compression program is conducted by Air Force Life Cycle Management Center/ Intelligence, Surveillance, and Reconnaissance and Special Operations Forces (AFLCMC/WIN). Acquisition strategy is to develop data compression hardware/software, and data compression standards for various Intelligence, Surveillance, and Reconnaissance platforms to include airborne, ground stations, data storage facilities, and exploitation tools. RDUCE will utilize existing contracts with full and open competition where appropriate. Integration will be accomplished by the requisite program offices.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / *Airborne Reconnaissance Systems*	Project (Number/Name) 676025 / *Data Compression*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
LIDAR	Various	Not specified. : TBD	-	-		1.800	Mar 2019	1.200	Nov 2019	0.000		1.200	Continuing	Continuing	-
SIGzip Phase II	TBD	Not specified. : TBD	-	-		-		1.033	Feb 2020	-		1.033	Continuing	Continuing	-
New Mode Phase I	TBD	Not specified. : TBD	-	-		-		2.000	Feb 2020	-		2.000	Continuing	Continuing	-
		Subtotal	-	-		1.800		4.233		0.000		4.233	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Standardization Development	C/CPAF	Not specified. : TBD	-	-		1.427	Feb 2019	1.000	Nov 2019	-		1.000	Continuing	Continuing	-
		Subtotal	-	-		1.427		1.000		-		1.000	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ADDA Lab	C/CPAF	Not specified. : TBD	-	-		0.500	Jan 2019	0.500	Oct 2019	-		0.500	Continuing	Continuing	-
COMPASE Lab	TBD	Not specified. : TBD	-	-		0.300	Jan 2019	0.300	Dec 2019	-		0.300	Continuing	Continuing	-
		Subtotal	-	-		0.800		0.800		-		0.800	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMA: Other Govt. Cost	Various	Govt/Cont: Dayton, OH : Various, OH	-	-		0.852	May 2019	0.902	May 2020	-		0.902	Continuing	Continuing	-
		Subtotal	-	-		0.852		0.902		-		0.902	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / *Airborne Reconnaissance Systems*	Project (Number/Name) 676025 / *Data Compression*	

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		4.879		6.935		0.000		6.935	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305206F / *Airborne Reconnaissance Systems*	**Project (Number/Name)** 676025 / *Data Compression*

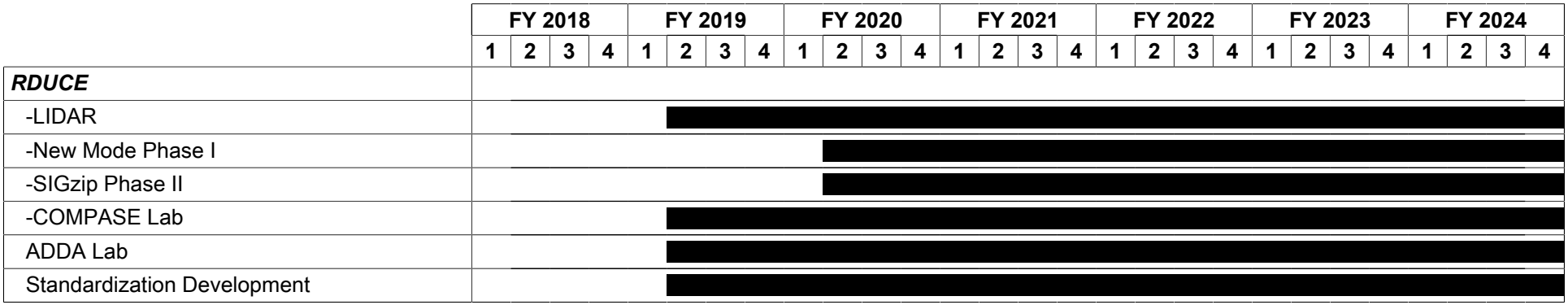

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305206F / *Airborne Reconnaissance Systems*	**Project (Number/Name)** 676025 / *Data Compression*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
RDUCE				
-LIDAR	2	2019	4	2024
-New Mode Phase I	2	2020	4	2024
-SIGzip Phase II	2	2020	4	2024
-COMPASE Lab	2	2019	4	2024
ADDA Lab	2	2019	4	2024
Standardization Development	2	2019	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / *Airborne Reconnaissance Systems*	Project (Number/Name) 676031 / *Dismount Radar*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
676031: *Dismount Radar*	-	0.000	103.025	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	103.025
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Dismount Radar (DR) project designs, develops, integrates, tests, fields, and sustains Moving Target Indicator (MTI) capability for improved dismount and moving target detection, identification, tracking, and classification. This sensor will be employed on airborne platforms, such as the MQ-9 Reaper. These efforts will accelerate development of technologies and concept of operations (CONOPS) for Advance Battle Management System (ABMS) battle management command, and ground missions across the range of contested environments.

Activities also include studies, analysis, and technology development, maturation, and demonstration to support current and future program planning and execution. This program element may include necessary civilian pay expenses required to manage, execute, and deliver Airborne Reconnaissance Systems capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: DR ***Description:*** Design, develop, integrate, test, field, and sustain a persistent capability in theater for employment on airborne platforms and various technical studies/analysis to support future advanced radar development. ***FY 2019 Plans:*** Award contract to begin design, development, integration, and testing of MTI capability on medium altitude airborne platforms. ***FY 2020 Base Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funds decreased to zero.	0.000	103.025	0.000	-	0.000
Accomplishments/Planned Programs Subtotals	0.000	103.025	0.000	-	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305206F / *Airborne Reconnaissance Systems*	**Project (Number/Name)** 676031 / *Dismount Radar*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / *Airborne Reconnaissance Systems*	Project (Number/Name) 676031 / *Dismount Radar*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DR Development	TBD	TBD : TBD	-	-		102.000	Aug 2019	-		-		-	Continuing	Continuing	-
		Subtotal	-	-		102.000		-		-		-	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMA: Other Govt Cost	Various	TBD : TBD	-	0.000	Sep 2018	1.025	Sep 2019	-		-		-	Continuing	Continuing	-
		Subtotal	-	0.000		1.025		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.000		103.025		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305206F / *Airborne Reconnaissance Systems*	**Project (Number/Name)** 676031 / *Dismount Radar*

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
DR																												
Imaging and Targeting Support- Other Technology Efforts (Prioritized by GCWG)	[redacted]																											

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305206F / *Airborne Reconnaissance Systems*	**Project (Number/Name)** 676031 / *Dismount Radar*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
DR				
Imaging and Targeting Support- Other Technology Efforts (Prioritized by GCWG)	1	2018	4	2019

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305207F / *Manned Reconnaissance Systems*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	14.297	14.223	11.787	0.000	11.787	14.738	15.044	15.319	15.595	Continuing	Continuing
674754: *RC-135 Systems*	-	14.297	14.223	11.787	0.000	11.787	14.738	15.044	15.319	15.595	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The RC-135 operational systems development and enhancement activities support the design studies, engineering analysis, non-recurring engineering, and other efforts associated with the integration and modification of the RC-135 programs and their specialized mission systems, both air and ground. Associated ground systems include RIVET JOINT Mission Trainers (RJMT, a.k.a. mission crew simulators), Ground Data Processing Systems (GDPS), Distributed Mission Shelters (DMS), Mission Crew Training Systems (MCTS), Airborne Capabilities Extension System (ACES), and the Operational Flight Trainers (OFT, a.k.a. flight deck simulators). Extensive utilization of Commercial-Off-The-Shelf (COTS) based solutions allows rapid fielding of needed capabilities through upgrades and supports Diminishing Manufacturing Sources (DMS)/Vanishing Vendor Items (VVI) logistics mitigation efforts. The results of these efforts provide for preliminary assessments of technical feasibility, operability, or military utility as well as specific engineering implementations for integration into the various systems baseline configurations.

These activities are managed by the Air Force through the 645th Aeronautical Systems Group (645 AESG). The 645 AESG (a.k.a. BIG SAFARI Systems Program Office or SPO) manages engineering, ground and support systems modifications, integration, flight testing, product assurance, acceptance testing, logistics, and training activities.

Aircraft, sensor systems, and associated ground support system engineering planned for FY 2020 budget includes developmental planning, execution and support for the RC-135V/W RIVET JOINT Baselines 12 and 13 (BL-12 and BL-13), the RC-135U COMBAT SENT Baselines 5 and 6 (BL-5 and BL-6), and the RC-135S COBRA BALL BL-5 and BL-6 configurations. The world-wide challenge of keeping pace against technologically agile targets used by both nation and non-nation-state adversaries and the rapid evolution of COTS technologies demands a responsive and adaptive acquisition strategy for fielding incremental spiral upgrades and baseline capabilities that are logistically supportable at all locations. The 645 AESG uses an incremental baseline strategy to mitigate risk, find affordable solutions and field needed capabilities on the aircraft and associated ground support and training systems. Obsolescence and DMS/VVI logistical concerns are addressed with each baseline upgrade strategy and assessed annually as part of the fleet sustainment responsibilities.

RIVET JOINT BL-12 upgrades consist of, but are not limited to, increased digital signal exploitation, increased digital signal recorder bandwidth, enhanced spatial processing/exploitation, enhanced weather radar, digitally enhanced electronic flight instrument system (EFIS), continued Communications, Navigation, Surveillance/Air Traffic Management (CNS/ATM) compliant cockpit avionics enhancements, Air Force Distributed Common Ground System (AF-DCGS) interoperability, operator work station 3-D map projection, enhanced operator reporting management tools, modernized communications security (COMSEC) protocols, and a new steerable beam antenna. RIVET JOINT BL-13 upgrades consist of, but are not limited to, providing a continuous recording capability, Super Wideband Compressive Receiver (SWCR) and Nyquist Folding Receiver (NYFR), CNS/ATM avionics upgrades such as new autopilot, automated data system-broadcast (ADS-B) and Mode 5 identify friendly or foe (IFF) systems, and family of beyond-line-of-sight terminals (FAB-T) advanced extremely high frequency (AEHF) communications suite.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305207F / *Manned Reconnaissance Systems*

COMBAT SENT BL-5 upgrades consist of, but are not limited to, active ranging and theater networked geo-location (TNG) capability, cooling duct and lighting improvements, RJ Baseline 11/12 (BL-11/12) communications intelligence (COMINT), upgraded computer architecture, wideband global satellite (WGS) communications enhanced integration, development of an airborne tracking system, communications upgrade to include Multifunctional Information Distribution System Joint Tactical Radio System (MIDS-J), and continued CNS/ATM compliant cockpit avionics enhancements. COMBAT SENT BL-6 developmental enhancements consist of, but are not limited to, steerable beams for the COMINT sub-system, improved SWCR capability and specific emitter identification (SEI) electronic intelligence (ELINT) sub-system, Primary Sensor Measurement System (PRISMS) merge with manual precision collections, millimeter wave and low band capabilities with PRISMS, digitizing antennas, direction finding of High Frequency signals and expanded streaming audio services and 360 degree aircraft tracking system. BL-6 RDT&E is funded via PE 0305206G.

COBRA BALL BL-5 upgrades consist of, but are not limited to, RJ BL-11/12 COMINT, WGS communications enhanced integration, communications upgrades to include MIDS-J and an intercom system (FORCE), and continued CNS/ATM compliant cockpit avionics enhancements. COBRA BALL BL-6 developmental enhancements consist of, but are not limited to, high gain S-Band antenna, large format Sapphire windows, RJ BL-13 COMINT capability, foreign instrumentation signals intelligence (FISINT) analog to digital receiver, and Brave version of the digital cockpit avionics systems to continue CNS/ATM compliance initiatives. BL-6 RDT&E is funded via PE 0301314F.

Ground Systems Baseline upgrades add the capabilities found in the corresponding RIVET JOINT Baseline upgrades (i.e., RIVET JOINT BL-11 corresponds to Ground System BL-11, RIVET JOINT BL-12 corresponds to Ground System BL-12, RIVET JOINT BL-13 corresponds to Ground System BL-13) to the Ground Systems to ensure crews receive training on the appropriate mission system configurations.

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

This program element may include necessary civilian pay expenses required to manage, execute, and deliver RC-135 capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305207F / *Manned Reconnaissance Systems*

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	14.269	14.223	14.487	0.000	14.487
Current President's Budget	14.297	14.223	11.787	0.000	11.787
Total Adjustments	0.028	0.000	-2.700	0.000	-2.700
• 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	0.028	0.000	-2.700	0.000	-2.700

Change Summary Explanation

There is a $2.7M FY20 reduction being used for other Air Force priorities.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Manned Reconnaissance Systems	14.297	14.223	11.787
Description: Non-recurring engineering (NRE) for Baseline system developments and enhancements to improve mission capabilities of the RIVET JOINT BL-12 and BL-13, COMBAT SENT BL-5 and BL-6, COBRA BALL BL-5 and BL-6, and Ground Systems BL-11 and BL-12			
FY 2019 Plans: • Continue Engineering Analysis • Continue NRE and other efforts associated with the integration and modification of the RC-135 primary mission equipment • Continue Specialized Mission Systems development for the collection of both air and ground signals.			
FY 2020 Plans: Will initiate contracts to: • Continue Engineering Analysis • Continue NRE and other efforts associated with the integration and modification of the RC-135 primary mission equipment • Continue Specialized Mission Systems development for the collection of both air and ground signals.			
FY 2019 to FY 2020 Increase/Decrease Statement: There is a $2.7M FY20 reduction being used for other Air Force priorities.			
Accomplishments/Planned Programs Subtotals	14.297	14.223	11.787

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305207F / *Manned Reconnaissance Systems*

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APAF 05 Line Item DARP01: *RC-135*	204.559	394.532	227.673	-	227.673	205.440	203.642	205.519	86.108	Continuing	Continuing
• APAF 06 Line Item DARP01: *Initial Spares/Repair Parts*	45.831	49.520	50.448	-	50.448	51.352	52.380	53.332	24.730	Continuing	Continuing
• APAF 07 Line Item DARP01: *Aircraft Support Equipment & Facilities*	29.700	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• OPAF 04 Line Item 846070: *DARP RC-135*	26.685	26.262	26.716	-	26.716	27.204	27.685	28.178	28.685	Continuing	Continuing
• RDTE 07 PE 0304260F: *Airborne SIGINT Enterprise*	59.706	50.577	33.396	-	33.396	42.195	43.071	43.856	44.646	Continuing	Continuing

Remarks

E. Acquisition Strategy

The RC-135 RIVET JOINT, COBRA BALL, and COMBAT SENT configured aircraft are maintained and kept technologically relevant through a baseline or incremental upgrade acquisition strategy. Technology upgrades and Quick Reaction Capability (QRC) developments are acquired through the 645 AESG in accordance with the BIG SAFARI Program Management Directive (PMD) and Class Justification and Approval (J&A) document for acquisition of supplies and services using an "other than full and open competition" criteria. The supplies and services procured by 645 AESG satisfy National Security requirements (FAR 6.302-6) through the use of their standing J&A or address Unusual and Compelling Urgency requirements (FAR 6.302-2) through an individually prepared J&A supported by the BIG SAFARI Life Cycle Management Plan (LCMP) across the full spectrum of system life cycle management from developmental engineering to system retirement ("cradle to grave") support. Due to the ever changing threat and rapidly evolving electromagnetic combat environment encountered during our prolonged commitment to Overseas Contingency Operations (OCO), the acquisition program manager has the authority to redirect funding as necessary to meet current stated and emerging Combatant Command (CCMD) and/or Intelligence Community (IC) requirements to better meet the war fighting objectives.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305207F / *Manned Reconnaissance Systems*	**Project (Number/Name)** 674754 / *RC-135 Systems*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Operational Systems Development	SS/ Various	L-3 Technologies : Greenville, TX	-	14.297	Dec 2017	14.223	Dec 2018	11.787	Dec 2019	-		11.787	Continuing	Continuing	-
		Subtotal	-	14.297		14.223		11.787		-		11.787	Continuing	Continuing	N/A

Remarks

All activity is based around the Programmed Depot Maintenance (PDM) airframe and missions systems schedule which includes multiple contracts and organizations with overlapping and continuous periods of performance. Due to the rapidly changing threat environment encountered during our prolonged commitment to Overseas Contingency Operations (OCO), the acquisition program manager has the authority to redirect funding as necessary to meet current stated and emerging Combatant Command (CCMD) and/or Intelligence Community (IC) requirements.

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	14.297		14.223		11.787		-		11.787	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305207F / *Manned Reconnaissance Systems*	**Project (Number/Name)** 674754 / *RC-135 Systems*

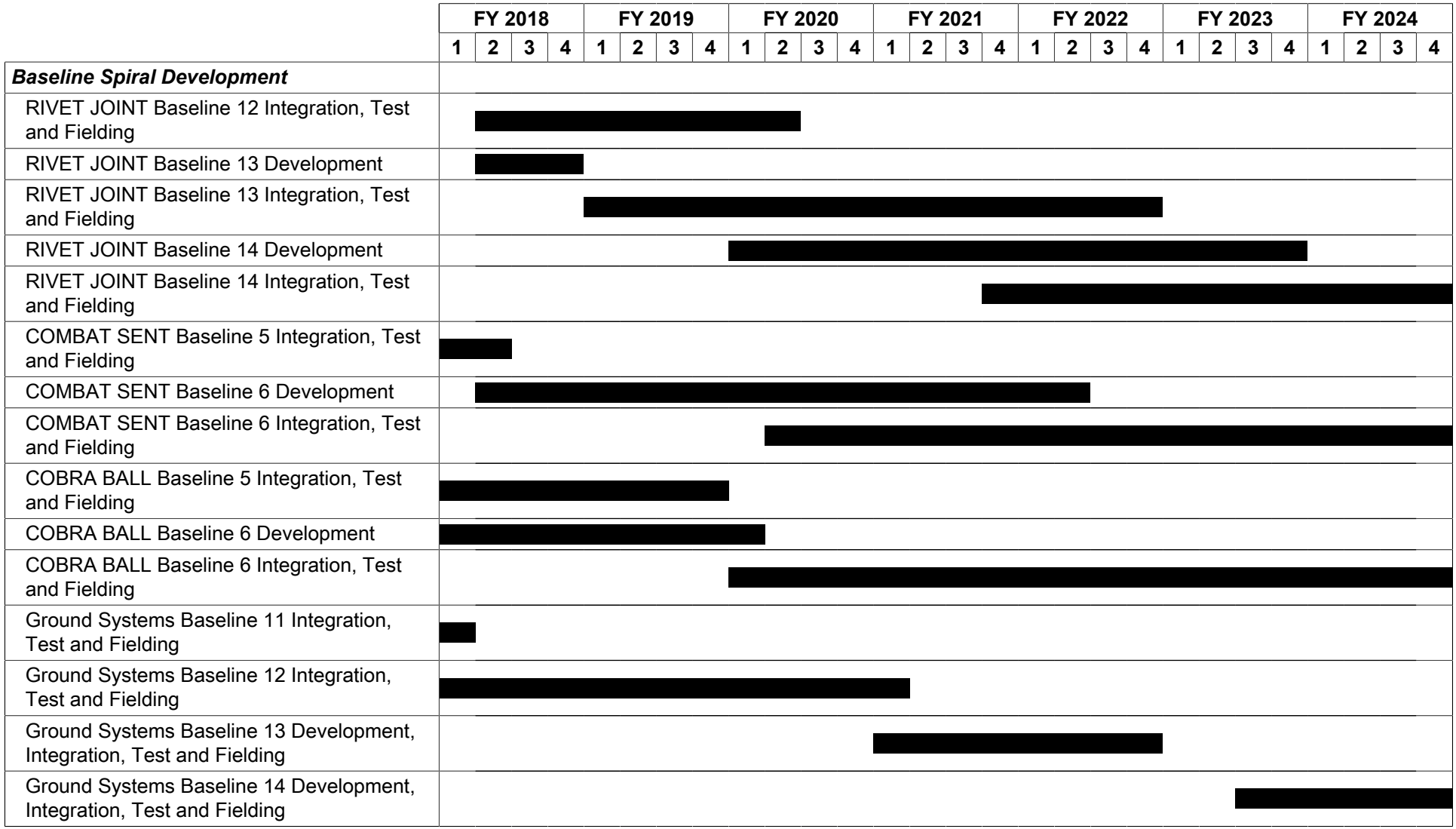

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305207F / *Manned Reconnaissance Systems*	**Project (Number/Name)** 674754 / *RC-135 Systems*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Baseline Spiral Development				
RIVET JOINT Baseline 12 Integration, Test and Fielding	2	2018	2	2020
RIVET JOINT Baseline 13 Development	2	2018	4	2018
RIVET JOINT Baseline 13 Integration, Test and Fielding	1	2019	4	2022
RIVET JOINT Baseline 14 Development	1	2020	4	2023
RIVET JOINT Baseline 14 Integration, Test and Fielding	4	2021	4	2024
COMBAT SENT Baseline 5 Integration, Test and Fielding	1	2018	2	2018
COMBAT SENT Baseline 6 Development	2	2018	2	2022
COMBAT SENT Baseline 6 Integration, Test and Fielding	2	2020	4	2024
COBRA BALL Baseline 5 Integration, Test and Fielding	1	2018	4	2019
COBRA BALL Baseline 6 Development	1	2018	1	2020
COBRA BALL Baseline 6 Integration, Test and Fielding	1	2020	4	2024
Ground Systems Baseline 11 Integration, Test and Fielding	1	2018	1	2018
Ground Systems Baseline 12 Integration, Test and Fielding	1	2018	1	2021
Ground Systems Baseline 13 Development, Integration, Test and Fielding	1	2021	4	2022
Ground Systems Baseline 14 Development, Integration, Test and Fielding	3	2023	4	2024

Note

Ground systems include the RIVET JOINT Mission Trainers (RJMT), Mission Crew Training Systems (MCTS), Ground Data Processing System (GDPS), Modular Processing System (MPS), Airborne Capabilities Extension Systems (ACES) and Operational Flight Trainers (OFT). Baseline upgrades are determined by the aircraft programmed depot maintenance schedule. Hardware, firmware or software enhancements to the ground systems are set up to match the aircraft baseline upgrades. Typically, baseline configuration changes and enhancements are incorporated first into the RJMTs and OFTs, and then integrated into GDPS, MCTS, MPS, and ACES. Delivery of the enhancements to the RJMTs and OFTs are planned to arrive concurrently, if not slightly prior, to the delivery of the first aircraft with an upgraded cockpit or mission system in a given baseline configuration to allow for aircrew and ground personnel training and qualification.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305208F / *Distributed Common Ground/Surface Systems*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	38.064	54.054	25.009	0.000	25.009	25.443	25.972	26.447	26.923	Continuing	Continuing
674826: *Common Imagery Ground / Surface Systems*	-	38.064	28.054	25.009	0.000	25.009	25.443	25.972	26.447	26.923	Continuing	Continuing
675246: *MQ-9 Development and Fielding*	-	0.000	26.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

Air Force Distributed Common Ground System (AF DCGS) is the Combat Air Force (CAF) weapon system architecture for planning and direction, collection, processing and exploitation, analysis and production, and dissemination (PCPAD) of data from Intelligence, Surveillance, and Reconnaissance (ISR) missions. Since AF DCGS is also a major component of the DoD DCGS, the system is designed to complement and interoperate with the DoD, Army, Navy and Marine Corps DCGS. The AF DCGS mission is to provide Joint Task Force (JTF) Commanders, Air Component Commanders, Unified Commands, and other directed organizations with global, time- sensitive ISR PCPAD across the spectrum of military operations. AF DCGS is a multi-INT network linked weapon system (AN/GSQ-272) capable of exploiting intelligence data from manned platforms, remotely piloted aircraft (RPA), non-traditional ISR platforms, national and commercial satellites, and other collection systems. AF DCGS is designed to support joint operational requirements by providing a common PCPAD means to provide time-sensitive intelligence to field commanders and in support of the Air Operations Center (AOC) mission requirements. Currently, the AF DCGS worldwide architecture is composed of two worldwide core sites, three regional core sites, two remote Air Force Forces (AF FOR) sites, four National Mission Partner (NMP) sites, three support sites, and multiple National Guard Bureau (NGB) sites. Currently, AF DCGS is supporting ongoing operations from forward deployed and in-garrison CONUS and OCONUS based locations. The system employs a concept of data distribution, information sharing and collaborative work centers. AF DCGS provides the national leadership and the warfighter with integrated and interoperable national and airborne reconnaissance by providing quality and fused Signals Intelligence (SIGINT), Measurement and Signature Intelligence (MASINT), and Geospatial Intelligence (GEOINT) tailored to the warfighter for all levels of conflict.

AF DCGS is transforming by integrating the necessary technologies and tools to provide increased capabilities and meet emerging and urgent operational needs. These efforts will also integrate commercial-off-the-shelf and government-off-the-shelf upgrades to provide current technologies and achieve necessary application services. The next series of upgrades will meet the operational need to integrate new and/or improved sensor capabilities, as well as enhance interoperability by migrating to an Open Architecture (OA) to improve data sharing ability per DoD direction.

Program management consists of five ACAT III efforts: GEOINT Transformation, SIGINT Transformation, Multi-INT, Network Infrastructure Transformation, and DCGS Reference Imagery Transition (DRT): (Note: GEOINT Baseline 4.1, System Release 3.0 and SENSORS ACAT were closed in FY18 and Sensors funding/projects were merged into GEOINT Transformation ACAT in FY19).

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305208F / *Distributed Common Ground/Surface Systems*

1. GEOINT Transformation: The GEOINT Transformation effort rapidly integrates new capabilities, enables quick/seamless integration of new sensors, data types, sensor planning, command and control (C2) and migrates GEOINT-specific applications & capabilities into the open architecture framework.
2. SIGINT Transformation: Rapidly integrate new capabilities, leverage mission partner methods and tools, exchange data, and migrate the SIGINT-specific applications/ capabilities into the open architecture framework.
3. Multi-INT: Rapidly integrate new multi-INT capabilities/enterprise applications and facilitate enterprise-wide collaboration capabilities. Addresses program office test and evaluation activities.
4. Network Infrastructure Transformation: The Infrastructure Transformation effort modernizes the AF DCGS infrastructure to a cyber-resilient, open, scalable, cloud-enabled hybrid Platform as a Service, improving data ingest, transfer, and storage capabilities, collaboration, and content driven discovery. Initial OA DCGS Platform as a Service, along with migration to a hub-based architecture, represents the AF DCGS program's initial efforts to eventually migrate to a hybrid cloud (mix of private on-premises and public cloud) architecture
5. *DRT: The Air Force DCGS Reference Imagery Transition (DRT) effort provides data ingest, transfer, and storage capabilities for NGA reference imagery data.

NOTES:
*For FY20, this effort does not have any associated investment funding.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	27.501	54.054	25.009	0.000	25.009
Current President's Budget	38.064	54.054	25.009	0.000	25.009
Total Adjustments	10.563	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	10.563	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

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305208F / *Distributed Common Ground/Surface Systems*

Change Summary Explanation

In FY18, Congress added $10.563M in RDT&E funding for acceleration of SIGINT modernization.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305208F / *Distributed Common Ground/Surface Systems*	Project (Number/Name) 674826 / *Common Imagery Ground / Surface Systems*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
674826: *Common Imagery Ground / Surface Systems*	-	38.064	28.054	25.009	0.000	25.009	25.443	25.972	26.447	26.923	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Program management consists of five ACAT III efforts: GEOINT Transformation, SIGINT Transformation, Multi-INT, Network Infrastructure Transformation, and DCGS Reference Imagery Transition (DRT):

1.GEOINT Transformation: The GEOINT Transformation effort rapidly integrates new capabilities, enables quick/seamless integration of new sensors, data types, sensor planning, command and control (C2) and migrates GEOINT-specific applications & capabilities into the open architecture framework.
2. SIGINT Transformation: Rapidly integrate new capabilities, leverage mission partner methods and tools, exchange data, and migrate the SIGINT-specific applications/ capabilities into the open architecture framework.
3. Multi-INT: Rapidly integrate new multi-INT capabilities/enterprise applications and facilitate enterprise-wide collaboration capabilities. Addresses program office test and evaluation activities.
4. Network Infrastructure Transformation: The Infrastructure Transformation effort modernizes the AF DCGS infrastructure to a cyber-resilient, open, scalable, cloud-enabled hybrid Platform as a Service, improving data ingest, transfer, and storage capabilities, collaboration, and content driven discovery. Initial OA DCGS Platform as a Service, along with migration to a hub-based architecture, represents the AF DCGS program's initial efforts to eventually migrate to a hybrid cloud (mix of private on-premises and public cloud) architecture
5. *DRT: The Air Force DCGS Reference Imagery Transition (DRT) effort provides data ingest, transfer, and storage capabilities for NGA reference imagery data.

NOTES:
*For FY20, this effort does not have any associated RDT&E funding. The Other Procurement Air Force (OPAF) funding is exhibited in the Procurement Documentation (WSC846080, DCGS-AF).

Intelligent Modeling and Predictive Analysis of Cyberspace Targeting (IMPACT) (Formerly known as Project SUTER) effort was moved from PE 0305221F to PE 0305208F in FY19. IMPACT develops concepts, Tactics/Techniques/Procedures (TTPs) and technologies for synchronizing the capabilities of ISR and non-kinetic capabilities in a coordinated fashion with traditional kinetic weapons to prosecute targets connected together or dependent upon some form of communications network.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver AF DCGS weapon system capability. The use of such program funds would be in 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605833, and 0605898F.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305208F / *Distributed Common Ground/Surface Systems*	**Project (Number/Name)** 674826 / *Common Imagery Ground / Surface Systems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: GEOINT Transformation ***Description:*** The GEOINT Transformation effort rapidly integrates new capabilities and migrates GEOINT-specific applications and capabilities into the open architecture framework. Furthermore, GEOINT Transformation provides continuous and incremental improvement to the capability for planning and direction, collection, processing and exploitation, analysis and production, and dissemination (PCPAD) of advanced imagery intelligence. ***FY 2019 Plans:*** Continue the Full Motion Geo-Coordinate Accuracy effort. ***FY 2020 Base Plans:*** Will continue High Altitude Agile Release Train (HA ART) to rapidly integrate new capabilities and migrate GEOINT-specific applications & capabilities into the OA framework. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease is a return to normal funding. FY19 included OCO funds.	0.000	3.500	0.500	-	0.500
Title: SIGINT Transformation ***Description:*** The Signal Intelligence (SIGINT) Transformation effort rapidly integrates new capabilities, leverages mission partner methods and tools, improves data exchange, and migrates the SIGINT-specific applications/capabilities into the open architecture framework. The SIGINT Segment provides command and control (C2) of ISR sensors, data processing, and data distribution to the customers in near real time from connected sensors at both core and remote sites. ***FY 2019 Plans:*** Continue USAF SIGINT Sensor Data Ingest (SSDI) effort to enable AF DCGS to seamlessly operate with National Mission Partner (NMP); provides the ability to share intelligence products and metadata directly with the NMP processing environment for the purpose of supporting real time geolocation and target identification as well as access to NMP tools and services for near real-time streaming of sensor data; automated language and speaker ID; and analytic and reporting applications. ***FY 2020 Base Plans:***	30.945	6.420	1.000	0.000	1.000

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305208F / *Distributed Common Ground/Surface Systems*	**Project (Number/Name)** 674826 / *Common Imagery Ground / Surface Systems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Will continue the SIGINT Transformation Agile Release Train (SIGINT ART) to integrate new capabilities, leverage mission partner methods and tools, exchange data, and migrate SIGINT-specific capabilities into OA. ***FY 2020 OCO Plans:*** None ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decreased due to completion of SIGINT Sensor Data Ingest (SSDI) project.					
Title: Multi-INT Transformation ***Description:*** Provides and supports Open Architecture-based Enterprise Services, moves to commodity hardware and a virtual desktop environment, facilitates enterprise-wide collaborative tools, and integrates IMPACT capability into Open Architecture DCGS. ***FY 2019 Plans:*** • Continue the Multi-Intelligence Transformation Agile Release Train (ART) effort. • Continue Data Analytics (Real Time Analytics (RTA), Content Driven Analytics (CDA), Project Maven) integration of GOTS and COTS-provided algorithms. • Continue the Enterprise Communications Capability effort to replace existing AF DCGS legacy proprietary, disparate, and end-of-life types of communications methods, hardware, tools and software applications with new, secure, accreditable, non-proprietary, open architecture enterprise hardware, tools, and applications to meet mission needs. • Continue transitioning Intelligent Modeling and Predictive Analysis of Cyberspace Targeting (IMPACT) effort to AF DCGS. ***FY 2020 Base Plans:*** • Will continue the Multi-Intelligence Transformation ART effort. • Will continue Data Analytics (RTA, CDA, and Project Maven) integration of GOTS and COTS provided algorithms. • Will continue the Enterprise Communications Capability (ECC)effort to replace existing AF DCGS legacy proprietary, disparate, and end-of-life types of communications methods, hardware, tools and software applications with new, secure, accreditable, non-proprietary, open architecture enterprise hardware, tools, and applications to meet mission needs.	4.081	14.409	12.834	-	12.834

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305208F / *Distributed Common Ground/Surface Systems*	**Project (Number/Name)** 674826 / *Common Imagery Ground / Surface Systems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
• Will continue Intelligent Modeling and Predictive Analysis of Cyberspace Targeting (IMPACT) effort. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minimal funding decrease					
Title: Network Infrastructure Transformation ***Description:*** The Network Infrastructure Transformation effort modernizes the AF DCGS infrastructure to improve data ingest, transfer, and storage capabilities while migrating the network toward a cloud architecture. A primary task is to replace the Asynchronous Transfer Mode (ATM) capability with a non-ATM based Transport Architecture. ***FY 2019 Plans:*** • Continue to develop, test and demonstrate the ATM-replacement Network Transport Architecture. • Continue to develop and demonstrate technical feasibility of utilizing secure commercial clouds (e.g., the Intelligence Community's Commercial Cloud Services (C2S)). ***FY 2020 Base Plans:*** • Will continue to develop, test and demonstrate the ATM-replacement Network Transport Architecture. • Will continue to develop and demonstrate technical feasibility of utilizing secure commercial clouds (e.g., the Intelligence Community's Commercial Cloud Services (C2S)). • Will continue development of next WST (Weapon System Trainer) agile release. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding increase due to increased work on the WST effort.	3.038	3.725	10.675	-	10.675
Accomplishments/Planned Programs Subtotals	38.064	28.054	25.009	0.000	25.009

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPAF 04 Line Item, 846080: *DCGS-AF*	243.141	354.917	94.137	-	94.137	100.886	133.207	135.577	138.017	Continuing	Continuing

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305208F / *Distributed Common Ground/Surface Systems*	**Project (Number/Name)** 674826 / *Common Imagery Ground / Surface Systems*

D. Acquisition Strategy

The AF DCGS acquisition strategy is to transition the weapon system to an open hardware and software architecture. Also, the strategy leverages approved lean and agile industry practices to increase delivery cycles and incorporates remote installation capabilities to speed up the installation tempo.

Contracting strategy involves a combination of Basic Ordering Agreements (BOAs), Indefinite Delivery/Indefinite Quantity (IDIQ) contracts awarded to execute program funds and delivery/task orders are negotiated/awarded individually.

The program is managed as five ACAT III efforts: GEOINT Transformation, SIGINT Transformation, Multi-INT-1, Network Infrastructure Transformation, and DCGS Reference Imagery Transition (DRT).

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305208F / *Distributed Common Ground/Surface Systems*	**Project (Number/Name)** 674826 / *Common Imagery Ground / Surface Systems*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GEOINT Transformation	Various	Various : Various	-	-		3.500	Jan 2019	0.500	Feb 2020	-		0.500	Continuing	Continuing	-
SIGINT Transformation	Various	Various : Various	-	28.098	Dec 2017	6.000	Jul 2019	1.000	Jul 2020	-		1.000	Continuing	Continuing	-
Multi-Intelligence	Various	Various : Various	-	3.529	Nov 2017	13.304	Feb 2019	11.759	Jan 2020	-		11.759	Continuing	Continuing	-
Network Infrastructure Transformation	Various	Various : Various	-	3.058	Jun 2018	3.500	Feb 2019	10.000	Feb 2020	-		10.000	Continuing	Continuing	-
		Subtotal	-	34.685		26.304		23.259		-		23.259	Continuing	Continuing	N/A

Remarks

Note on "various" entries - Contract Method, Contract Type, Performing Activity, Target Value of Contract are entered as "various" because there are multiple projects within each upgrade and depending on the type of effort to be completed determines the contract vehicle to use. There is no way on this document to delineate the contracts that support each upgrade as they are numerous.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Multi-Intelligence	Various	Various : Various	-	0.118	Mar 2018	0.251	Jan 2019	0.251	Jan 2020	-		0.251	Continuing	Continuing	-
		Subtotal	-	0.118		0.251		0.251		-		0.251	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMA	Various	Various : Various	-	3.261	Nov 2017	1.499	Dec 2018	1.499	Dec 2019	-		1.499	Continuing	Continuing	-
		Subtotal	-	3.261		1.499		1.499		-		1.499	Continuing	Continuing	N/A

Remarks

Note on "various" entries - Contract Method, Contract Type, Performing Activity, Target Value of Contract are entered as "various" because there are multiple projects within in each upgrade and depending on the type of effort to be completed determines the contract vehicle to use. There is no way on this document to delineate the contracts that support each upgrade as they are numerous.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305208F / *Distributed Common Ground/Surface Systems*	Project (Number/Name) 674826 / *Common Imagery Ground / Surface Systems*	

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	38.064		28.054		25.009		-		25.009	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305208F / *Distributed Common Ground/Surface Systems*	**Project (Number/Name)** 674826 / *Common Imagery Ground / Surface Systems*

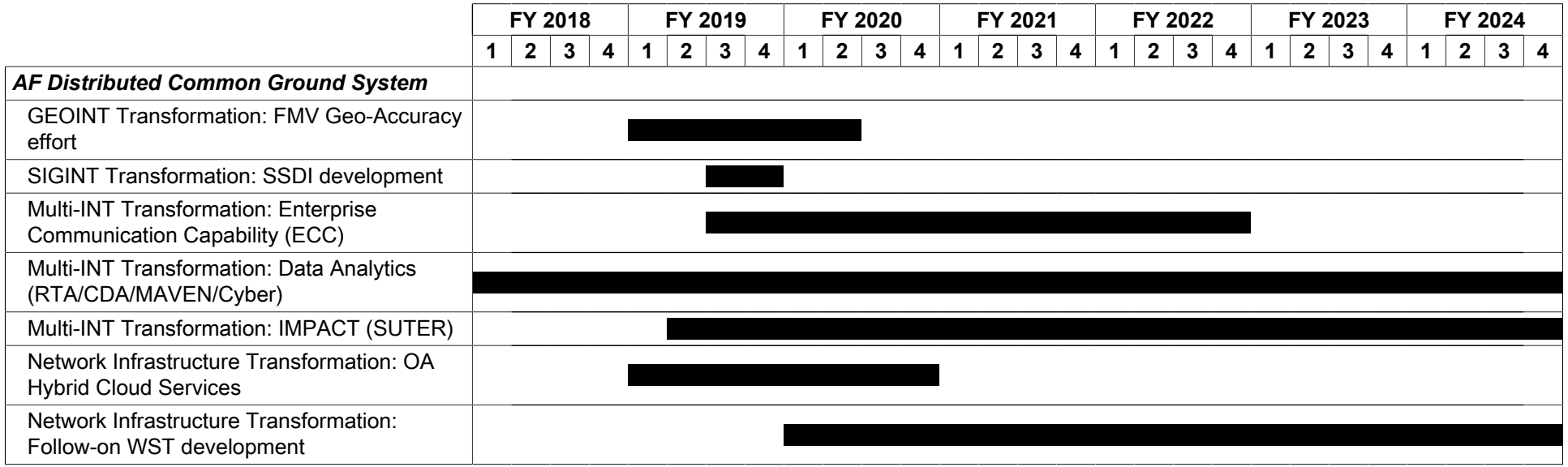

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305208F / *Distributed Common Ground/Surface Systems*	**Project (Number/Name)** 674826 / *Common Imagery Ground / Surface Systems*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
AF Distributed Common Ground System				
GEOINT Transformation: FMV Geo-Accuracy effort	1	2019	2	2020
SIGINT Transformation: SSDI development	3	2019	4	2019
Multi-INT Transformation: Enterprise Communication Capability (ECC)	3	2019	4	2022
Multi-INT Transformation: Data Analytics (RTA/CDA/MAVEN/Cyber)	1	2018	4	2024
Multi-INT Transformation: IMPACT (SUTER)	2	2019	4	2024
Network Infrastructure Transformation: OA Hybrid Cloud Services	1	2019	4	2020
Network Infrastructure Transformation: Follow-on WST development	1	2020	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305208F / *Distributed Common Ground/Surface Systems*	Project (Number/Name) 675246 / *MQ-9 Development and Fielding*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675246: *MQ-9 Development and Fielding*	-	0.000	26.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Due to a Database Error, the additional $26M in FY19 OCO for "MQ-9 Development and Fielding" (Project 675246) was erroneously added to PE 0305208. This funding belongs in Air Force PE 0305829F,"Video Data Link".

Video Data Link (VDL) Family of Systems (FoS) provides situational awareness (SA) to the operator on the ground using real time Full Motion Video (FMV) from secure line of sight links to airborne ISR, NTISR, PR and SF platforms. The FoS consists of interoperable Mounted (Airborne/Ground) and Handheld terminal variants. Current variants are utilized with 20 different platforms. Crypto Core Modernization (CCM) driven by NSA will create an imminent DMS issue by FY21; the current VDL equipment is incompatible with the enhanced Crypto Core.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver nuclear weapon support capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Video Data Link	-	26.000	0.000	-	0.000
Description: Video Data Link (VDL) Family of Systems (FoS) provides situational awareness (SA) to the operator on the ground using real time Full Motion Video (FMV) from secure line of sight links to airborne ISR, NTISR, PR and SF platforms. ***FY 2019 Plans:*** -FY19 OCO: Provide technology refresh for Mounted and Airborne Video Data Link. Focus areas will be Mobile Ad-Hoc Networking, updated cryptographic hardware, and improved waveforms for LPI/LPD (Low Probability of Intercept/Low Probability of Detection) operation. ***FY 2020 Base Plans:*** - Will continue technology refresh for Mounted and Airborne Video Data Link. Focus areas will be					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305208F / *Distributed Common Ground/Surface Systems*	**Project (Number/Name)** 675246 / *MQ-9 Development and Fielding*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Mobile Ad-Hoc Networking, updated cryptographic hardware, and improved waveforms for LPI/LPD (Low Probability of Intercept/Low Probability of Detection) operation. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** No additional funds for FY20					
Accomplishments/Planned Programs Subtotals	-	26.000	0.000	-	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Video Data Link acquisition strategy will be to conduct a competitive acquisition that will involve a CPIF contract vehicle to encourage proposals to integrate the required capability rapidly and within the identified budget.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305208F / *Distributed Common Ground/Surface Systems*	**Project (Number/Name)** 675246 / *MQ-9 Development and Fielding*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Video Data Link Crypto Core Modernization	TBD	AFMAA/WIS, SOF/PR & BA : Dayton, OH	-	-		23.000		-		-		-	Continuing	Continuing	23.000
		Subtotal	-	-		23.000		-		-		-	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMA	TBD	Not specified. : TBD	-	-		3.000		-		-		-	Continuing	Continuing	3.000
		Subtotal	-	-		3.000		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		26.000		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305208F / *Distributed Common Ground/Surface Systems*	**Project (Number/Name)** 675246 / *MQ-9 Development and Fielding*

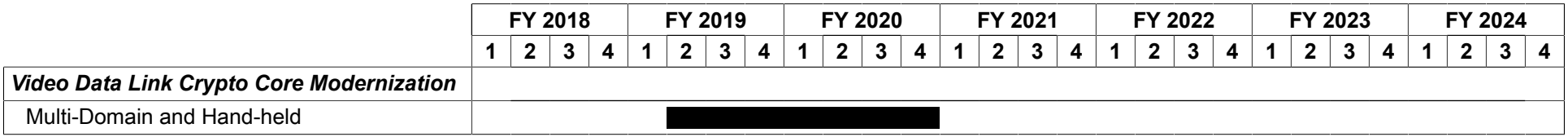

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305208F / *Distributed Common Ground/Surface Systems*	**Project (Number/Name)** 675246 / *MQ-9 Development and Fielding*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Video Data Link Crypto Core Modernization				
Multi-Domain and Hand-held	2	2019	4	2020

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305220F / *RQ-4 UAV*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	663.498	222.693	221.690	191.733	0.000	191.733	243.252	217.327	165.284	57.201	Continuing	Continuing
675145: *RQ-4 Block 30*	489.373	34.312	25.950	30.761	0.000	30.761	27.490	25.913	26.384	26.859	0.000	687.042
675146: *RQ-4 Block 40*	174.125	0.139	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	174.264
675149: *RQ-4 Capability Enhancements*	0.000	188.242	195.740	160.472	0.000	160.472	215.762	191.414	138.900	30.342	Continuing	Continuing
67RTIP: *MP-RTIP*	0.000	0.000	0.000	0.500	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.500

Program MDAP/MAIS Code: 252
Project MDAP/MAIS Code(s): 293

Note

The sum of all Prior Years is actually $2,116.752 million more than the represented total due to several projects ending.

A. Mission Description and Budget Item Justification

This program element funds related Air Force projects sharing the RQ-4 platform in common: the RQ-4 Block 30, the RQ-4 Block 40, RQ-4 Capability Enhancements, and Multi-Platform Radar Technology Insertion Program (MP-RTIP). The RQ-4 Block 30 and Block 40 projects support the development and testing of the ACAT 1C RQ-4 capability and the initiation of the major modification ACAT programs. The majority of the modernization funding was transferred to the Capability Enhancement project (675149) to support upgrades and modifications, including established ACAT I and II programs, to the fielded RQ-4 weapon system to meet evolving threats and warfighter requirements. The MP-RTIP project completes development and testing of the baseline MDAP MP-RTIP sensor capability.

When judged feasible and affordable, this program will participate in the development, testing, and implementation of international standards to enhance joint, allied, and coalition interoperability. Studies and activities may be initiated to further explore the utility of incorporating the emerging architectural standards such as the USAF Unmanned Aerial Systems (UAS) Command and Control Initiative (UCI) or the DoD's Unmanned Control Segment standards (UCS) and Open Mission Systems (OMS). Ground Segment Modernization Program (GSMP) and Communication System Modernization Program (CSMP) will incorporate UCI and UCS standards.

Per direction of USD(AT&L), the RQ-4 program was restructured from the original project 675144 (Baseline) into multiple projects: (1) Block 30, (2) Block 40, (3) GroundSegment/Communications System, and (4) Common-Airborne Sense and Avoid (C-ABSAA). In FY17 the Ground Segment/Communications System project (675147) ended. Prior year funds in the amount of $2031.377M were accounted for in project 675144 and $85.375M were accounted for in project 675147.

The FY2018 funding was increased by $8.000 million to develop a Block 40 ISR Payload Adapter design and documentation.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305220F / *RQ-4 UAV*

This program element may include necessary civilian pay expenses required to manage, execute, and deliver RQ-4 UAV weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	214.849	221.690	214.272	0.000	214.272
Current President's Budget	222.693	221.690	191.733	0.000	191.733
Total Adjustments	7.844	0.000	-22.539	0.000	-22.539
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	8.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	-0.156	0.000	-22.539	0.000	-22.539

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2018	FY 2019
Project: 675149: *RQ-4 Capability Enhancements*		
Congressional Add: *RQ-4 Block 40 ISR Payload Adapter*	8.000	0.000
Congressional Add Subtotals for Project: 675149	8.000	0.000
Congressional Add Totals for all Projects	8.000	0.000

Change Summary Explanation

- FY 2020 funds adjustment attributed to Air Force adjustments/re-phasing for higher priorities (-$46.8M), realignment for proper execution (+$4.3M), and RDT&E increase for Mobile User Objective System (MUOS) (+$20.0M).

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305220F / *RQ-4 UAV*	Project (Number/Name) 675145 / *RQ-4 Block 30*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675145: *RQ-4 Block 30*	489.373	34.312	25.950	30.761	0.000	30.761	27.490	25.913	26.384	26.859	0.000	687.042
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The RQ-4 Block 30 Project was directed by an Acquisition Decision Memorandum (ADM) signed 14 Jun 2011 by USD (AT&L). At the time of the ADM signature, and subsequent designation of projects, budgets had already been finalized. Prior budgets for all projects are captured under the RQ-4 Baseline project, as its related Project (675144) was the core project for the RQ-4 program prior to the directed restructure.

A. Mission Description and Budget Item Justification

The RQ-4 Remotely Piloted Aircraft (RPA) provides a high altitude, deep look, long-endurance Intelligence, Surveillance, and Reconnaissance (ISR) capability that complements space and other airborne collectors during peacetime, crisis, and war-fighting scenarios. RDT&E funding in this project supports design, development, integration, and testing of capabilities needed to meet validated requirements for Block 30 aircraft, including continuing aircraft system upgrade for Enhanced Integrated Sensor Suite (EISS) sensors, the Airborne Signals Intelligence Payload (ASIP), and alternate sensor payloads.

This funding also supports aircraft systems upgrades to include continuing airframe updates, aircraft operations surety, cybersecurity, airspace and interoperability enhancements, information assurance, and mission critical repair of Government Furnished Equipment (GFE).

Activities include mission planning interoperability enhancements, weather capability enhancements and testing, airspace and interoperability enhancements and updates, airframe and software upgrades and deficiency report resolution across RQ-4 fleet, periodic Operational Flight Program updates and releases, sensor interoperability and communication enhancements and alternate sensor upgrades, upgrades to ASIP Signals Intelligence (SIGINT) sensor, Identification Friend or Foe (IFF) Mode 5 Automatic Dependent Surveillance-Broadcast (ADS-B) development and testing, development and testing activities associated with enhancing sensor capability and sensor integration, integration of alternate sensors, development and testing of ice protection system, support of demonstration/development and technology insertion, and studies and analysis supporting future system enhancements.

This project supports system engineering/program management, test and evaluation, management services, and fielding support for all RQ-4 projects. This reflects contracting/acquisition strategy for these common elements within the Global Hawk program to provide efficiencies.

The RQ-4 program will maintain and upgrade interoperability for Blocks 20/30/40 with system of systems partners and continue to incorporate applicable synergies with other platforms such as the U.S. Navy's Triton, other RPA weapon systems, and Processing, Exploitation & Dissemination (PED) elements. The networking capability for intelligence dissemination is required to provide the data transport interface between the Weapons System, Operations Centers, and external Intelligence Community customers.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305220F / *RQ-4 UAV*	**Project (Number/Name)** 675145 / *RQ-4 Block 30*

This program element may include necessary civilian pay expenses required to manage, execute, and deliver RQ-4 UAV weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

When judged feasible and affordable, this program will participate in the development, testing, and implementation of international standards to enhance joint, allied, and coalition interoperability. Studies and activities may be initiated to further explore the utility of incorporating the emerging architectural standards such as the USAF Unmanned Aerial Systems (UAS) Command and Control Initiative (UCI) or the DoD's Unmanned Control Segment standards (UCS) and Open Mission Systems (OMS). Ground Segment Modernization Program (GSMP) and Communication System Modernization Program (CSMP) will incorporate UCI and UCS standards.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: RQ-4 Block 30 Development and Demonstration	28.521	8.377	3.300
Description: Global Hawk Unmanned Aerial Vehicle Development and Demonstration includes enterprise management, test and evaluation, software integration, and fielding support for all RQ-4 projects as well as periodic Operational Flight Program updates and releases, studies and analysis supporting future system enhancements. ***FY 2019 Plans:*** - Continue upgrades to ASIP SIGINT and EISS sensors - Continue airspace integration activities including comm interoperability and upgrades, cybersecurity and information assurance and reliability & maintainability, and associated testing - Conduct Battlefield Airborne Communication Node enhanced weather capability testing ***FY 2020 Plans:*** - Conclude EISS modification effort ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding decreased due to program transitioning modernization into separate Accomplishments/Planned Programs			
Title: RQ-4 MS-177 Sensor Integration	3.362	0.000	0.000
Description: Integration of MS-177 multispectral sensor into Block 30 ***FY 2019 Plans:*** - Continue in project 675149 ***FY 2020 Plans:*** - N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** - N/A			
Title: RQ-4 Infrastructure	0.000	16.341	27.461

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305220F / *RQ-4 UAV*	**Project (Number/Name)** 675145 / *RQ-4 Block 30*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: RQ-4 Infrastructure includes systems engineering, program management, test and evaluation, and fielding support for all RQ-4 projects as well as periodic Operational Flight Program updates and releases, studies, development testing, and Other Government Costs (OGC). This funding was previously included in the RQ-4 Block 30 Development and Demonstration and Block 30 Government Test and Non-Prime Support Accomplishments/Planned Programs, including funding for the 412 TW at Edwards AFB, AFOTEC, JTIC DCGS and other interoperability partners. ***FY 2019 Plans:*** - Continue development of Operational Flight Program updates - Continue program test activities - Continue non-prime engineering and technical support and Other Government Costs ***FY 2020 Plans:*** - Will continue development of Operational Flight Program updates - Will continue program test activities - Will continue non-prime engineering and technical support and Other Government Costs ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding increased due to program transitioning modernization into separate Accomplishments/Planned Programs. Global Hawk flight test and system engineering/program management within infrastructure transitions into its own effort and will be contracted in conjunction with capability development.			
Title: Block 30 Government Test and Non-Prime Support ***Description:*** Government test, non-prime technical support and Other Government Costs (OGC) -- Funding supports RQ-4 development testing at the 412 Test Wing at Edwards AFB, CA as well as for support from Air Force Operational Test and Evaluation Center (AFOTEC), Joint Interoperability Test Command (JITC), Distributed Common Ground System (DCGS), other interoperability partners and OGC. ***FY 2019 Plans:*** - Continue non-prime engineering and technical support and Other Government Costs ***FY 2020 Plans:*** - N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding decreased because efforts were realigned to RQ-4 Infrastructure Accomplishments/Planned Program.	2.429	1.232	0.000
Accomplishments/Planned Programs Subtotals	34.312	25.950	30.761

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305220F / *RQ-4 UAV*	**Project (Number/Name)** 675145 / *RQ-4 Block 30*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APAF 05 Line Item HAWK00: *RQ-4 Mods*	78.435	123.715	1.704	-	1.704	34.121	32.117	73.520	120.261	0.000	463.873
• APAF 07 Line Item RQ4DIS: *RQ-4 Post Production Support*	56.325	40.641	47.246	-	47.246	153.940	105.070	42.900	15.982	0.000	462.104

Remarks

D. Acquisition Strategy

The RQ-4 program uses an evolutionary acquisition strategy to provide the warfighter with a near-term combat capability with increased time-phased capability improvements as technology and risk achieve satisfactory levels. Northrop Grumman Corporation is the prime contractor. A suite of contract vehicles is used for development efforts: primarily, Indefinite Delivery, Indefinite Quantity (IDIQ) contracts cover development, system upgrade, production, retrofit, fielding, and sustainment efforts. MS-177 Sensor Enhancement RDT&E is being contracted directly with the Original Equipment Manufacturer (OEM), United Technology Corporation Aerospace Systems (UTAS).

The program successfully completed Milestone (MS) C in February 2015 and is transitioning core program activities to the Operations and Support phase of the Defense Acquisition System over the next several years. Future required capabilities beyond the core Acquisition Category (ACAT) IC RQ-4 program will be completed as separate ACAT II and ACAT III modification programs.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305220F / *RQ-4 UAV*	Project (Number/Name) 675145 / *RQ-4 Block 30*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Global Hawk Engineering Manufacturing and Development	SS/ Various	Northrop Grumman Integrated Systems : San Diego, CA	312.831	28.521	May 2018	8.377	Feb 2019	3.300	Dec 2019	-		3.300	0.000	353.029	353.029
RQ-4 MS-177 Sensor Integration	SS/ Various	Various : Various	117.970	3.362	May 2018	-		-		-		-	0.000	121.332	272.886
RQ-4 Infrastructure	Various	Various : Various	0.000	-		10.590	May 2019	22.461	May 2020	-		22.461	106.646	139.697	139.697
		Subtotal	430.801	31.883		18.967		25.761		-		25.761	106.646	614.058	N/A

Remarks

Target Value of the Global Hawk EMD, IDIQ, and EPIC Contracts are not segregated by Budget Project Number.
Target Value of MS-177 contract includes $151.554M of funding in Budget Project Number 675149, RQ-4 Capability Enhancements.
Target Value of RQ-4 Infrastructure Contracts are not segregated by Budget Project Number.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Non Prime Technical Support	Various	Various : Dayton, OH	3.038	0.478	Sep 2018	-		-		-		-	0.000	3.516	3.516
		Subtotal	3.038	0.478		-		-		-		-	0.000	3.516	N/A

Remarks

Target Value of the Global Hawk effort is not segregated by Budget Project Number.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Flight Test & Evaluation	MIPR	412 TW : Edwards AFB, CA	40.626	-		5.163	Mar 2019	5.000	Nov 2019	-		5.000	0.000	50.789	50.789
		Subtotal	40.626	-		5.163		5.000		-		5.000	0.000	50.789	N/A

Remarks

Target Value of the Global Hawk effort is not segregated by Budget Project Number.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305220F / *RQ-4 UAV*	Project (Number/Name) 675145 / *RQ-4 Block 30*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMA: A&AS	Various	Various : Dayton, OH	11.082	1.444	Nov 2017	0.101	Jan 2019	-		-		-	0.000	12.627	12.627
PMA: Other Government Costs	Various	Various : Dayton, OH	3.826	0.507	Oct 2017	1.719	Oct 2018	-		-		-	0.000	6.052	6.052
		Subtotal	14.908	1.951		1.820		-		-		-	0.000	18.679	N/A

Remarks

Target Value of the Global Hawk effort is not segregated by Budget Project Number.

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	489.373	34.312		25.950		30.761		-		30.761	106.646	687.042	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305220F / *RQ-4 UAV*	**Project (Number/Name)** 675145 / *RQ-4 Block 30*

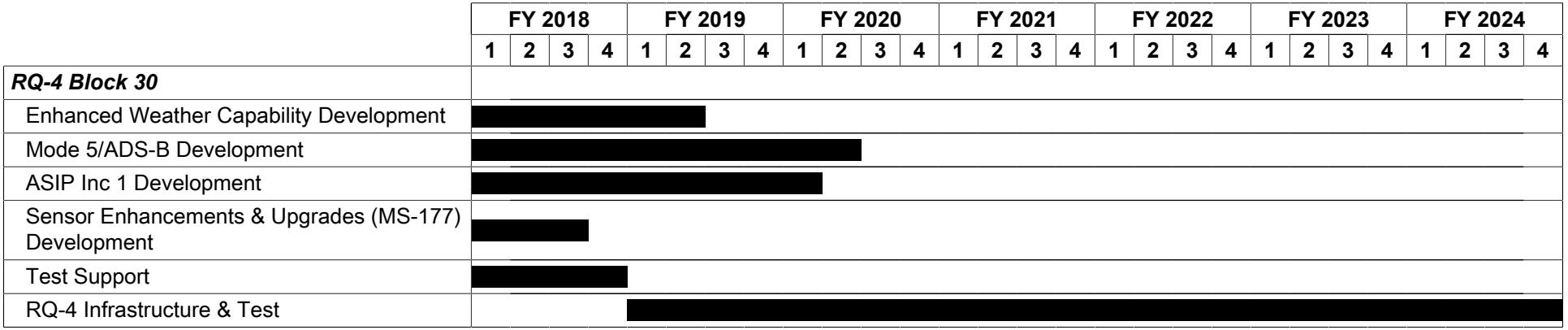

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305220F / *RQ-4 UAV*	**Project (Number/Name)** 675145 / *RQ-4 Block 30*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
RQ-4 Block 30				
Enhanced Weather Capability Development	1	2018	2	2019
Mode 5/ADS-B Development	1	2018	2	2020
ASIP Inc 1 Development	1	2018	1	2020
Sensor Enhancements & Upgrades (MS-177) Development	1	2018	3	2018
Test Support	1	2018	4	2018
RQ-4 Infrastructure & Test	1	2019	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305220F / *RQ-4 UAV*	Project (Number/Name) 675146 / *RQ-4 Block 40*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675146: *RQ-4 Block 40*	174.125	0.139	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	174.264
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The RQ-4 Block 40 Project was directed by an Acquisition Decision Memorandum (ADM) signed 14 Jun 2011 by USD (AT&L). At the time of the ADM signature, and subsequent designation of projects, budgets had already been finalized. Prior budgets for all projects are captured under the RQ-4 Baseline project, as its related Project (675144) was the core project for the RQ-4 program prior to the directed restructure.

In FY 2019, PE 0305220F, RQ-4 UAV, Project 675146, RQ-4 Block 40, efforts were transferred to PE 0305220F, RQ-4 UAV, Project 675149, RQ-4 Capability Enhancements, in order to allow greater visibility into Global Hawk modernization efforts.

A. Mission Description and Budget Item Justification

The RQ-4 Remotely Piloted Aircraft (RPA) provides a high altitude, deep look, long-endurance Intelligence, Surveillance, and Reconnaissance (ISR) capability that complements space and other airborne collectors during peacetime, crisis, and war-fighting scenarios.

RDT&E funding in this project supports design, development, integration, and testing of items needed to meet validated requirements for Block 40 aircraft, including further development, creation of additional radar modes, integration and test of the Multi-Platform Radar Technology Insertion Program (MP-RTIP) sensor capabilities. The Block 40 program provides critical Synthetic Aperture Radar (SAR) and Ground Moving Target Indicator (GMTI) data to the warfighter. This funding also supports continued aircraft/communications systems upgrade to include Identification Friend or Foe (IFF) Mode 5/Automatic Dependent Surveillance-Broadcast (ADS-B), mission planning upgrade development and testing, airspace and interoperability and communication enhancements and updates, periodic Operational Flight Program updates and releases, enhanced weather capability, development and testing of ice protection system, additional radar modes, sensor enhancements, reliability and maintainability improvements, Airframe improvements to support alternate sensors, and support of demonstration and technology insertion. Funding continues RQ-4 unique development and integration of upgraded capabilities.

When judged feasible and affordable, this program will participate in the development, testing, and implementation of international standards to enhance joint, allied, and coalition interoperability. Studies and activities may be initiated to further explore the utility of incorporating the emerging architectural standards such as the USAF Unmanned Aerial Systems (UAS) Command and Control Initiative (UCI) or the DoD's Unmanned Control Segment standards (UCS) and Open Mission Systems (OMS). Ground Segment Modernization Program (GSMP) and Communication System Modernization Program (CSMP) will incorporate UCI and UCS standards.

The RQ-4 program will maintain capability and interoperability for Block 40 including efforts with system of systems partners and continue to incorporate applicable synergies with other platforms, such as the U.S. Navy's Triton, other RPA weapon systems, and Processing, Exploitation & Dissemination (PED) elements.

Activities also include studies and analysis, support to future system enhancements, communication and interoperability enhancements, current and future program planning, and project execution.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305220F / *RQ-4 UAV*	**Project (Number/Name)** 675146 / *RQ-4 Block 40*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: RQ-4 Block 40 Development and Demonstration	0.139	0.000	0.000
Description: RQ-4 Block 40 Payload and Aircraft/Communications Development and Demonstration as well as periodic Operational Flight Program updates and releases ***FY 2019 Plans:*** - N/A ***FY 2020 Plans:*** - N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** - N/A			
Accomplishments/Planned Programs Subtotals	0.139	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APAF 05 Line Item HAWK00: *RQ-4 Mods*	78.435	123.715	1.704	-	1.704	34.121	32.117	73.520	120.261	0.000	463.873
• APAF 07 Line Item RQ4DIS: *RQ-4 Post Production Support*	56.325	40.641	47.246	-	47.246	153.940	105.070	42.900	15.982	0.000	462.104
• RDTE 07 PE 0305238F: *NATO AGS*	44.729	51.527	32.567	-	32.567	1.787	0.796	0.810	0.825	0.000	133.041

Remarks

D. Acquisition Strategy

The RQ-4 program uses an evolutionary acquisition strategy to provide the warfighter with a near-term combat capability with increased time-phased capability improvements as technology and risk achieve satisfactory levels. Northrop Grumman Corporation is the prime contractor. A suite of contract vehicles is used for development efforts: a legacy Engineering & Manufacturing Development (EMD) "C" contract is being phased out with the completion of current efforts; Indefinite Delivery, Indefinite Quantity (IDIQ) contracts cover development, upgrade, production, retrofit, fielding, and sustainment efforts.

The program successfully completed Milestone (MS) C in February 2015 and is transitioning core program activities to the Operations and Support phase of the Defense Acquisition System over the next several years. Future required capabilities beyond the core Acquisition Category (ACAT) IC RQ-4 program will be completed as separate ACAT II and ACAT III modification programs.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305220F / *RQ-4 UAV*	**Project (Number/Name)** 675146 / *RQ-4 Block 40*

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305220F / *RQ-4 UAV*	Project (Number/Name) 675146 / *RQ-4 Block 40*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Global Hawk Engineering Manufacturing and Development	SS/ Various	Northrop Grumman Integrated Systems : San Diego, CA	139.073	0.139	Feb 2018	-		-		-		-	0.000	139.212	139.212
		Subtotal	139.073	0.139		-		-		-		-	0.000	139.212	N/A

Remarks

Target Value of the RQ-4 EMD, IDIQ, and EPIC contracts are not segregated by Budget Project Number.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Non-Prime Technical Support	Various	Various : Dayton, OH	1.369	-		-		-		-		-	0.000	1.369	1.369
		Subtotal	1.369	-		-		-		-		-	0.000	1.369	N/A

Remarks

Target Value of the Global Hawk effort is not segregated by Budget Project Number.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Flight Test & Evaluation	MIPR	412 TW : Edwards AFB, CA	23.231	-		-		-		-		-	0.000	23.231	23.231
		Subtotal	23.231	-		-		-		-		-	0.000	23.231	N/A

Remarks

Target Value of the Global Hawk effort is not segregated by Budget Project Number.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305220F / *RQ-4 UAV*	Project (Number/Name) 675146 / *RQ-4 Block 40*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMA: A&AS	Various	Various : Dayton, OH	7.040	-		-		-		-		-	0.000	7.040	7.040
PMA: Other Gov't Cost	Various	Various : Dayton, OH	3.412	-		-		-		-		-	0.000	3.412	3.412
		Subtotal	10.452	-		-		-		-		-	0.000	10.452	N/A

Remarks

Target Value of the Global Hawk effort is not segregated by Budget Project Number.

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	174.125	0.139		0.000		-		-		-	0.000	174.264	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305220F / *RQ-4 UAV*	**Project (Number/Name)** 675146 / *RQ-4 Block 40*

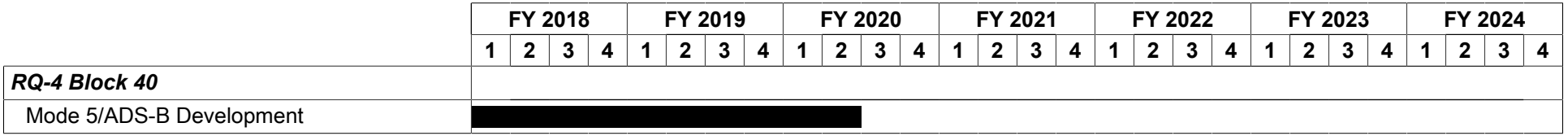

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305220F / *RQ-4 UAV*	**Project (Number/Name)** 675146 / *RQ-4 Block 40*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
RQ-4 Block 40				
Mode 5/ADS-B Development	1	2018	2	2020

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305220F / *RQ-4 UAV*	Project (Number/Name) 675149 / *RQ-4 Capability Enhancements*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675149: *RQ-4 Capability Enhancements*	0.000	188.242	195.740	160.472	0.000	160.472	215.762	191.414	138.900	30.342	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The RQ-4 Remotely Piloted Aircraft (RPA) provides a high altitude, deep look, long-endurance Intelligence, Surveillance, and Reconnaissance (ISR) capability that complements space and other airborne collectors during peacetime, crisis, and war-fighting scenarios. RDT&E funding in this project supports design, development, integration, and testing of capabilities needed to meet validated requirements for RQ-4 aircraft, including continuing aircraft system upgrade for current and alternate sensor payloads.

This funding also supports aircraft systems upgrades to include continuing airframe updates, aircraft operations surety, cybersecurity, airspace and interoperability enhancements, information assurance, and mission critical repair of Government Furnished Equipment (GFE). This project will include systems engineering/ program management, configuration and data management, test and evaluation, management services, Deficiency Report (DR)/Military Intelligence Program (MIP) Investigations, studies and analysis and fielding support for Block 30, Block 40, and Ground Segment/Communication Systems.

Activities include airspace and interoperability and communication enhancements and updates, periodic Operational Flight Program updates and releases, airframe and software upgrades, effort to bring early production aircraft to current operational configurations, deficiency report resolution across RQ-4 fleet, sensor enhancements and alternate sensor upgrades including the MS-177 and the Optical Bar Camera (OBC), ISR Payload Adapter, enhanced communications capabilities, support for demonstration and technology insertion, development and testing of ice protection system, enhanced mission flexibility to accommodate changes to mission objectives inflight, enhancements to support multi-domain contested environment operations, and studies and analysis supporting future system enhancements. Additionally, this project supports design, development, integration, and testing of items needed to meet validated requirements for Block 20/30/40 aircraft, including further development, mode creation, integration and test of the Multi-Platform Radar Technology Insertion Program (MP-RTIP) sensor capabilities, continued aircraft/communications systems upgrade, increased power generation, additional radar modes, reliability and maintainability improvements, Ground Segment Modernization Program (GSMP) and Communication System Modernization Program (CSMP) efforts, as well as next-generation communications capabilities. GSMP resolves fleet grounding Diminishing Manufacturing Sources (DMS) and obsolescence issues associated with ground segment equipment and provides critical warfighter capabilities such as building-based multi-aircraft control. It will also enhance interoperability data dissemination as well as provide training capability. CSMP resolves critical DMS and obsolescence issues in the RQ-4 communication infrastructure and provides enhancements across the RQ-4 communication network.

RDT&E funding in this project also supports design, development, integration and testing of the weapon system's legacy ground elements and communications capabilities to enhance functionality and maintain interoperability prior to GSMP/CSMP fielding. The ground segment currently includes the Mission Control Elements (MCE), the Launch and Recovery Elements (LRE), and the networking resources required to simultaneously disseminate intelligence information while remaining compliant with DoD cybersecurity network requirements to operate in the DoD Information Network (DoDIN).

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305220F / *RQ-4 UAV*	**Project (Number/Name)** 675149 / *RQ-4 Capability Enhancements*

This project supports system engineering/program management, test and evaluation, management services and fielding support for all RQ-4 projects. This reflects contracting/acquisition strategy for these common elements within the Global Hawk program to provide efficiencies.

The RQ-4 program will maintain and upgrade interoperability for Blocks 20/30/40 with system of systems partners and continue to incorporate applicable synergies with other platforms such as the U.S. Navy's Triton, other RPA weapon systems, and Processing, Exploitation & Dissemination (PED) elements. The networking capability for intelligence dissemination is required to provide the data transport interface between the Weapons System, Operations Centers, and external Intelligence Community customers.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver RQ-4 UAV weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

When judged feasible and affordable, this program will participate in the development, testing, and implementation of international standards to enhance joint, allied, and coalition interoperability. Studies and activities may be initiated to further explore the utility of incorporating the emerging architectural standards such as the USAF Unmanned Aerial Systems (UAS) Command and Control Initiative (UCI) or the DoD's Unmanned Control Segment standards (UCS) and Open Mission Systems (OMS). Ground Segment Modernization Program (GSMP) and Communication System Modernization Program (CSMP) will incorporate UCI and UCS standards.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: RQ-4 Capability Enhancements	52.218	6.170	31.000
Description: RQ-4 Development and Demonstration (includes development, system integration, software integration, development test, and fielding support for RQ-4 projects including Communication System Modernization Program (CSMP), reliability and maintainability (R&M), diminishing manufacturer sourcing (DMS) as well as studies and analysis supporting future system enhancements). Also supports RQ-4 development testing at the 412 Test Wing at Edwards AFB, CA and also includes funding for support from Air Force Operational Test and Evaluation Center (AFOTEC), Joint Interoperability Test Command (JITC), Distributed Common Ground System (DCGS), other interoperability partners and Other Government Costs (OGC). ***FY 2019 Plans:*** - Conduct risk reduction and analysis of ice protection solutions, continued system interoperability and upgrades, cybersecurity and information assurance and reliability & maintainability, and associated testing - Conduct Communication System Modernization Program (CSMP) pre-contract activities and establish as a formal program - Continue government test and non-prime engineering and technical support and OGC ***FY 2020 Plans:*** - Will conduct risk reduction and analysis of ice protection solutions, continued system interoperability and upgrades, cybersecurity and information assurance and reliability & maintainability, and associated testing - Will begin Communication System Modernization Program (CSMP) system design/development			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305220F / *RQ-4 UAV*	**Project (Number/Name)** 675149 / *RQ-4 Capability Enhancements*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Will continue government test and non-prime engineering and technical support and OGC ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding increased because in FY20 plan to award CSMP contract and begin development			
Title: Integrated Functional Capability 9 (IFC 9) ***Description:*** IFCs are periodic hardware and software capability, releases similar to an Operational Flight Program (OFP). IFC 9 provides, radar Software Development (RSD) 1.5, Nose Wheel Steering enhancement, in flight Waypoint Modification as well as numerous software enhancement and deficiency resolutions, and Other Government Costs (OGC). ***FY 2019 Plans:*** - Will award contract and begin system design/development ***FY 2020 Plans:*** - Will continue system design/development - Will continue government test and non-prime engineering and technical support and OGC ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A	0.000	19.300	17.850
Title: RQ-4 Ground Segment Modernization Program (GSMP) ***Description:*** GSMP resolves fleet grounding DMS and obsolescence issues associated with ground segment equipment and provides critical warfighter capabilities such as building-based multi-aircraft control. It will also enhance interoperability data dissemination as well as provide training capability. ***FY 2019 Plans:*** - Continue software development and system level testing of the GSMP - Continue development and hardware purchases for vendor SILs, DT and OT locations for the GSMP - Continue development technical publications, courseware and a trainer for the GSMP - Begin developmental test of GSMP ***FY 2020 Plans:*** - Will continue hardware purchase and installation for OT locations - Will continue development technical publications, courseware and a trainer for the GSMP - Will continue developmental test of GSMP ***FY 2019 to FY 2020 Increase/Decrease Statement:***	74.866	99.699	30.321

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305220F / *RQ-4 UAV*	**Project (Number/Name)** 675149 / *RQ-4 Capability Enhancements*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Funding decreased because in FY20 the major portion of software development is complete.			
Title: RQ-4 MS-177 Sensor Integration ***Description:*** Integration of MS-177 multispectral sensor into Block 30 ***FY 2019 Plans:*** - Continue the integration, and testing of MS-177 on Block 30, including additional spectral bands - Conduct MS-177 OT and attain Initial Operational Capability (IOC) - Continue development of MS-177A (10-Band) and integration ***FY 2020 Plans:*** - Will continue development testing and integration of MS-177A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A	53.158	34.922	34.054
Title: RQ-4 Infrastructure ***Description:*** RQ-4 Infrastructure includes system engineering, program management, test and evaluation, and fielding support for all RQ-4 projects as well as periodic Operational Flight Program (OFP) updates and releases, development testing, and Other Government Costs (OGC). This funding was previously included in the RQ-4 Capability Enhancements Accomplishment/Planned Program, including funding for the 412th TW at Edwards AFB, AFOTEC, JTIC DCGS and other interoperability partners. ***FY 2019 Plans:*** - Continue to develop OFP releases - Continue to perform government test and non-prime engineering and technical support and OGC - Continue to perform Contractor Flight Test supporting MS-177, GSMP, and other capabilities being developed ***FY 2020 Plans:*** - Will continue to develop OFP releases - Will perform government test and non-prime engineering and technical support and OGC - Will continue to perform Contractor Flight Test supporting MS-177, GSMP, and other capabilities being developed - Will conduct risk reduction and analysis of ice protection solutions, continued system interoperability and upgrades, cybersecurity and information assurance and reliability & maintainability, and associated testing ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding increased because of increased testing temp/requirements.	0.000	35.649	47.247
Accomplishments/Planned Programs Subtotals	180.242	195.740	160.472

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305220F / *RQ-4 UAV*	**Project (Number/Name)** 675149 / *RQ-4 Capability Enhancements*

	FY 2018	FY 2019
Congressional Add: RQ-4 Block 40 ISR Payload Adapter	8.000	0.000
FY 2018 Accomplishments: - Defined requirements and initiated acquisition planning documents for the ISR Payload Adapter on Block 40		
FY 2019 Plans: - Develop design and technical documentation for ISR Payload Adapter on Block 40 - Award contract for the ISR Payload Adapter on Block 40		
Congressional Adds Subtotals	8.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APAF 05 Line Item HAWK00: *RQ-4 Mods*	78.435	123.715	1.704	-	1.704	34.121	32.117	73.520	120.261	0.000	463.873
• APAF 07 Line Item RQ4DIS: *RQ-4 Post Production Support*	56.325	40.641	47.246	-	47.246	153.940	105.070	42.900	15.982	0.000	462.104

Remarks

D. Acquisition Strategy

The RQ-4 program uses an evolutionary acquisition strategy to provide the warfighter with a near-term combat capability with increased time-phased capability improvements as technology and risk achieve satisfactory levels. Northrop Grumman Corporation is the prime contractor. A suite of contract vehicles is used for development efforts: primarily, Indefinite Delivery, Indefinite Quantity (IDIQ) contracts cover development, system upgrade, production, retrofit, fielding, and sustainment efforts. MS-177 Sensor Enhancement RDT&E is being contracted directly with the Original Equipment Manufacturer (OEM), United Technology Corporation Aerospace Systems (UTAS).

The program successfully completed Milestone (MS) C in February 2015 and is transitioning core program activities to the Operations and Support phase of the Defense Acquisition System over the next several years. Future required capabilities beyond the core Acquisition Category (ACAT) IC RQ-4 program will be completed as separate ACAT II and ACAT III modification programs.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305220F / *RQ-4 UAV*	**Project (Number/Name)** 675149 / *RQ-4 Capability Enhancements*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
RQ-4 Capability Enhancements	SS/ Various	Northrop Grumman Integrated Systems : San Diego, CA	0.000	29.646	May 2018	-		31.000	Jun 2020	-		31.000	Continuing	Continuing	493.146
Integrated Functional Capability 9	SS/CPIF	Northrop Grumman Integrated Systems : San Diego, CA	0.000	-		19.300	Sep 2019	17.850	Apr 2020	-		17.850	Continuing	Continuing	150.001
RQ-4 Ground Segment Modernization Program (GSMP)	SS/CPIF	Northrop Grumman Integrated Systems : San Diego, CA	0.000	74.866	Oct 2017	99.699	Nov 2018	30.321	Dec 2019	-		30.321	Continuing	Continuing	301.439
RQ-4 MS-177 Sensor Integration	SS/ Various	Various : San Diego, CA	0.000	53.158	Aug 2018	34.922	Feb 2019	34.054	Jun 2020	-		34.054	Continuing	Continuing	272.886
RQ-4 Infrastructure	Various	Various : Various	0.000	-		32.812	May 2019	32.869	May 2020	-		32.869	Continuing	Continuing	319.143
RQ-4 Block 40 ISR Payload Adapter	SS/TBD	NGAS : San Diego, CA	0.000	8.000	Sep 2019	-		-		-		-	Continuing	Continuing	8.000
		Subtotal	0.000	165.670		186.733		146.094		-		146.094	Continuing	Continuing	N/A

Remarks

Target Value of the RQ-4 EMD, IDIQ, and EPIC Contracts is not segregated by Budget Project Number.
Target Value of GSMP contract includes $43.414M of funding in Budget Project Number 675147, RQ-4 Grnd Segment/Comm System
Target Value of MS-177 contract includes $121.332M of funding in Budget Project Number 675145, RQ-4 Block 30
Target Value of RQ-4 Infrastructure is not segregated by Budget Project Number.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Non Prime Technical Support	Various	Various : Dayton, OH	0.000	0.527	Oct 2018	1.290	Jan 2019	1.290	Jan 2020	-		1.290	Continuing	Continuing	-
		Subtotal	0.000	0.527		1.290		1.290		-		1.290	Continuing	Continuing	N/A

Remarks

Target Value of the RQ-4 effort is not segregated by Budget Project Number.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305220F / *RQ-4 UAV*	Project (Number/Name) 675149 / *RQ-4 Capability Enhancements*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Flight Test & Evaluation	MIPR	412 TW : Edwards AFB, CA	0.000	16.421	Jan 2018	5.280	Mar 2019	5.562	Nov 2019	-		5.562	Continuing	Continuing	-
		Subtotal	0.000	16.421		5.280		5.562		-		5.562	Continuing	Continuing	N/A

Remarks

Target Value of the RQ-4 effort is not segregated by Budget Project Number.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMA: A&AS	Various	Various : Dayton, OH	0.000	5.188	Nov 2017	1.184	Nov 2018	4.700	Nov 2019	-		4.700	Continuing	Continuing	-
PMA: Other Government Costs	Various	Varous : Dayton, OH	0.000	0.436	Oct 2017	1.253	Oct 2018	2.826	Oct 2019	-		2.826	Continuing	Continuing	-
		Subtotal	0.000	5.624		2.437		7.526		-		7.526	Continuing	Continuing	N/A

Remarks

Target Value of the RQ-4 effort is not segregated by Budget Project Number.

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	188.242		195.740		160.472		-		160.472	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305220F / *RQ-4 UAV*	**Project (Number/Name)** 675149 / *RQ-4 Capability Enhancements*

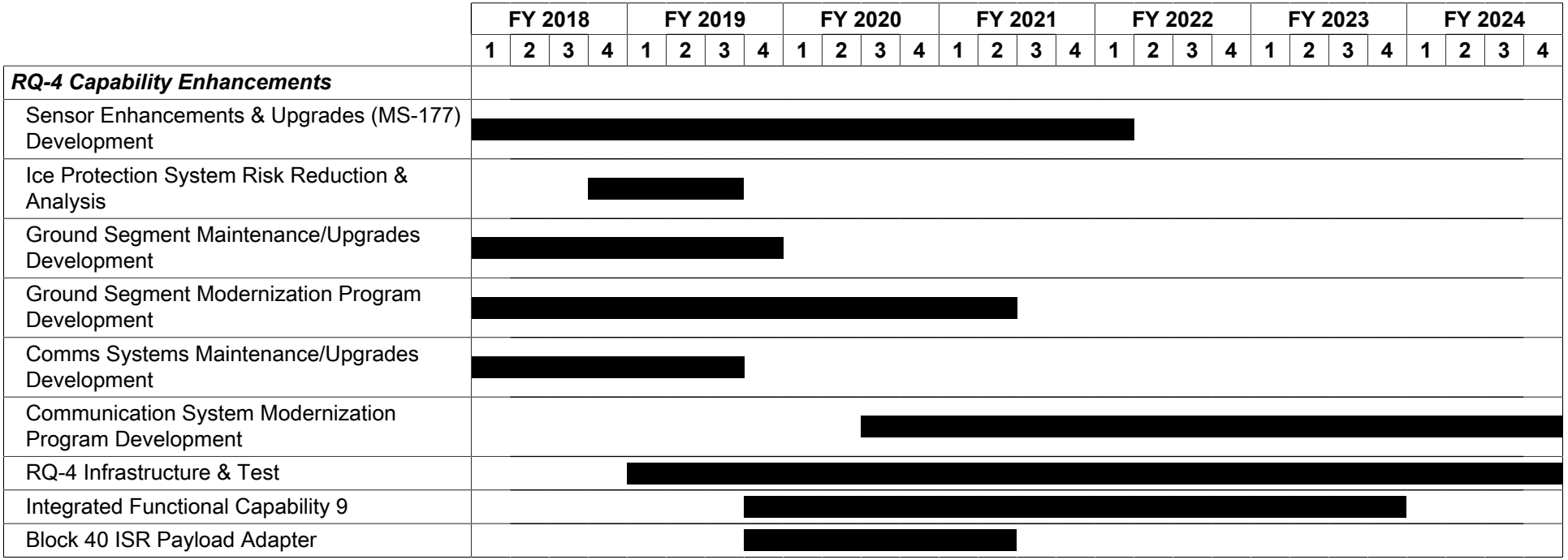

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305220F / *RQ-4 UAV*	**Project (Number/Name)** 675149 / *RQ-4 Capability Enhancements*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
RQ-4 Capability Enhancements				
Sensor Enhancements & Upgrades (MS-177) Development	1	2018	1	2022
Ice Protection System Risk Reduction & Analysis	4	2018	3	2019
Ground Segment Maintenance/Upgrades Development	1	2018	4	2019
Ground Segment Modernization Program Development	1	2018	2	2021
Comms Systems Maintenance/Upgrades Development	1	2018	3	2019
Communication System Modernization Program Development	3	2020	4	2024
RQ-4 Infrastructure & Test	1	2019	4	2024
Integrated Functional Capability 9	4	2019	4	2023
Block 40 ISR Payload Adapter	4	2019	2	2021

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305220F / *RQ-4 UAV*	Project (Number/Name) 67RTIP / *MP-RTIP*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
67RTIP: *MP-RTIP*	0.000	0.000	0.000	0.500	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.500
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 293

Note

Beginning in FY09, the Multi-Platform Radar Technology Insertion Program (MP-RTIP) funding was transferred to program 0305220F (RQ-4) Global Hawk (GH). Therefore, the data in this package includes only FY09 and subsequent funding related to program 0305220F.

A. Mission Description and Budget Item Justification

The MP-RTIP sensor was designed as a family of modular, scalable sensors to provide next generation capabilities to support sustainable network centric operations with integrated Command and Control, Intelligence, Surveillance and Reconnaissance (C2ISR) capability. MP-RTIP provides the RQ-4 Block 40 aircraft with advanced Synthetic Aperture Radar (SAR) and Moving Target Indicator (MTI) sensor capabilities.

This project (67RTIP) includes MP-RTIP modernization and integration efforts for the RQ-4 Block 40 Platform. MP-RTIP modernization studies and development insertion include the implementation of Maritime Modes (MM), Maritime Inverse SAR(MISAR), product improvements and other advanced capabilities. GH Program Office will continue integration of radar capabilities to include Maritime Modes integration into RQ-4 aircraft and ground systems.

Activities also include studies and analysis supporting current and future program planning and future modes development based on user requirements.

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

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Multi-Platform Radar Tech Insertion Program (MP-RTIP)	0.000	0.000	0.500
Description: MP-RTIP development and integration			
FY 2019 Plans: - Will complete transition to sustainment. GH Program Office will have responsibility for future radar development in the RQ-4 Capability Enhancements Program.			
FY 2020 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305220F / *RQ-4 UAV*	**Project (Number/Name)** 67RTIP / *MP-RTIP*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Funding will be utilized to complete close-out actions for Prime contract. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Wrap-up activities through FY19 and FY20; no funding required in FY19. FY20 funding is for contract close-out liabilities.			
Accomplishments/Planned Programs Subtotals	0.000	0.000	0.500

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APAF 05 Line Item HAWK00: *RQ-4 Mods*	78.435	123.715	1.704	-	1.704	34.121	32.117	73.520	120.261	0.000	463.873
• APAF 07 Line Item RQ4DIS: *RQ-4 Post Production Support*	56.325	40.641	47.246	-	47.246	153.940	105.070	42.900	15.982	0.000	462.104
• RDTE 07 PE 0305238F: *NATO AGS*	44.729	51.527	32.567	-	32.567	1.787	0.796	0.810	0.825	0.000	133.041

Remarks

D. Acquisition Strategy

- Will complete transition to sustainment and GH Program Office will have responsibility for future radar development including integration of RSD 1.5 and Maritime Mode software incorporated into Integrated Functional Capability (IFC) 9 plan.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305220F / *RQ-4 UAV*	Project (Number/Name) 67RTIP / *MP-RTIP*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MP-RTIP	SS/CPFF	Northrop Grumman Integrated Systems : El Segundo, CA	0.000	0.000		0.000		0.500		-		0.500	0.000	0.500	-
		Subtotal	0.000	0.000		0.000		0.500		-		0.500	0.000	0.500	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
IRT Study	Various	Various : Various, NV	0.000	-		-		-		-		-	0.000	0.000	-
Logistics Planning	SS/CPFF	Northrop Grumman Integrated Systems : El Segundo, CA	0.000	-		-		-		-		-	0.000	0.000	-
		Subtotal	0.000	-		-		-		-		-	0.000	0.000	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Flight Test & Evaluation	MIPR	Various : Various, NV	0.000	-		-		-		-		-	0.000	0.000	-
		Subtotal	0.000	-		-		-		-		-	0.000	0.000	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMA: A&AS	C/CPFF	Various : Various, NV	0.000	-		-		-		-		-	0.000	0.000	-
PMA: Other Gov't Cost	Various	Various : Boston, MA	0.000	-		-		-		-		-	0.000	0.000	-
		Subtotal	0.000	-		-		-		-		-	0.000	0.000	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305220F / *RQ-4 UAV*	Project (Number/Name) 67RTIP / *MP-RTIP*	

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		0.500		-		0.500	0.000	0.500	N/A

Remarks

Funds are required in FY20 to close out the entire MP-RTIP SDD contract #F19628-00-C-0100.

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305220F / *RQ-4 UAV*	**Project (Number/Name)** 67RTIP / *MP-RTIP*

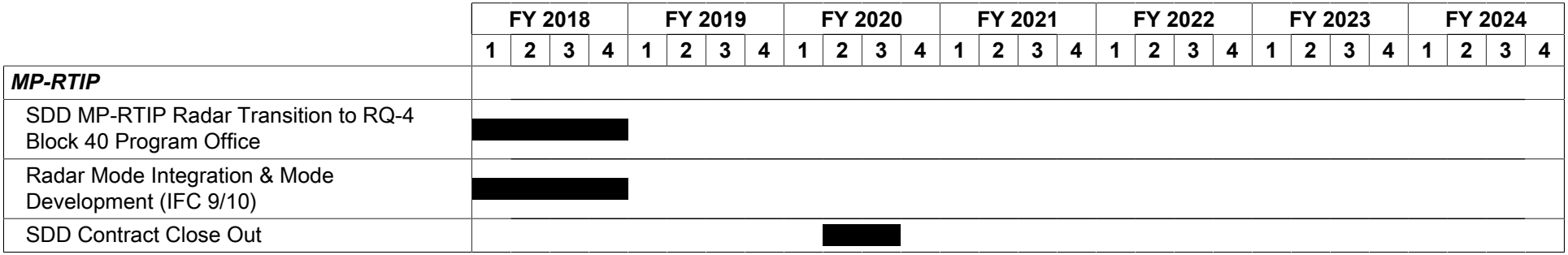

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305220F / *RQ-4 UAV*	**Project (Number/Name)** 67RTIP / *MP-RTIP*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
MP-RTIP				
SDD MP-RTIP Radar Transition to RQ-4 Block 40 Program Office	1	2018	4	2018
Radar Mode Integration & Mode Development (IFC 9/10)	1	2018	4	2018
SDD Contract Close Out	2	2020	3	2020

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305221F / *Network-Centric Collaborative Targeting*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	14.837	14.288	10.757	0.000	10.757	15.077	17.788	17.269	12.346	Continuing	Continuing
675197: *NCCT Core Technology*	-	12.290	14.288	10.757	0.000	10.757	15.077	17.788	17.269	12.346	Continuing	Continuing
675275: *SUTER*	-	2.547	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Note

In FY 2019, PE 0305221F, Network-Centric Collaborative Targeting, Project 675275, SUTER efforts were transferred to PE 0305208F, Distributed Common Ground/ Surface Systems, Project 674826, Common Imagery Ground/Surface Systems, in order to facilitate the development and integration of SUTER as a mission application on Open Architecture (OA) DCGS.

A. Mission Description and Budget Item Justification

Network Centric Collaborative Targeting (NCCT) is the Air Force program of record responsible for developing core technologies supporting the horizontal and/or vertical integration of Intelligence, Surveillance and Reconnaissance (ISR) sensor systems. The result of such integration is a multi-intelligence (multi-INT) sensor network. Operationally, NCCT core technologies provide a tactical collaborative multi-INT geolocation capability employed against high-value targets. NCCT software supports Machine-to-Machine (M2M) cross-cueing and Internet Protocol (IP) connectivity to coordinate collection activities across the NCCT network. NCCT correlation and fusion software ingests collection data to produce a single, composite track (geolocation and identification) in near real-time for high-value targets. SUTER supports development of sub nodal analysis tools. Operationally, such tools can be used to identify the nodes within an adversary's Command, Control, Communications, Computers, and Intelligence (C4I) network to engage or protect to achieve desired effects.

NCCT Core Technology includes, but is not limited to, network management software, a network messaging standard, correlation and fusion software, software supporting tactical-to-national Signals Intelligence (SIGINT) Concept of Operations (CONOPS), NCCT multi-level security hardware and software items and operator interfaces. Development funds support software modifications required for technology modernization specific to network and fusion architecture design, data fusion algorithms and cyber security, while keeping pace with evolving adversary tactics, techniques, and procedures (TTPs). FY 2020 funding will be dedicated to transitioning software development from Core Technology to a cloud architecture (v6.0) and fielding follow-on Core Technology Software versions as necessary.

SUTER develops concepts, TTPs and technologies for synchronizing the capabilities of ISR and non-kinetic capabilities in a coordinated fashion with traditional kinetic weapons to prosecute targets connected together or dependent upon some form of communications network. SUTER's planning, execution and assessment capability is implemented in a virtual architecture available to all Air Operations Centers (AOCs), taking advantage of the military value added from the synergies of Joint composite ISR, non-kinetic, and/or kinetic strike packages operating against networked target sets. This virtualized Service Oriented Architecture (SOA) utilizes software applications which employ M2M interfaces and IP communications to impact these target sets by attacking or influencing/shaping links, nodes or end points in the network to include: Radio Frequency and terrestrial links, switches, routers, hubs, servers, IP addresses, cell phones, antennas, radars, microwave relays, Satellite Communications (SATCOM) receivers, transceivers, etc. The three main pieces of the SUTER CONOPS include: first, the use of SUTER's sub-nodal analysis software to determine which nodes of the adversary's C4I network to engage or protect to achieve desired effects; second, the SUTER's distributed operations architecture to tie together relevant planning cells (e.g. AOCs, Joint Information Operations Warfare Center, etc.) so they can collaborate in developing and modeling the execution plan(s)

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305221F / *Network-Centric Collaborative Targeting*

needed to disrupt or monitor the required network aim-points; and third, via SUTER's combined network Graphical User Interface, all involved players monitor the plan's execution, provide Near-Real Time (NRT) updates to the status of on-going activities, provide continuous assessment/updates of the execution of the plan, and, within authorities (Rules of Engagement), re-direct activities based on changing battlefield conditions.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver NCCT and SUTER capability.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	18.842	14.288	14.752	0.000	14.752
Current President's Budget	14.837	14.288	10.757	0.000	10.757
Total Adjustments	-4.005	0.000	-3.995	0.000	-3.995
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-4.005	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	-3.995	0.000	-3.995

Change Summary Explanation

FY 2018 -$4.005M reprogramming

FY 2020 -$3.995M reprogramming

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305221F / *Network-Centric Collaborative Targeting*	Project (Number/Name) 675197 / *NCCT Core Technology*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675197: *NCCT Core Technology*	-	12.290	14.288	10.757	0.000	10.757	15.077	17.788	17.269	12.346	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Network Centric Collaborative Targeting (NCCT) is the Air Force program of record responsible for developing core technologies supporting the horizontal and/or vertical integration of Intelligence, Surveillance and Reconnaissance (ISR) sensor systems. The result of such integration is a multi-intelligence (multi-INT) sensor network. Operationally, NCCT core technologies provide a tactical collaborative multi-INT geolocation capability employed against high-value targets. NCCT software supports Machine-to-Machine (M2M) cross-cueing and Internet Protocol (IP) connectivity to coordinate collection activities across the NCCT network. NCCT correlation and fusion software ingests collection data to produce a single, composite track (geolocation and identification) in near real-time for high-value targets.

NCCT Core Technology includes, but is not limited to, network management software, a network messaging standard, correlation and fusion software, software supporting tactical-to-national (SIGINT) CONOPS, NCCT multi-level security hardware and software items, and operator interfaces. Development funds support software modifications required for technology modernization specific to network and fusion architecture design, data fusion algorithms, and cyber security, while keeping pace with evolving adversary tactics, techniques, and procedures (TTPs). FY 2020 funding will be dedicated to transitioning software development from Core Technology to a cloud architecture (v6.0) and fielding follow-on Core Technology Software versions as necessary.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Core Technology	12.290	14.288	10.757	0.000	10.757
Description: Accomplishments and planned efforts include development and update of Network-Centric Collaborative Targeting (NCCT) Core Technology; technical support to users, and management activities					
FY 2019 Plans: - Resolves critical & high software vulnerabilities for fielding of NCCT v5.2 and obtains Authority to Operate (ATO) to replace ATOs currently supporting the fielded system.					
FY 2020 Base Plans: - Will transition software development of Core Technology to a cloud architecture (v6.0) and fielding follow-on Core Technology Software versions as necessary.					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305221F / *Network-Centric Collaborative Targeting*	**Project (Number/Name)** 675197 / *NCCT Core Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
- Will expand NCCT capabilities to ingest emergent national and tactical level multi-INT sensor data such as expanded Airborne Overhead Cooperative Operations (AOCO) standards and platform sensor data that will enrich and improve current fusion and dissemination of data to the tactical edge. ***FY 2020 OCO Plans:*** None. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decreased due to reprogramming efforts that supported higher Air Force priorities.					
Accomplishments/Planned Programs Subtotals	12.290	14.288	10.757	0.000	10.757

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPAF 03 Line Item 832070: *Intelligence Comm Equipment*	3.312	3.095	3.148	-	3.148	3.207	3.264	3.322	3.382	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Network-Centric Collaborative Targeting (NCCT) Core Technology capabilities are developed, maintained and sustained with baseline/incremental upgrades plus any Quick Reaction Capability (QRC) developments acquired through the 645th Aeronautical System Group (645 AESG) in accordance with their Program Management Directive (PMD), Class Justification and Approval (J&A), and Life Cycle Management Plan (LCMP) across the full spectrum of system life cycle management ("cradle to grave" support concept). Due to the rapidly changing threat environment encountered during our prolonged commitment to Overseas Contingency Operations (OCO), the acquisition program manager has the authority to redirect funding as necessary to meet current stated and emerging/evolving Combatant Commander requirements.

645 AESG, Wright Patterson AFB OH, manages the Cost Plus Fixed Fee (CPFF) contracts used to develop NCCT Core Technology. 645 AESG will develop NCCT Core Technology software on common hardware for systems and platforms designated to field this ISR capability. Individual platform program management offices may contract directly with their prime contractors or through the 645 AESG for integration of NCCT capabilities on their respective systems and platforms.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305221F / *Network-Centric Collaborative Targeting*	**Project (Number/Name)** 675197 / *NCCT Core Technology*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Core Technology Development A	SS/CPFF	L-3 ComCept : Rockwall, TX	-	4.830	Nov 2017	7.388	Jan 2019	-		-		-	Continuing	Continuing	-
Core Technology Development B	SS/CPFF	L-3 ComCept : Rockwall, TX	-	6.413	Jul 2018	6.300	Jan 2019	9.857	Jan 2020	-		9.857	Continuing	Continuing	-
		Subtotal	-	11.243		13.688		9.857		-		9.857	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Security Certification/ Technical Engineering	SS/CPFF	L-3 ComCept : Rockwall, TX	-	0.500	Mar 2018	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	0.500		-		-		-		-	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMA	Allot	645 AESG : Dayton, OH	-	0.547	Mar 2018	0.600	Mar 2019	0.900	Mar 2020	-		0.900	Continuing	Continuing	-
		Subtotal	-	0.547		0.600		0.900		-		0.900	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	12.290		14.288		10.757		-		10.757	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305221F / *Network-Centric Collaborative Targeting*	**Project (Number/Name)** 675197 / *NCCT Core Technology*

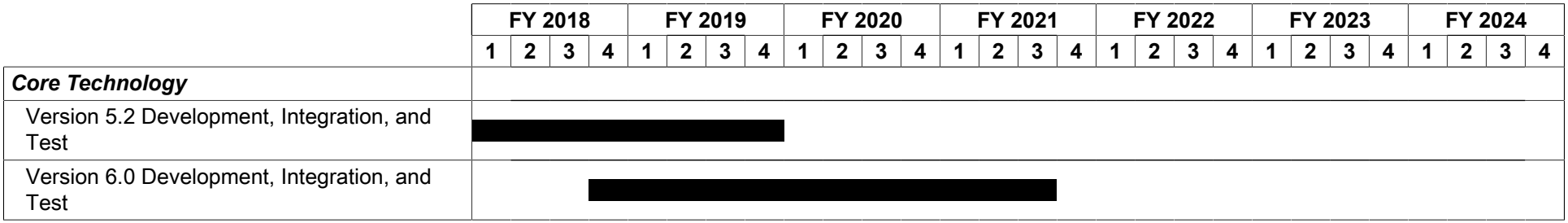

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305221F / *Network-Centric Collaborative Targeting*	**Project (Number/Name)** 675197 / *NCCT Core Technology*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Core Technology				
Version 5.2 Development, Integration, and Test	1	2018	4	2019
Version 6.0 Development, Integration, and Test	4	2018	3	2021

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305221F / *Network-Centric Collaborative Targeting*	Project (Number/Name) 675275 / *SUTER*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675275: *SUTER*	-	2.547	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2019, PE 0305221F, Network-Centric Collaborative Targeting, Project 675275, SUTER efforts were transferred to PE 0305208F, Distributed Common Ground/ Surface Systems, Project 674826, Common Imagery Ground/Surface Systems, in order to facilitate the development and integration of SUTER as a mission application on Open Architecture (OA) DCGS.

A. Mission Description and Budget Item Justification

SUTER develops concepts, TTPs and technologies for synchronizing the capabilities of ISR and non-kinetic capabilities in a coordinated fashion with traditional kinetic weapons to prosecute targets connected together or dependent upon some form of communications network. SUTER's planning, execution and assessment capability is implemented in a virtual architecture available to all Air Operations Centers (AOCs), taking advantage of the military value added from the synergies of Joint composite ISR, non-kinetic, and/or kinetic strike packages operating against networked target sets. This virtualized Service Oriented Architecture (SOA) utilizes software applications which employ M2M interfaces and IP communications to impact these target sets by attacking or influencing/shaping links, nodes or end points in the network to include: Radio Frequency and terrestrial links, switches, routers, hubs, servers, IP addresses, cell phones, antennas, radars, microwave relays, Satellite Communications (SATCOM) receivers, transceivers, etc. The three main pieces of the SUTER CONOPS include: first, the use of SUTER's sub-nodal analysis software to determine which nodes of the adversary's C4I network to engage or protect to achieve desired effects; second, the SUTER's distributed operations architecture to tie together relevant planning cells (e.g. AOCs, Joint Information Operations Warfare Center, etc.) so they can collaborate in developing and modeling the execution plan(s) needed to disrupt or monitor the required network aim-points; and third, via SUTER's combined network Graphical User Interface, all involved players monitor the plan's execution, provide Near-Real Time (NRT) updates to the status of on-going activities, provide continuous assessment/updates of the execution of the plan, and, within authorities (Rules of Engagement), re-direct activities based on changing battlefield conditions.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: SUTER Software Development	2.547	0.000	0.000	-	0.000
Description: Efforts include development and release of SUTER software upgrade.					
FY 2019 Plans: None. SUTER transitioning to PE 0305208F, Distributed Common Ground/Surface Systems, Project 674826, Common Imagery Ground/Surface Systems. No money is laid in for FY 2019 and beyond.					
FY 2020 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305221F / *Network-Centric Collaborative Targeting*	**Project (Number/Name)** 675275 / *SUTER*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
N/A					
Accomplishments/Planned Programs Subtotals	2.547	0.000	0.000	-	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Prior to FY 2017, SUTER capabilities were developed, maintained and sustained with baseline/incremental upgrades plus any Quick Reaction Capability (QRC) developments acquired through the 645 AESG. In FY 2017, due to software limitations and a lack of technical maturity of SUTER's capabilities, the Air Force decided not to proceed with the 645 AESG technical plan on SUTER and transitioned SUTER program execution responsibilities to the Air Force Research Laboratory (AFRL). AFRL is increasing the technical maturity of the SUTER software and capabilities to a level suitable for operational capability and for transition to PE 0305208F, Distributed Common Ground/Surface Systems, Project 674826, Common Imagery Ground/Surface Systems. This transition will be made in order to facilitate the development and integration of SUTER as a mission application on Open Architecture (OA) DCGS.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305221F / *Network-Centric Collaborative Targeting*	Project (Number/Name) 675275 / *SUTER*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SUTER Technology Development and Maturation	SS/CPFF	Northrop Grumman : Bellevue, NY	-	1.036	Jun 2018	-		-		-		-	Continuing	Continuing	-
SUTER Technology Development	SS/CPAF	Booze Allen : McLean, VA	-	1.036	Jul 2018	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	2.072		-		-		-		-	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SUTER Technical Support	SS/CPFF	BAE Systems Info Solution : McLean, VA	-	0.475	Jun 2018	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	0.475		-		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	2.547		0.000		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305221F / *Network-Centric Collaborative Targeting*	**Project (Number/Name)** 675275 / *SUTER*

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
SUTER																												
SUTER Technology Development and Maturation																												

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305221F / *Network-Centric Collaborative Targeting*	**Project (Number/Name)** 675275 / *SUTER*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
SUTER				
SUTER Technology Development and Maturation	1	2018	2	2019

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305238F / *NATO AGS*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	44.729	51.527	32.567	0.000	32.567	1.787	0.796	0.810	0.825	Continuing	Continuing
676001: *NATO AGS*	-	44.729	51.527	32.567	0.000	32.567	1.787	0.796	0.810	0.825	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program funds the U.S. contribution to the Alliance Ground Surveillance (AGS) system, a North Atlantic Treaty Organization (NATO), Direct Commercial Sale acquisition. AGS is an airborne ground surveillance capability that provides continuous, wide area surveillance in all weather conditions. It will provide NATO decision makers with near real time information and situational awareness concerning friendly, neutral and opposing ground and maritime forces to support mission planning and execution, including force protection and targeting. All NATO nations will have access to AGS collection data, creating opportunities for burden sharing with similar U.S. assets.

The AGS program includes: air and ground segment acquisitions, operations of the NATO AGS Management Agency (NAGSMA), development of operations and support definition and establishment of an initial support capability. The air segment consists of five (5) air vehicles based on unique exportable configurations of the United States Air Force Global Hawk air frame, Navy Triton command and control architecture and the U.S. Multi-Platform Radar Technology Insertion Program (MP-RTIP) radar. The U.S. will also integrate new Maritime Moving Target and Inverse Synthetic Aperture Radar capability into the MP-RTIP radar for NATO AGS. The ground segment consists of fixed site and transportable/mobile ground stations for air vehicle Command and Control (C2), data exploitation and distribution. Operations and continuing In-Service Support will be funded through a future NATO Military Commanders' Capability Package funded within the NATO Security Investment Program (NSIP).

U.S. participation in NATO AGS was ratified by Secretary of Defense (SECDEF) signature/approval of the NATO AGS Program Memorandum of Understanding (PMOU) in June 2009 and includes 15 nations. In FY 2012, OSD transferred the NATO AGS program to the U.S. Air Force (USAF) for management and execution of the Research and Development effort.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305238F / *NATO AGS*

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	44.729	51.527	32.567	0.000	32.567
Current President's Budget	44.729	51.527	32.567	0.000	32.567
Total Adjustments	0.000	0.000	0.000	0.000	0.000
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

Change Summary Explanation

Funding increased due to MP-RTIP system development, integration, initial testing efforts and inflation.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Design / Development of NATO Alliance Ground Surveillance (AGS)	10.160	5.848	5.848
Description: U.S. contribution to NATO for AGS development acquisition and initial fielding. Supports configuration changes at a system level and air vehicle exportability modifications. ***FY 2019 Plans:*** - Aircraft #1-5 will be delivered to NATO ***FY 2020 Plans:*** -Completing production/development and integration ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A			
Title: Design/Development of Maritime Modes	32.723	43.663	24.682
Description: Supports development and flight testing of maritime modes capability for RTIP and additional configuration changes that cannot be performed under the direct commercial sale contract between Northrop Grumman and NAGSMA. ***FY 2019 Plans:***			

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305238F / *NATO AGS*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Will continue development of maritime modes capability and additional configuration changes that cannot be performed under the direct commercial sale contract between Northrop Grumman and NAGSMA ***FY 2020 Plans:*** - Will continue development of maritime modes capability and additional configuration changes that cannot be performed under the direct commercial sale contract between Northrop Grumman and NAGSMA ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding decreased due to progress made in MP-RTIP system development, integration, and initial testing efforts.			
Title: Technical Support for NATO Alliance Ground Surveillance (AGS) ***Description:*** Provide engineering and logistics support for NATO AGS development and initial fielding. ***FY 2019 Plans:*** - Will continue engineering, logistics and program office support for NATO AGS development and initial fielding. ***FY 2020 Plans:*** - Will continue engineering, logistics and program office support for NATO AGS development and initial fielding. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding increased due to inflation and preparations to receive aircraft.	0.784	0.981	1.002
Title: Test and Evaluation Support for NATO Alliance Ground Surveillance (AGS) ***Description:*** Provide testing and evaluation via the Air Force Test Center. ***FY 2019 Plans:*** - Continue flight testing on the aircraft ***FY 2020 Plans:*** - Continues flight test support ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A	1.062	1.035	1.035
Accomplishments/Planned Programs Subtotals	44.729	51.527	32.567

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305238F / *NATO AGS*

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• RDTE 07 PE 0305220F: *RQ-4 UAV*	222.693	221.690	191.733	-	191.733	243.252	-	-	-	Continuing	Continuing

Remarks

E. Acquisition Strategy

Acquisition of the AGS system is being accomplished via a single delivery strategy. The system will be delivered via a fixed price direct commercial sale contract between Northrop Grumman Integrated System Sector International, Incorporated (NGISSII) & NATO, which was signed on 20 May 2012. The program is managed by the NATO AGS Management Agency (NAGSMA).

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305238F / *NATO AGS*	Project (Number/Name) 676001 / *NATO AGS*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NATO AGS Design / Development	SS/FFP	NATO AGS Management Agency : Brussels, Belgium	-	10.160	Oct 2017	5.848	Oct 2018	5.848	Oct 2019	-		5.848	Continuing	Continuing	-
MP-RTIP for NATO AGS Design / Development	SS/FFP	AFLCMC/HB : Hanscom AFB, MA	-	32.723	Dec 2017	43.663	Dec 2018	24.682	Dec 2019	-		24.682	Continuing	Continuing	-
		Subtotal	-	42.883		49.511		30.530		-		30.530	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NATO AGS Technical Support	SS/FFP	Multiple : Hanscom, WPAFB, OH	-	0.213	Dec 2017	0.300	Oct 2018	0.300	Dec 2019	-		0.300	Continuing	Continuing	-
		Subtotal	-	0.213		0.300		0.300		-		0.300	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NATO AGS Test and Evaluation Support	SS/FFP	Multiple: AFLCMC/WI, AFLCMC/HB, 412 TW, 88 CG : Hanscom, WPAFB, Edwards	-	1.062	May 2018	1.035	Oct 2018	1.035	Oct 2019	-		1.035	Continuing	Continuing	-
		Subtotal	-	1.062		1.035		1.035		-		1.035	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NATO AGS Management Services	SS/FFP	Multiple : Hanscom, WPAFB, Pax River	-	0.571	Jan 2018	0.681	Jan 2019	0.702	Oct 2019	-		0.702	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305238F / *NATO AGS*	Project (Number/Name) 676001 / *NATO AGS*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	0.571		0.681		0.702		-		0.702	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	44.729		51.527		32.567		-		32.567	Continuing	Continuing	N/A

Remarks

The Industrial Structure consists of Northrop Grumman (Northrop Grumman Integrated Systems Sector International, Incorporated - NGISSII) prime contractor, three subcontractors, and 15 participating nation industries that will receive direct work. There are no indirect offsets. The technical support of the NATO AGS program includes Advisory & Assistance Services to NATO. The test and evaluation support of the NATO AGS program includes the AFMC 412 Test Wing support of Flight Testing and Frequency Management by the AFMC 88 Communication Group. The management services support of the NATO AGS program includes MITRE Engineering, U.S. Navy's Triton program office support, U.S. government travel, and supplies.

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305238F / *NATO AGS*	**Project (Number/Name)** 676001 / *NATO AGS*

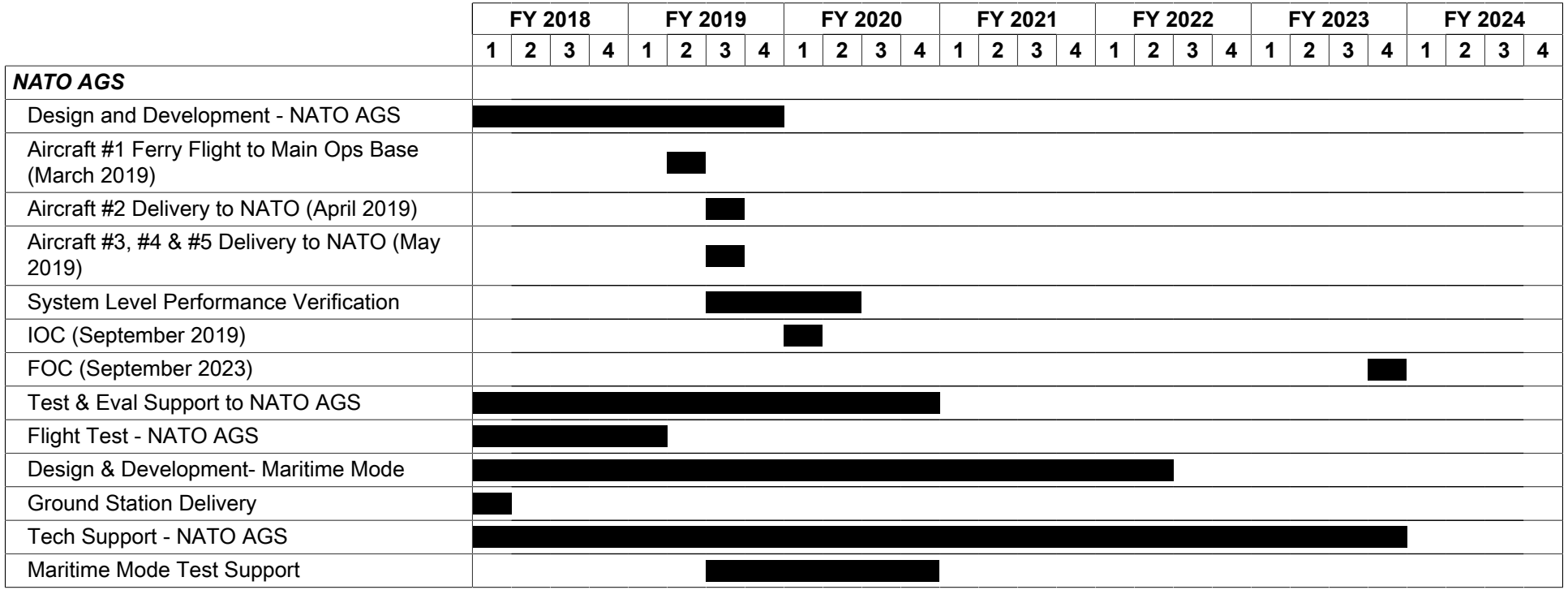

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305238F / *NATO AGS*	**Project (Number/Name)** 676001 / *NATO AGS*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
NATO AGS				
Design and Development - NATO AGS	1	2018	4	2019
Aircraft #1 Ferry Flight to Main Ops Base (March 2019)	2	2019	2	2019
Aircraft #2 Delivery to NATO (April 2019)	3	2019	3	2019
Aircraft #3, #4 & #5 Delivery to NATO (May 2019)	3	2019	3	2019
System Level Performance Verification	3	2019	2	2020
IOC (September 2019)	1	2020	1	2020
FOC (September 2023)	4	2023	4	2023
Test & Eval Support to NATO AGS	1	2018	4	2020
Flight Test - NATO AGS	1	2018	1	2019
Design & Development- Maritime Mode	1	2018	2	2022
Ground Station Delivery	1	2018	1	2018
Tech Support - NATO AGS	1	2018	4	2023
Maritime Mode Test Support	3	2019	4	2020

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305240F / *Support to DCGS Enterprise*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	26.349	26.579	37.774	0.000	37.774	50.844	28.117	28.630	29.146	Continuing	Continuing
674826: *Common Imagery Ground / Surface Systems*	-	14.969	15.100	15.382	0.000	15.382	15.649	15.974	16.266	16.559	Continuing	Continuing
675265: *Common Imagery Processor (CIP)*	-	11.380	11.479	22.392	0.000	22.392	35.195	12.143	12.364	12.587	Continuing	Continuing

A. Mission Description and Budget Item Justification

This Program Element funds 1) the Intelligence Integration Office (I2O), formerly the Distributed Common Ground System (DCGS) Multi-service Execution Team (MET) Office (DMO), which oversees the DCGS Integration Backbone (DIB) development, modernization, integration, test, and community support in support of Defense Intelligence Information Enterprise (DI2E), Combatant Commands and Coalition/Partner Intel Operations and 2) the DCGS Enterprise Interoperability effort and 3) the Imagery Processing effort which consists of the Virtual Imagery Processing Capability (VIP-C) program.

1)The I2O oversees Enterprise Interoperability for Defense Intelligence Information Enterprise (DI2E), Combatant Commands and Coalition/Partner Intel Operations. All Services must pursue a common path based on a set of common enterprise services consistent with the DoD's net-centric vision. The DoD charged the Air Force to lead the development, modernization, integration, test, and community support of the Enterprise services to include implementation of international standards(including NATO standardization agreements) to ensure joint, allied, and coalition interoperability. The DIB is a set of enterprise standards and services that enable interoperability and component reuse and provide a flexible and singularly sustainable path to information sharing across the global ISR enterprise. The follow-on effort, Next Generation Interoperability (NGI), will deliver and maintain modernized federation profiles, interfaces, methodologies, and data interchange standards without relying upon legacy DIB federation standards and dependencies through common language, common mechanisms, and quality exposure. The deployment of these services into the DI2E Common Data Fabric (CDF) will provide common applications and a managed service framework for the development, test and integration of machine-aided decision making capabilities. The I2O manages the DCGS Test Laboratory (DTL) at Hanscom AFB. This facility supports software development and test for DI2E evaluation during exercises such as Enterprise Challenge and Storm Force.

2) The DCGS Enterprise Interoperability effort provides support to OUSD(I), AF DCGS and NATO interoperability efforts. This includes the development, testing, and implementation of international standards (to include NATO standardization agreements) to ensure joint, allied, and coalition interoperability.

3) The Imagery Processing effort develops the Virtual Imagery Processing Capability (VIP-C) within the DCGS architecture. The VIP-C provides end-to-end image processing to include raw data ingest, data format standardization to facilitate exploitation, secondary image processing, metadata conditioning, and image quality enhancements. Current efforts are focused on 1) ensuring new sensors being fielded and associated data types can be processed and 2) increasing investment in the Machine Assisted Geospatial Intelligence (GEOINT) Exploitation (MAGE) capability.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305240F / *Support to DCGS Enterprise*

This program element may include necessary civilian pay expenses required to manage, execute, and deliver AF DCGS weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605833, and 0605898F.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	26.349	26.579	27.074	0.000	27.074
Current President's Budget	26.349	26.579	37.774	0.000	37.774
Total Adjustments	0.000	0.000	10.700	0.000	10.700
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	10.700	0.000	10.700

Change Summary Explanation

In FY 2020, the Air Force programmed an additional $10.7M in RDT&E funding to increase investment in the Machine Assisted Geospatial Intelligence (GEOINT) Exploitation (MAGE) capability.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305240F / *Support to DCGS Enterprise*	Project (Number/Name) 674826 / *Common Imagery Ground / Surface Systems*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
674826: *Common Imagery Ground / Surface Systems*	-	14.969	15.100	15.382	0.000	15.382	15.649	15.974	16.266	16.559	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Program Element funds the Intelligence Integration Office (I2O), formerly the Distributed Common Ground System (DCGS) Multi-service Execution Team (MET) Office (DMO), which oversees the DCGS Integration Backbone (DIB) development, modernization, integration, test, and community support in support of Defense Intelligence Information Enterprise (DI2E), Combatant Commands and Coalition/Partner Intel Operations.

The I2O oversees Enterprise Interoperability for Defense Intelligence Information Enterprise (DI2E), Combatant Commands and Coalition/Partner Intel Operations. All Services must pursue a common path based on a set of common enterprise services consistent with the DoD's net-centric vision. The DoD charged the Air Force to lead the development, modernization, integration, test, and community support of the Enterprise services to include implementation of international standards (including NATO standardization agreements) to ensure joint, allied, and coalition interoperability. The DIB is a set of enterprise standards and services that enable interoperability and component reuse and provide a flexible and singularly sustainable path to information sharing across the global ISR enterprise. The follow-on effort, Next Generation Interoperability (NGI), will deliver and maintain modernized federation profiles, interfaces, methodologies, and data interchange standards without relying upon legacy DIB federation standards and dependencies through common language, common mechanisms, and quality exposure. The deployment of these services into the DI2E Common Data Fabric (CDF) will provide common applications and a managed service framework for the development, test and integration of machine-aided decision making capabilities. The I2O manages the DCGS Test Laboratory (DTL) at Hanscom AFB. This facility supports software development and test for DI2E evaluation during exercises such as Enterprise Challenge and Storm Force.

The funding also provides support to OUSD(I), AF DCGS and NATO interoperability efforts. This includes the development, testing, and implementation of international standards (to include NATO standardization agreements) to ensure joint, allied, and coalition interoperability.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Distributed Common Ground / Surface System (DCGS) Integration Backbone and Test/Community Support for the DCGS Enterprise	12.729	12.933	13.075
Description: Develop, modernize, integrate, test and manage the DIB and provide test/community support to the DCGS enterprise.			
FY 2019 Plans: - Implement non-destructive DIB upgrades to reduce integration burden and increase quantity of upgraded nodes among services - Establish, implement and deploy standards and capabilities for Next Generation Interoperability (NGI)			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305240F / *Support to DCGS Enterprise*	**Project (Number/Name)** 674826 / *Common Imagery Ground / Surface Systems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Demonstrate Enterprise Hub Node concept with Enterprise Dashboard during Enterprise Challenge 19 Spirals and Main Exercise ***FY 2020 Plans:*** - Will complete migration to cloud-native deployment and implement Enterprise Hub Node for operational use - Will continue to implement and deploy NGI capabilities and prove out concepts during Enterprise Challenge 20 Spirals and Main Exercise - Will leverage an Object Based Production strategy and utilize machine learning to enhance explicit Content, Discovery and Retrieval (CD&R). ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding increase due to adjustment for inflation			
Title: DCGS Enterprise Interoperability ***Description:*** Provide support to OUSD(I), AF DCGS and NATO Interoperability Enterprise efforts. ***FY 2019 Plans:*** Continue to support to OUSD(I), AF DCGS and NATO Interoperability Enterprise efforts. ***FY 2020 Plans:*** Will continue to support to OUSD(I), AF DCGS and NATO Interoperability Enterprise efforts. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding increase due to adjustment for inflation	2.240	2.167	2.307
Accomplishments/Planned Programs Subtotals	14.969	15.100	15.382

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Air Force uses an evolutionary acquisition approach with version releases and periodic upgrades to develop, field, and upgrade the capabilities. The Air Force structures contracts to provide the improved capabilities through full and open competition to the maximum extent possible. For management, the Air Force leads the Intelligence Integration Office (I2O) which coordinates the Multi-Service requirements for the DIB and modern enterprise services in support of USD(I) direction.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305240F / *Support to DCGS Enterprise*	**Project (Number/Name)** 674826 / *Common Imagery Ground / Surface Systems*

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305240F / *Support to DCGS Enterprise*	Project (Number/Name) 674826 / *Common Imagery Ground / Surface Systems*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DIB Modernization, Integration, DT and Interoperability	C/T&M	Various : Various	-	5.586	Jan 2018	8.500	Jan 2019	8.600	Jan 2020	-		8.600	Continuing	Continuing	-
DCGS Test and Community Support	C/CPAF	Various : Various	-	5.638	Jun 2018	0.000		0.000		-		0.000	Continuing	Continuing	-
		Subtotal	-	11.224		8.500		8.600		-		8.600	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DCGS Enterprise Interoperability	C/Various	Various : Various	-	2.247	Apr 2018	2.167	Apr 2019	2.307	Apr 2020	-		2.307	Continuing	Continuing	-
		Subtotal	-	2.247		2.167		2.307		-		2.307	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FFRDC	C/CPFF	Various : Bedford, MA	-	0.430	Apr 2018	0.351	Apr 2019	0.351	Apr 2020	-		0.351	Continuing	Continuing	-
A&AS	C/CPAF	Various : Various	-	1.068	Feb 2018	4.082	Feb 2019	4.124	Feb 2020	-		4.124	Continuing	Continuing	-
		Subtotal	-	1.498		4.433		4.475		-		4.475	Continuing	Continuing	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	14.969		15.100		15.382		-		15.382	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305240F / *Support to DCGS Enterprise*	**Project (Number/Name)** 674826 / *Common Imagery Ground / Surface Systems*

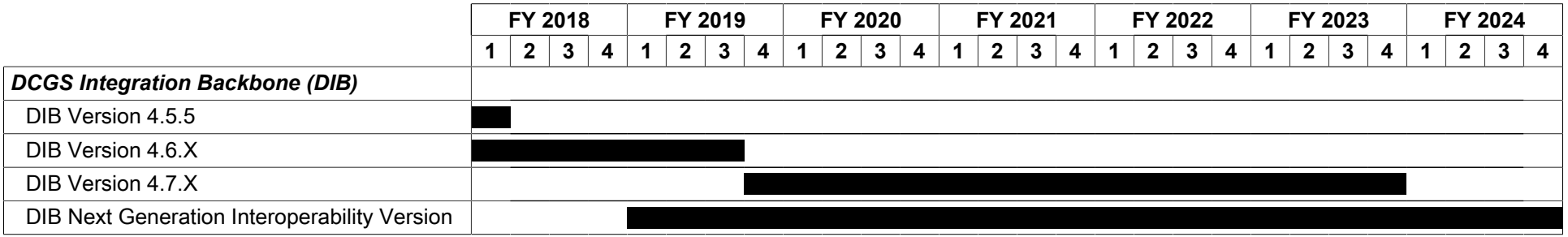

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305240F / *Support to DCGS Enterprise*	**Project (Number/Name)** 674826 / *Common Imagery Ground / Surface Systems*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
DCGS Integration Backbone (DIB)				
DIB Version 4.5.5	1	2018	1	2018
DIB Version 4.6.X	1	2018	3	2019
DIB Version 4.7.X	4	2019	4	2023
DIB Next Generation Interoperability Version	1	2019	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305240F / *Support to DCGS Enterprise*	Project (Number/Name) 675265 / *Common Imagery Processor (CIP)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675265: *Common Imagery Processor (CIP)*	-	11.380	11.479	22.392	0.000	22.392	35.195	12.143	12.364	12.587	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Imagery Processing effort develops the Virtual Imagery Processing Capability (VIP-C) within the DCGS architecture. VIP-C accepts airborne imagery data, processes it into an exploitable format, and provides it to other elements within the weapon system and/or the DCGS Enterprise. Current efforts include further developing the virtual software capability to improve processing across the enterprise and testing, development, and demonstrations integrating updated and new/ emerging sensors into DCGS. In addition, the project involves increasing investment in the Machine Assisted Geospatial Intelligence (GEOINT) Exploitation (MAGE) capability.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Imagery Processor	11.380	11.479	22.392
Description: Continue developing VIP-C to keep pace with growing sensor baseline and enhance imagery data quality. ***FY 2019 Plans:*** - Continue to upgrade and improve VIP-C to enable better geo-coordinate accuracy, facilitate automated intelligence discovery and integrate new algorithms. ***FY 2020 Plans:*** - Will continue to upgrade and improve VIP-C to enable better geo-coordinate accuracy, facilitate automated intelligence discovery and integrate new algorithms. This includes increasing investment in the MAGE capability. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding increase for MAGE requirements			
Accomplishments/Planned Programs Subtotals	11.380	11.479	22.392

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPAF 04 Line Item 846080: *DCGS-AF*	30.636	23.520	21.918	-	21.918	22.320	22.716	23.120	23.537	Continuing	Continuing

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305240F / *Support to DCGS Enterprise*	**Project (Number/Name)** 675265 / *Common Imagery Processor (CIP)*

D. Acquisition Strategy

For imagery processing the Air Force uses an evolutionary acquisition approach with increments and spirals to develop, field, and upgrade the system and structure contracts for the improved capabilities through full and open competition to the maximum extent possible. In terms of management, Air Force leads the Cross Service Working Group that aligns imagery processing capabilities across the Joint Services in support of USD(I) direction.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305240F / *Support to DCGS Enterprise*	Project (Number/Name) 675265 / *Common Imagery Processor (CIP)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Imagery Processing Software Development	Various	Various : Various	-	11.380	Mar 2018	11.479	Dec 2018	22.392	Nov 2019	-		22.392	Continuing	Continuing	-
		Subtotal	-	11.380		11.479		22.392		-		22.392	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	11.380		11.479		22.392		-		22.392	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305240F / *Support to DCGS Enterprise*	**Project (Number/Name)** 675265 / *Common Imagery Processor (CIP)*

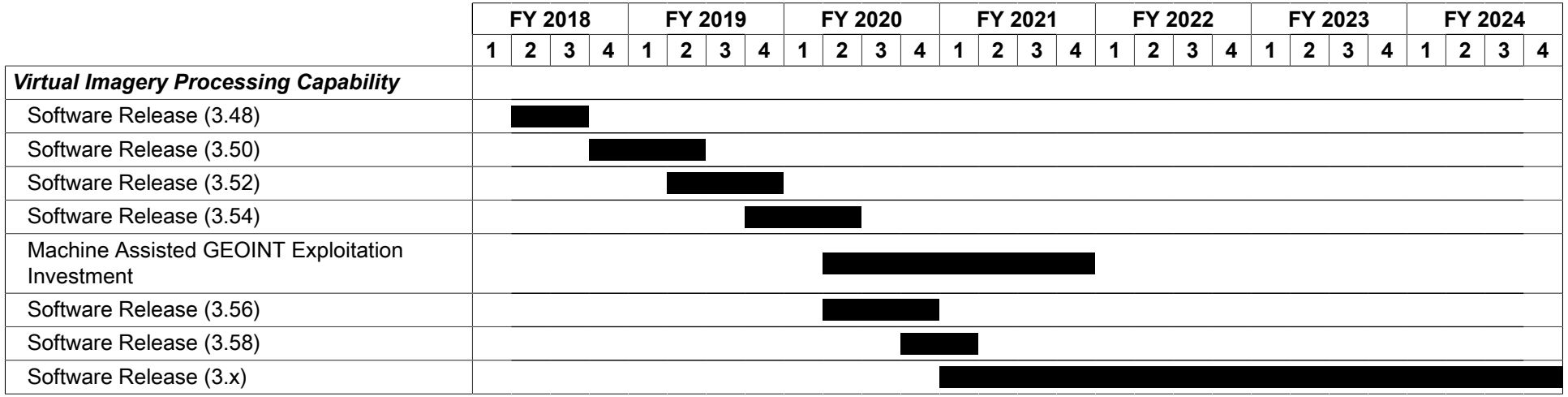

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305240F / *Support to DCGS Enterprise*	**Project (Number/Name)** 675265 / *Common Imagery Processor (CIP)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Virtual Imagery Processing Capability				
Software Release (3.48)	2	2018	3	2018
Software Release (3.50)	4	2018	2	2019
Software Release (3.52)	2	2019	4	2019
Software Release (3.54)	4	2019	2	2020
Machine Assisted GEOINT Exploitation Investment	2	2020	4	2021
Software Release (3.56)	2	2020	4	2020
Software Release (3.58)	4	2020	1	2021
Software Release (3.x)	1	2021	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305600F / *International Intelligence Technology and Architectures*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	9.491	8.464	13.515	0.000	13.515	13.660	13.711	13.780	13.938	Continuing	Continuing
675898: *International Intelligence Technology and Arc*	-	9.491	8.464	13.515	0.000	13.515	13.660	13.711	13.780	13.938	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

International Intelligence Technology and Architectures oversees, manages, and provides the United States (US) component of the multi-national Battlefield Information Collection and Exploitation Systems (US BICES) with a collaborative environment and intelligence sharing enterprise required for processing and disseminating critical intelligence information between and among US, North Atlantic Treaty Organization (NATO), allied and coalition forces. The US BICES program procures and maintains a standing intelligence information sharing capability across Department of Defense (DoD), Combat Support Agencies, and multiple Combatant Commands (CCMD) for the Office of the Under Secretary of Defense, Intelligence (OUSD(I). At the request of OUSD(I), US BICES is extended beyond NATO nations into all CCMDs to support their unique partner relationships. This architecture is known as US BICES Extended (US BICES-X). US BICES provides an "enduring" US and Coalition interoperable intelligence and information sharing multi-level secure technical architecture utilizing releasable elements of the Defense Intelligence Information Enterprise (DI2E) framework and functions to support the full spectrum of intelligence operations and dissemination throughout the DoD community. US BICES/US BICES-X has been designated the enduring intelligence and information sharing component of the Mission Partner Environment (MPE).

Research and Development funding will:
- Provide increased intelligence information sharing capabilities in support of US and coalition forces utilizing the US BICES and NATO virtual networks and provide increased database information via Distributed Common Ground System Family of Systems.
- Expand available intelligence disciplines (Geospatial Intelligence, Signal Intelligence, and potentially Human Intelligence) to support US and allied/coalition forces. Support increased intelligence advanced analytics tools, Joint Intelligence Operation Center-IT and DI2E developments to significantly increase the timeliness of intelligence and bring US BICES/NATO Special Operations Forces Headquarters/NATO Intelligence Fusion Center capabilities into the current technology baselines.
- Develop and enhance a federated Trusted Network Environment (TNE) that incorporates the Asian Pacific intelligence Information Network to support the National Defense Strategy.
- Develop multi-level security intelligence bi-laterals and multi-laterals to meet Combatant Commander Integrated Priority Lists.
- Expand capabilities for bi-lateral and multi-lateral federated TNEs in support of CCMD requirements.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305600F / *International Intelligence Technology and Architectures*

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	3.491	8.464	8.515	0.000	8.515
Current President's Budget	9.491	8.464	13.515	0.000	13.515
Total Adjustments	6.000	0.000	5.000	0.000	5.000
• 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	6.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	5.000	0.000	5.000

Change Summary Explanation

FY19 to FY20 funding increased to support additional TNE testing and integration into MPE.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: International Intelligence Technology and Architectures	9.491	8.464	13.515	0.000	13.515
Description: Continue the research and development in emerging and maturing technologies and capabilities for modernizing and transforming US BICES/US BICES-X for improved agility, scalability, access, cybersecurity, and data and information sharing tools and infrastructure. ***FY 2019 Plans:*** Continue the research and development for future releases of the TNE, to include Identity and Access Management (IdAM), peer-federated chat services, and expanding video capabilities across the enterprise. Continue the test& evaluation of new capabilities, to include the implementation and certification of new services such as VTC, metadata handling, restricted user communities for isolating authoritative data sources, integration of multi-domain relational database operations, and an application programming interface that will enhance information sharing through the use of existing applications like Share Point with the TNE.					

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305600F / *International Intelligence Technology and Architectures*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Developing and evaluating the roadmap for USD(I) including capabilities to increase the integration and use of virtualization technology; ensuring alignment and interoperability with the DI2E environment, development of new coalition ISR capabilities, and further integration with the Mission Partner Environment (MPE). ***FY 2020 Base Plans:*** Continue development of US BICES-X capabilities including further integration of TNE into the Mission Partner Environment, and development and testing of coalition ISR coalition capabilities. These efforts will enable the modernization and transformation of the USBICES/BICES-X worldwide enterprise to enable the instantiation or interconnection of any partner network to support any operation. ***FY 2020 OCO Plans:*** N/A. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding increased to support additional TNE testing and integration into MPE.					
Accomplishments/Planned Programs Subtotals	9.491	8.464	13.515	0.000	13.515

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• O&M PE 0305600F: *Int'l Intel Tech Architecture*	173.655	132.665	129.632	-	129.632	92.642	25.050	75.679	9.741	Continuing	Continuing
• OPAF 03 Line item 832050: *International Intelligence Technology and Architecture*	25.208	8.290	11.386	-	11.386	11.314	10.884	11.167	11.368	Continuing	Continuing

Remarks

The O&M Funding profile in FY21-24 will be updated/corrected in the FY21 President's Budget. The Air Force remains committed to the BICES programs. Details may be provided upon request.

E. Acquisition Strategy

Utilize existing General Dynamics Mission Systems (GDMS) contract number FA8240-18-D-0360. The contract is structured as an Indefinite Delivery Indefinite Quantity (IDIQ) contract with a period of performance beginning 1 April 2018 through 31 March 2024. US BICES also utilizes the Air Force Research Laboratory for majority of the testing of the latest TNE releases. Additionally, US BICES will utilize the General Dynamics Information Technology (GDIT) Indefinite Delivery Indefinite Quantity (IDIQ) contract with a period of performance beginning 1 June 2015 through 31 May 2023. This contract will support the integration lab efforts and the test environment.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305600F / *International Intelligence Technology and Architectures*

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305600F / *International Intelligence Technology and Architectures*	**Project (Number/Name)** 675898 / *International Intelligence Technology and Arc*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TNE Software	Various	AFRL : Rome, NY	-	9.491	Jan 2018	8.464	Jan 2019	13.515	Jan 2020	-		13.515	Continuing	Continuing	-
		Subtotal	-	9.491		8.464		13.515		-		13.515	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	9.491		8.464		13.515		-		13.515	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305600F / *International Intelligence Technology and Architectures*	**Project (Number/Name)** 675898 / *International Intelligence Technology and Arc*

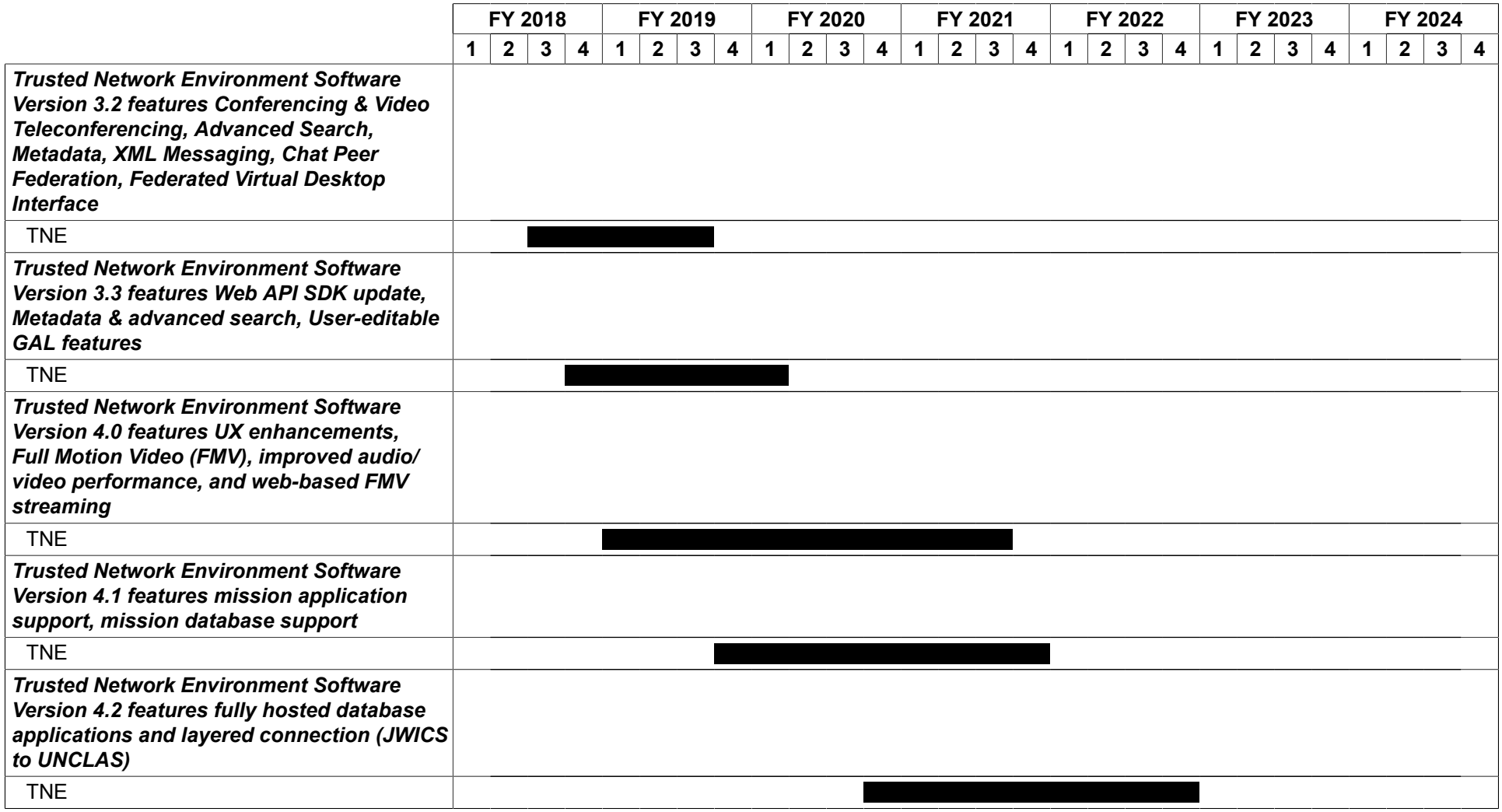

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305600F / *International Intelligence Technology and Architectures*	**Project (Number/Name)** 675898 / *International Intelligence Technology and Arc*

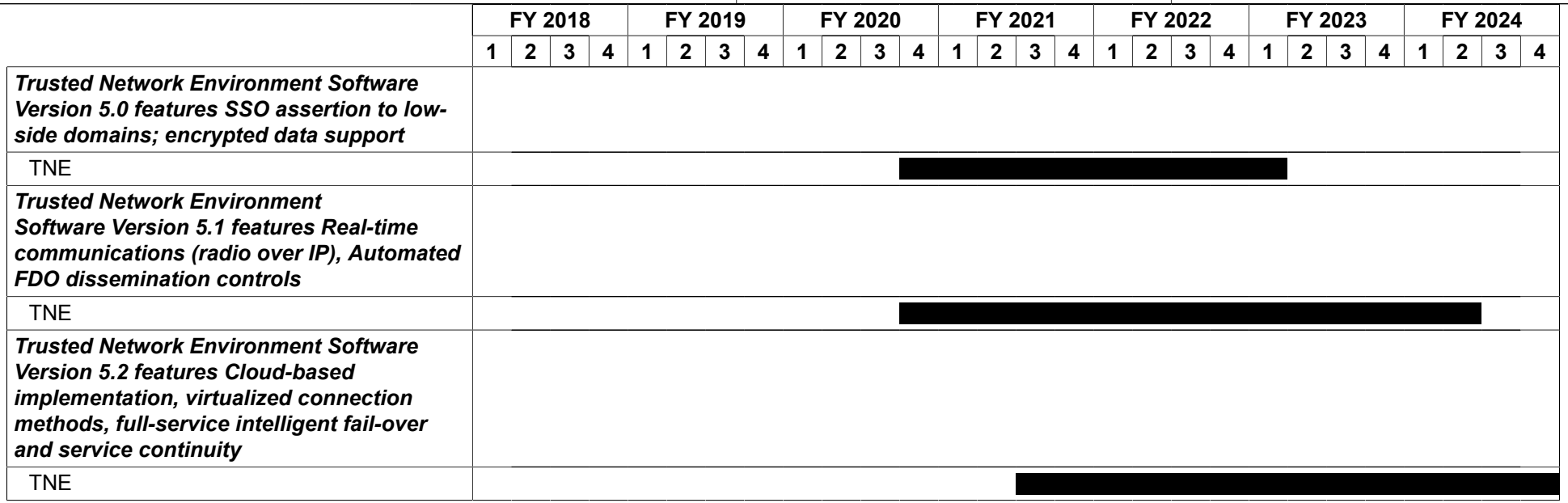

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305600F / *International Intelligence Technology and Architectures*	**Project (Number/Name)** 675898 / *International Intelligence Technology and Arc*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Trusted Network Environment Software Version 3.2 features Conferencing & Video Teleconferencing, Advanced Search, Metadata, XML Messaging, Chat Peer Federation, Federated Virtual Desktop Interface				
TNE	3	2018	3	2019
Trusted Network Environment Software Version 3.3 features Web API SDK update, Metadata & advanced search, User-editable GAL features				
TNE	4	2018	1	2020
Trusted Network Environment Software Version 4.0 features UX enhancements, Full Motion Video (FMV), improved audio/video performance, and web-based FMV streaming				
TNE	1	2019	3	2021
Trusted Network Environment Software Version 4.1 features mission application support, mission database support				
TNE	4	2019	4	2021
Trusted Network Environment Software Version 4.2 features fully hosted database applications and layered connection (JWICS to UNCLAS)				
TNE	4	2020	4	2022
Trusted Network Environment Software Version 5.0 features SSO assertion to low-side domains; encrypted data support				
TNE	4	2020	1	2023
Trusted Network Environment Software Version 5.1 features Real-time communications (radio over IP), Automated FDO dissemination controls				
TNE	4	2020	2	2024

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305600F / *International Intelligence Technology and Architectures*	**Project (Number/Name)** 675898 / *International Intelligence Technology and Arc*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Trusted Network Environment Software Version 5.2 features Cloud-based implementation, virtualized connection methods, full-service intelligent fail-over and service continuity				
TNE	3	2021	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305881F / *Rapid Cyber Acquisition*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	4.720	4.303	4.383	0.000	4.383	4.460	4.552	4.635	9.289	Continuing	Continuing
670374: *Electronic Combat Spt, C3 Protection/Multi-Mission, Technology and Spt*	-	4.720	4.303	4.383	0.000	4.383	4.460	4.552	4.635	9.289	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Rapid Cyber Acquisition as executed by the Cyber Capabilities Support Office (CCSO) delivers rapid offensive cyber and network exploitation capabilities to the 24th Air Force, Combatant Commanders, and Joint Force Commanders in mission-relevant timeframes (0-60 days). These capabilities support US national security interests and enhance the nation's ability to operate within the highly-dynamic cyberspace domain. The CCSO provides novel solution sets for offensive cyberspace operations to include attack, network exploitation, command and control, situational awareness, and combat support during all phases of warfare.

The CCSO expedites cyber development and modifications of USAF and DoD cyber capabilities through the integration with and technical support to other Service and Government Agency activities to leverage select Air Force-developed technologies and/or operational capabilities. CCSO develops material or non-material cyber solutions and conducts rapid prototyping, integration, and transition activities of cyber capabilities. Activities include but are not limited to development of software/ hardware systems, integration and transition of lab-developed cyber capabilities, developmental testing, operational evaluation, manpower, studies, analysis, pilots, demonstrations, and risk reduction efforts for emerging technologies.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305881F / *Rapid Cyber Acquisition*	

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	4.899	4.303	4.383	0.000	4.383
Current President's Budget	4.720	4.303	4.383	0.000	4.383
Total Adjustments	-0.179	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	-0.179	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: RCA Hardware/Software Development ***Description:*** Hardware and software cyber security enhancement in support of offensive, defensive, command and control/situational awareness weapon system requirements. ***FY 2019 Plans:*** N/A ***FY 2020 Base Plans:*** N/A ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A	4.121	0.000	0.000	0.000	0.000
Title: RCA Hardware Integration ***Description:*** Integrates organically developed and/or acquired capabilities for the following AF Weapon System Sustainment (WSS) programs: Cyberspace Vulnerability Assessment/Hunter (CVA/H), Cyber Security Control System (CSCS), Cyberspace Defense Analysis (CDA), Air Force Cyber Defense (ACD), and Cyber Command and Control Mission System (C3MS).	0.499	0.000	0.000	0.000	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305881F / *Rapid Cyber Acquisition*	

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
FY 2019 Plans: N/A ***FY 2020 Base Plans:*** N/A ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A					
Title: Test and Evaluation ***Description:*** Provides a secure network environment to support developmental testing in preparation for the fielding of RCA efforts. ***FY 2019 Plans:*** N/A ***FY 2020 Base Plans:*** N/A ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A	0.100	0.000	0.000	0.000	0.000
Title: Cyber Capability Support Office ***Description:*** Provides a standing research and development team to leverage funding from cyber operations requirements owners to conduct quick look assessments, solution design, rapid prototyping, testing and quick reaction fielding of cyber capabilities. ***FY 2019 Plans:*** - Provide professional and technical subject matter expertise and guidance for offensive and defensive cyber operations and computer network exploitation information systems to support the Air Force's mission objectives	0.000	4.303	4.383	0.000	4.383

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305881F / *Rapid Cyber Acquisition*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
- Develop a highly skilled rapid reaction team to prototype and deliver capability within 0-60 days, and perform quick look operational and technical assessments of cyber capabilities - Execute target systems with a multidisciplinary targeting cell to analyze and accomplish developmental planning in support of the USAF cyber operations mission - Provide a secure lab capability to support research, prototyping, development, and testing of cyber capabilities ***FY 2020 Base Plans:*** - Will provide professional and technical subject matter expertise to deliver direction and guidance for offensive cyber operations and computer network exploitation information systems to support the Air Force's cyber mission objectives - Will implement multidisciplinary targeting, execute target systems analysis, and conduct developmental planning in support of the USAF cyber mission - Will design cyber solutions to meet specific combatant command, AF major command, and other agency requirements - Will utilize a highly skilled rapid reaction team to prototype and deliver cyber capability and perform quick look operational and technical assessments - Will provide a secure lab capability to support research, prototyping, development, and testing of cyber warfare capabilities ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding increased due to additional offensive & defensive cyber operations architecture and analytical efforts.					
Accomplishments/Planned Programs Subtotals	4.720	4.303	4.383	0.000	4.383

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

Within Rapid Cyber Acquisition, the Cyber Capabilities Support Office (CCSO) utilizes a tailorable acquisition strategy that facilitates rapid delivery of material and non-material solutions to solve operational cyber operations requirements. This approach allows flexibility for solutions to enter the acquisitions process at any phase of the acquisition life cycle. All plans contain sufficient information for the Milestone Decision Authority to determine readiness to enter into the applicable phase of the

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305881F / *Rapid Cyber Acquisition*

acquisition process. CCSO provides the research and development, developmental testing, necessary facilities, and associated costs supporting cyber innovation leveraging funding from Air Force and combatant commands with offensive cyber operations requirements. This funding supports rapid development, technology transition and/or acquisition of cyber capabilities. CCSO analyzes, develops, tests, and transitions cyber capabilities to meet sponsor requirements. CCSO acquisition strategies in support of sponsor funded projects consider existing contracting and other transaction authority vehicles.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305881F / *Rapid Cyber Acquisition*	**Project (Number/Name)** 670374 / *Electronic Combat Spt, C3 Protection/Multi-Mission, Technology and Spt*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
RCA HW Integration	Various	Various : Various	-	0.158	May 2018	-		-		-		-	0.000	0.158	0.000
RCA (LOGAN) ACTD	MIPR	AFRL : Rome, NY	-	2.410	Jan 2018	-		-		-		-	0.000	2.410	0.000
RCA HW/SW (Architecture Development)	Various	Various : Various	-	1.618	Jun 2018	-		-		-		-	0.000	1.618	0.000
		Subtotal	-	4.186		-		-		-		-	0.000	4.186	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Cyber Capabilities Support Office (CCSO) Interagency Personnel Agreement (IPA)	SS/FFP	MIT Lincoln Laboratory : Lexington, MA	-	-		0.389	Dec 2018	0.389	Dec 2019	-		0.389	Continuing	Continuing	0.389
Due Diligence Research & Analysis	SS/CPFF	Novetta solutions : Mclean, VA	-	-		0.157	Mar 2019	0.157	Mar 2020	-		0.157	Continuing	Continuing	0.157
Cyber Capability Design	C/FFP	X8 Solutions, Inc : Oak Hill, VA	-	-		1.670	Nov 2018	1.750	Nov 2019	-		1.750	Continuing	Continuing	1.670
Internal Development	SS/CPFF	JHU Applied Physics Jab : Baltimore, MD	-	-		1.728	Apr 2019	1.728	Apr 2020	-		1.728	Continuing	Continuing	1.728
		Subtotal	-	-		3.944		4.024		-		4.024	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation Support	MIPR	Various : Various	-	0.100		-		-		-		-	0.000	0.100	0.000
Joint Information Range Development Environment	SS/CPFF	Novetta Solutions : Mclean, VA	-	-		0.359	May 2019	0.359	May 2020	-		0.359	Continuing	Continuing	0.359

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305881F / *Rapid Cyber Acquisition*	**Project (Number/Name)** 670374 / *Electronic Combat Spt, C3 Protection/Multi-Mission, Technology and Spt*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	0.100		0.359		0.359		-		0.359	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMA - Engineering and Technical Support Services (FFRDC)	C/CPFF	MITRE : Hanscom, MA	-	0.200	Mar 2018	-		-		-		-	0.000	0.200	0.000
PMA Acquisition Support	C/Various	Various : San Antonio, TX	-	0.234	Mar 2018	-		-		-		-	0.000	0.234	0.000
		Subtotal	-	0.434		-		-		-		-	0.000	0.434	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	4.720		4.303		4.383		-		4.383	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305881F / *Rapid Cyber Acquisition*	**Project (Number/Name)** 670374 / *Electronic Combat Spt, C3 Protection/Multi-Mission, Technology and Spt*

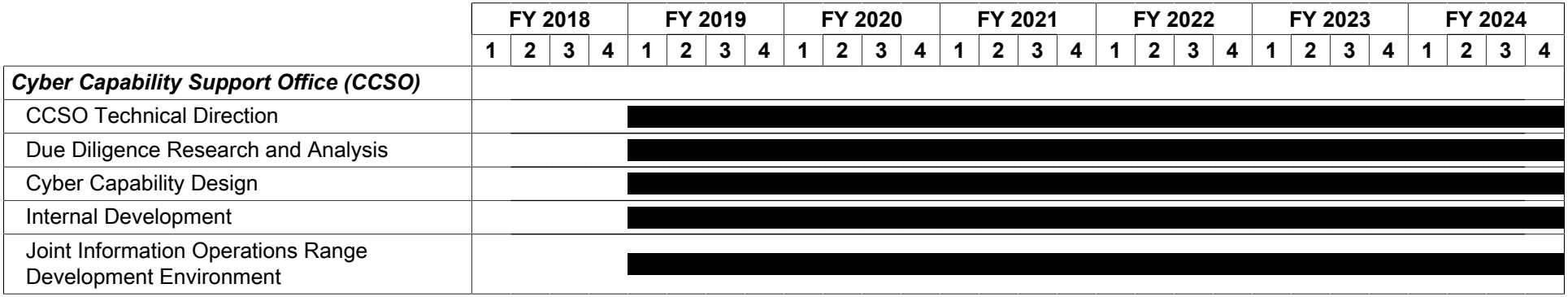

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305881F / *Rapid Cyber Acquisition*	**Project (Number/Name)** 670374 / *Electronic Combat Spt, C3 Protection/Multi-Mission, Technology and Spt*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Cyber Capability Support Office (CCSO)				
CCSO Technical Direction	1	2019	4	2024
Due Diligence Research and Analysis	1	2019	4	2024
Cyber Capability Design	1	2019	4	2024
Internal Development	1	2019	4	2024
Joint Information Operations Range Development Environment	1	2019	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305984F / *Personnel Recovery Command & Ctrl (PRC2)*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	2.364	2.466	2.133	0.000	2.133	2.556	2.609	2.656	2.704	Continuing	Continuing
675221: *Personnel Recovery Command and Control (PRC2)*	-	2.364	2.466	2.133	0.000	2.133	2.556	2.609	2.656	2.704	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project funds operational development necessary to acquire, modify, and sustain a segment of Air Force's C2 capabilities and services associated with Personnel Recovery (PR). The Personnel Recovery Command and Control (PRC2) program develops and delivers tools and services for planning, collaborating and managing search and rescue efforts, as well as disseminating related information to all personnel recovery mission coordinators across the PR network. PRC2 provides an adaptive and networked system, delivering timely situational awareness information supporting personnel accountability and recovery mission management worldwide. PRC2 delivers a globally accessible, collaborative, inter-operable and integrated set of capabilities to prevent, prepare for and respond to joint/coalition military personnel recovery activities, and civilian rescue missions. The Joint Personnel Recovery (JPR) Initial Capability Document (ICD) (2012) articulates capabilities needed for PRC2.

The system collects, stores and delivers personnel/identity biometric data, emergency locator beacon registrations, isolated personnel reports, evasion plans of action, incident reports and other information management capabilities. The information is used for predictive, preventive and personnel vulnerability analysis and assessment in support of PR across the Department of Defense and other national and international entities. Activities also include studies and analysis to support both current program planning and execution, as well as future program planning.

In FY 2020, Personnel Recover Mission Manager (PRMM) modifications will use an Agile software development strategy to develop, test and field PRMM versions in two week increments. The modifications will improve/validate Isolated Personnel (IP) events/alerts and enable case files for Defense Prisoner of War/Missing Personnel Office (DPMO) and Joint Personnel Recovery Agency (JPRA). PRMM modifications will reflect the requirements and priorities identified by Air Combat Command (ACC) as the personnel recovery environment evolves to meet the needs of the war-fighter and personnel recovery efforts.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver PRC2 weapon system capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, and 0605898F.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305984F / *Personnel Recovery Command & Ctrl (PRC2)*

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	2.445	2.466	2.512	0.000	2.512
Current President's Budget	2.364	2.466	2.133	0.000	2.133
Total Adjustments	-0.081	0.000	-0.379	0.000	-0.379
• 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	-0.081	0.000			
• Other Adjustments	0.000	0.000	-0.379	0.000	-0.379

Change Summary Explanation

FY 2020 funding request was reduced by $0.379 million to account for the availability of prior year execution balances.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: PRC2 - PRMM Development	2.154	2.256	1.933	0.000	1.933
Description: PRC2 will use an agile software development strategy to test and field tools and services for planning and managing search and rescue efforts, and disseminate the related information for personnel recovery. ***FY 2019 Plans:*** - Develop, test and field PRMM versions 2.0.1 through 3.0.9 in two-week increments; development effort will encompass an interface with the Common Distress Reporting System (CDRS) to provide various user interface upgrades and application improvements for Personnel Recovery Coordination ***FY 2020 Base Plans:*** - Develop, test and field PRMM versions 4.0.0 through 5.0.9 in two-week increments; development effort will encompass an interface with the CDRS to provide various user interface upgrades and application improvements for Personnel Recovery Coordination ***FY 2020 OCO Plans:***					

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305984F / *Personnel Recovery Command & Ctrl (PRC2)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding decreased due to sprints.					
Title: PRC2 - PRMM Test and Evaluation ***Description:*** Test and Evaluation ***FY 2019 Plans:*** - Test and field PRMM Versions 2.0.1 through 3.0.9 ***FY 2020 Base Plans:*** - Test and field PRMM Versions 4.0.0 through 5.0.9 ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A	0.100	0.100	0.100	0.000	0.100
Title: PRC2 Hanscom milCloud (HmC) Software Licenses ***Description:*** MilCloud subscription support to demonstrate PRMM capabilities and tests ***FY 2019 Plans:*** - Testing platform for customer feedback ***FY 2020 Base Plans:*** - Testing platform for customer feedback ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A	0.110	0.110	0.100	0.000	0.100
Accomplishments/Planned Programs Subtotals	2.364	2.466	2.133	0.000	2.133

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305984F / *Personnel Recovery Command & Ctrl (PRC2)*

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPAF 03 834520: *Theater Battle Mgt C2 System*	1.286	1.301	0.323	-	0.323	0.347	0.372	0.396	0.421	Continuing	Continuing

Remarks

E. Acquisition Strategy

PRC2 product support is provided to the program office by the 517th Software Maintenance Squadron (517 SMXS), Hill AFB Utah, in accordance with a memorandum of agreement and on a fee for service basis. This strategy to utilize the 517 SMXS for agile product development and sustainment was reviewed and approved by the Air Force Program Executive Officer for Digital, and implemented in mid-FY 2014. The work done by the 517 SMXS includes, but is not limited to, modernization development, sustainment support services, and software maintenance of the PRC2 system.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305984F / *Personnel Recovery Command & Ctrl (PRC2)*	Project (Number/Name) 675221 / *Personnel Recovery Command and Control (PRC2)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PRC2 - PRMM Agile Software Development	PO	Ogden ALC : Hill AFB, UT	-	2.144	Dec 2017	2.246	Dec 2018	1.923	Dec 2019	-		1.923	Continuing	Continuing	-
		Subtotal	-	2.144		2.246		1.923		-		1.923	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PRC2 - PRMM Hanscom milCloud (HmC) Software Licenses	MIPR	General Services Admin : Boston, MA	-	0.110	Dec 2017	0.110	Dec 2018	0.100	Dec 2019	-		0.100	Continuing	Continuing	-
		Subtotal	-	0.110		0.110		0.100		-		0.100	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PRC2 - PRMM Test and Evaluation	PO	45th Test Squadron : Eglin AFB, FL	-	0.100	Dec 2017	0.100	Dec 2018	0.100	Dec 2019	-		0.100	Continuing	Continuing	-
		Subtotal	-	0.100		0.100		0.100		-		0.100	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PRC2 - PRMM Program Management Administration	TBD	Various : Hill AFB, UT	-	0.010	Mar 2018	0.010	Mar 2019	0.010	Mar 2020	-		0.010	Continuing	Continuing	-
		Subtotal	-	0.010		0.010		0.010		-		0.010	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305984F / *Personnel Recovery Command & Ctrl (PRC2)*	Project (Number/Name) 675221 / *Personnel Recovery Command and Control (PRC2)*	

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	2.364		2.466		2.133		-		2.133	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305984F / *Personnel Recovery Command & Ctrl (PRC2)*	**Project (Number/Name)** 675221 / *Personnel Recovery Command and Control (PRC2)*

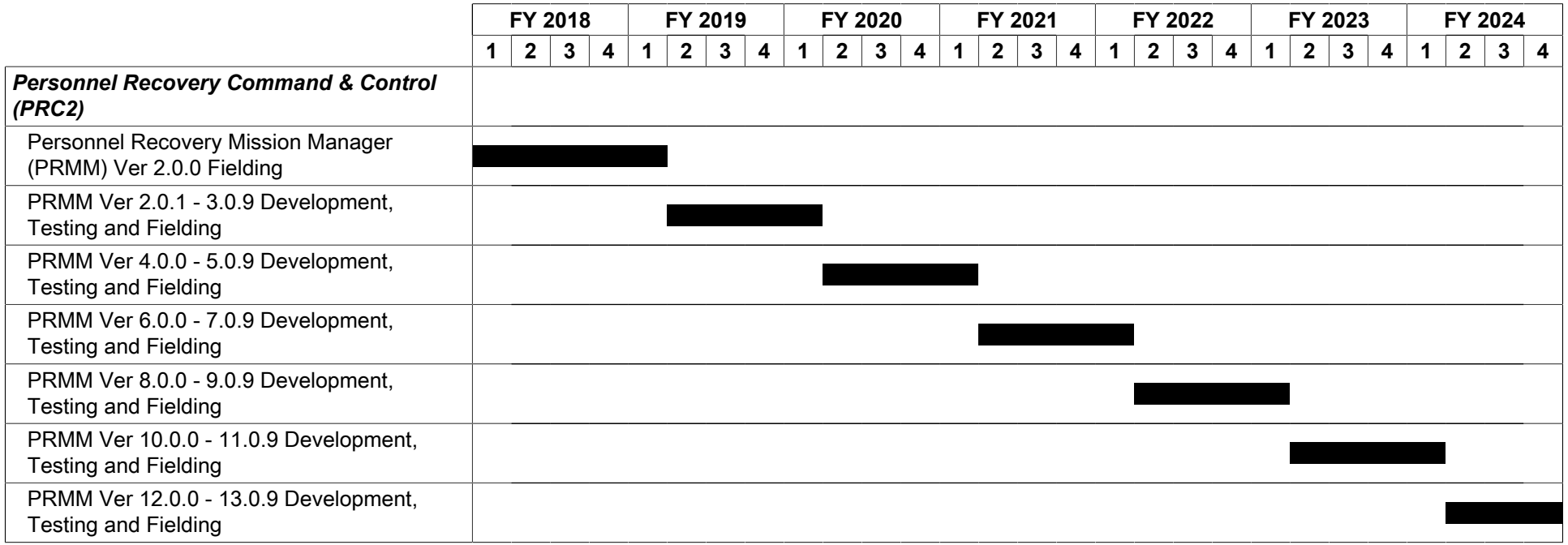

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305984F / *Personnel Recovery Command & Ctrl (PRC2)*	**Project (Number/Name)** 675221 / *Personnel Recovery Command and Control (PRC2)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Personnel Recovery Command & Control (PRC2)				
Personnel Recovery Mission Manager (PRMM) Ver 2.0.0 Fielding	1	2018	1	2019
PRMM Ver 2.0.1 - 3.0.9 Development, Testing and Fielding	2	2019	1	2020
PRMM Ver 4.0.0 - 5.0.9 Development, Testing and Fielding	2	2020	1	2021
PRMM Ver 6.0.0 - 7.0.9 Development, Testing and Fielding	2	2021	1	2022
PRMM Ver 8.0.0 - 9.0.9 Development, Testing and Fielding	2	2022	1	2023
PRMM Ver 10.0.0 - 11.0.9 Development, Testing and Fielding	2	2023	1	2024
PRMM Ver 12.0.0 - 13.0.9 Development, Testing and Fielding	2	2024	4	2024

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0307577F / *Intelligence Mission Data (IMD)*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	8.684	4.117	8.614	0.000	8.614	7.768	6.601	6.479	6.952	Continuing	Continuing
675306: *Analysis Enterprise*	-	5.074	1.337	7.820	0.000	7.820	7.768	6.601	6.479	6.952	Continuing	Continuing
675307: *TARGETING ENTERPRISE RESEARCH*	-	3.610	2.780	0.794	0.000	0.794	0.000	0.000	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

Intelligence Mission Data (IMD) encompasses several key intelligence data efforts used to support IMD-dependent programs, including the fifth generation aircraft capabilities. The term IMD encompasses Red (adversary military systems), White (commercial systems), Blue (U.S. military systems), and Grey (neutral military systems) Characteristics & Performance; Signatures; Geospatial Intelligence; Electronic Warfare systems and Operational Order of Battle mission data. Supports fighter/bomber operational reconnaissance and integration, focusing on leveraging fifth generation aircraft capabilities to augment the entire Combat Air Force. The PE funds: Planning & direction, collection, processing & exploitation, analysis & production, and dissemination & Evaluation (PCPAD-E) to support IMD-dependent programs.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	8.684	4.117	2.033	0.000	2.033
Current President's Budget	8.684	4.117	8.614	0.000	8.614
Total Adjustments	0.000	0.000	6.581	0.000	6.581
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	6.581	0.000	6.581

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0307577F / *Intelligence Mission Data (IMD)*

Change Summary Explanation

$6.581M added via internal re-alignment in FY20, adding $4.019M in a ZBT balancing 3400 to 3600 funding. That ZBT will support mission data reprogramming on F-35 and B-2 Defense Management System Modernization and develop threat modeling technology to meet AF needs. The $2.562 came from the Acquisition Intelligence Requirements Task Force/OUSD-I for execution of responsibilities for Intel Mission Data mission.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0307577F / *Intelligence Mission Data (IMD)*	Project (Number/Name) 675306 / *Analysis Enterprise*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675306: *Analysis Enterprise*	-	5.074	1.337	7.820	0.000	7.820	7.768	6.601	6.479	6.952	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In FY 2018, PE 0207431F, Combat Air Intelligence Systems, Intelligence Mission Data efforts were transferred to new for 2018 PE 0307577F, Intelligence Mission Data (IMD), in order to provide better oversight of IMD research and development. (+$5.074M)

Intelligence Mission Data efforts in BPAC 675306 fund RDT&E to enable Advanced Non-cooperative Target Recognition (NCTR) collection, Operational Reconnaissance and traditional ELINT capabilities, advanced all-source analysis and production of IMD across EWIR, C&P, and Signatures to enable combat ID and ensure survivability for air superiority and global strike platforms.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: NCTR Collection and IMD Production Tools	5.074	1.337	7.820
Description: Development of MASINT collection systems, creation of automated tools to process ELINT data, and development of improved analysis, production, and dissemination tools to create IMD used for combat ID. ***FY 2019 Plans:*** - Complete development and upgrade of 3 collection sensors - Continue development of automated tools to PROCESS ELINT data for utilization in EWIR - Begin development of C&P tools to enable automated processing of data for IMD purposes - Continue Development of new modeling tools to create Measurement and Signatures of emerging threats ***FY 2020 Plans:*** Continue development of automated tools to disseminate measurement and signatures information, EWIR, C&P including developing and integrating automation machine learning to develop, document, and deliver models of advanced threat systems. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increased due to increased requirements.			
Accomplishments/Planned Programs Subtotals	5.074	1.337	7.820

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0307577F / *Intelligence Mission Data (IMD)*	**Project (Number/Name)** 675306 / *Analysis Enterprise*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPAF 07 030577F: *Intelligence Mission Data*	1.313	0.606	0.000	-	0.000	0.514	0.000	0.000	-	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0307577F / *Intelligence Mission Data (IMD)*	**Project (Number/Name)** 675306 / *Analysis Enterprise*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NCTR Collection and IMD Production Tools Development	Various	NASIC : WPAFB, OH	-	5.074	Feb 2018	1.337	Mar 2019	7.820	Feb 2020	-		7.820	Continuing	Continuing	-
		Subtotal	-	5.074		1.337		7.820		-		7.820	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	5.074		1.337		7.820		-		7.820	Continuing	Continuing	N/A

Remarks

Contract award is expected 90 days after budget authority for FY18. FY19 will be one year after FY18.

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0307577F / *Intelligence Mission Data (IMD)*	**Project (Number/Name)** 675306 / *Analysis Enterprise*

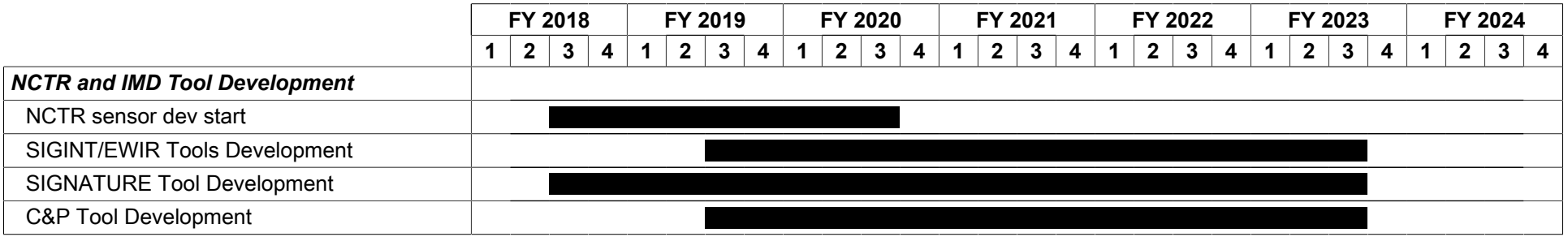

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0307577F / *Intelligence Mission Data (IMD)*	**Project (Number/Name)** 675306 / *Analysis Enterprise*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
NCTR and IMD Tool Development				
NCTR sensor dev start	3	2018	3	2020
SIGINT/EWIR Tools Development	3	2019	3	2023
SIGNATURE Tool Development	3	2018	3	2023
C&P Tool Development	3	2019	3	2023

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0307577F / *Intelligence Mission Data (IMD)*	Project (Number/Name) 675307 / *TARGETING ENTERPRISE RESEARCH*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675307: *TARGETING ENTERPRISE RESEARCH*	-	3.610	2.780	0.794	0.000	0.794	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2018, PE 0207431F, Combat Air Intelligence Systems, Intelligence Mission Data efforts were transferred to the new PE 37577F for 2018, Intelligence Mission Data (IMD), in order to provide better oversight of IMD research and development.

A. Mission Description and Budget Item Justification

In FY 2018, PE 0207431F, Combat Air Intelligence Systems, Intelligence Mission Data efforts were transferred to new for 2018 PE 0307577F, Intelligence Mission Data (IMD), in order to provide better oversight of IMD research and development. (+$5.074M)
Intelligence Mission Data efforts in BPAC 675307, Targeting Enterprise Research, fund RDT&E for Operational Reconnaissance Capabilities; Tactical Data Recorder; Advanced Non-cooperative Target Recognition (NCTR) Collection.
These tools enable the collection, storage, and dissemination of Ops Recce data gathered during operational missions by currently fielded air platforms.
In addition, the Advanced NCTR collection sensor supports CAF-wide requirements for improved ID capabilities.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Operational Reconnaissance Electronic Warfare Capabilities	3.610	2.780	0.794
Description: RDT&E efforts to develop recording, storage, and dissemination systems for Ops Recce data gathered during operational missions. ***FY 2019 Plans:*** Continue RDT&E efforts to develop recording, storage, and dissemination systems for Ops Recce data gathered during non-ISR operational missions. These include but are not limited to data off-boarding and radar warning receiver performance assessment. ***FY 2020 Plans:*** Will continue RDT&E efforts to develop recording, storage, and dissemination systems for Ops Recce data gathered during non-ISR operational missions. These include but are not limited to data off-boarding and radar warning receiver performance assessment. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease in funding due to program requirements			
Accomplishments/Planned Programs Subtotals	3.610	2.780	0.794

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0307577F / *Intelligence Mission Data (IMD)*	**Project (Number/Name)** 675307 / *TARGETING ENTERPRISE RESEARCH*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPAF 03 Line Item 832070: *Intelligence Comm Equipment*	1.313	0.606	0.000	-	0.000	0.514	0.000	0.000	-	Continuing	Continuing

Remarks

D. Acquisition Strategy

Capabilities will be developed and integrated onto various platforms using an incremental acquisition approach. The projects will be executed, contracting with appropriate vendor(s) to deliver capability while encouraging competition where possible.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0307577F / *Intelligence Mission Data (IMD)*	**Project (Number/Name)** 675307 / *TARGETING ENTERPRISE RESEARCH*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ops Recce Database Projects	Various	Not specified. : TBD	-	3.249	Oct 2017	2.502	Oct 2018	0.794		-		0.794	Continuing	Continuing	-
Not specified.	C/CPAF	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-
		Subtotal	-	3.249		2.502		0.794		-		0.794	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMA	Various	Not specified. : TBD	-	0.361	Oct 2017	0.278	Oct 2018	0.000		-		0.000	Continuing	Continuing	-
		Subtotal	-	0.361		0.278		0.000		-		0.000	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	3.610		2.780		0.794		-		0.794	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0307577F / *Intelligence Mission Data (IMD)*	**Project (Number/Name)** 675307 / *TARGETING ENTERPRISE RESEARCH*

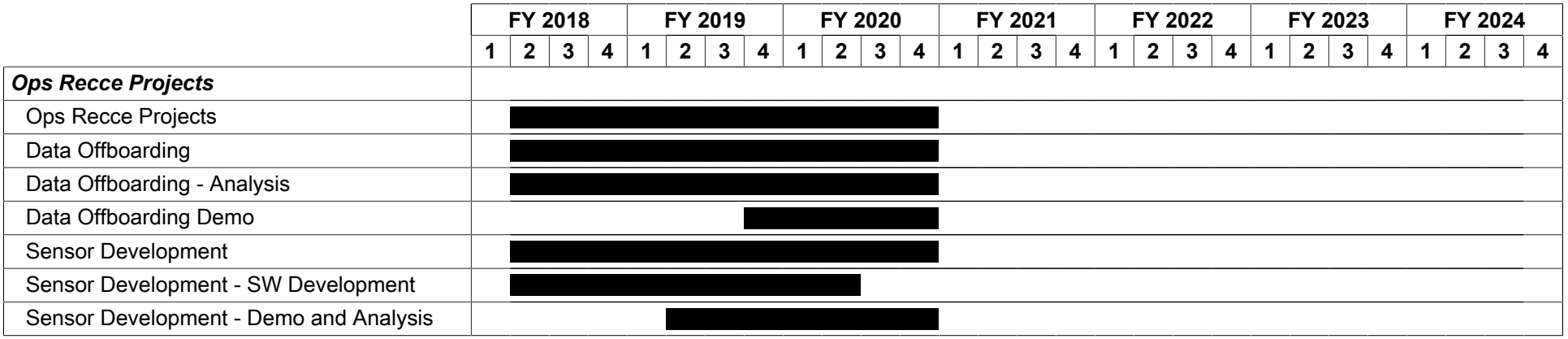

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0307577F / *Intelligence Mission Data (IMD)*	**Project (Number/Name)** 675307 / *TARGETING ENTERPRISE RESEARCH*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Ops Recce Projects				
Ops Recce Projects	2	2018	4	2020
Data Offboarding	2	2018	4	2020
Data Offboarding - Analysis	2	2018	4	2020
Data Offboarding Demo	4	2019	4	2020
Sensor Development	2	2018	4	2020
Sensor Development - SW Development	2	2018	2	2020
Sensor Development - Demo and Analysis	2	2019	4	2020

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0401115F / *C-130 Airlift Squadron*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	10.219	105.988	140.425	0.000	140.425	113.473	34.207	0.400	0.406	0.000	405.118
672030: *C-130 MUOS Radio*	-	0.000	0.000	15.800	0.000	15.800	0.000	0.400	0.400	0.400	0.000	17.000
675248: *C-130H Avionics Modernization Program (AMP) Increment 1*	-	2.894	5.864	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.758
675250: *C-130H Avionics Modernization Program (AMP) Increment 2*	-	7.325	100.124	124.625	0.000	124.625	113.473	33.807	0.000	0.006	0.000	379.360

Note

This program, BA 7, PE 0401115F, project 672030, RDT&E MOUS Radios, is a new start.

A. Mission Description and Budget Item Justification

The C-130H is a medium sized tactical transport aircraft providing multi-purpose theater support throughout the globe. The C-130H fleet supports several diverse Air Force roles, including but not limited to tactical and inter-theater airlift and airdrop support, Arctic resupply, special operations support, aeromedical evacuation, aerial spraying, firefighting duties, and natural disaster and humanitarian relief missions.

C-130H AMP Increment 1 addresses modifications to meet airspace compliance mandates and safety requirements. RDT&E efforts cover design, integration, developmental and operational test, studies and risk reduction efforts, trial kit buy and installation, spares and peculiar support equipment in support of trial kit installs, type 1 training and C-130H aircrew and maintenance training systems and course ware development efforts and other efforts necessary to fulfill program requirements.

C-130H AMP Increment 2 includes digital avionics upgrades (e.g. Flight Management System, improved navigation), cockpit modernization (e.g. glass/engine flight displays) and resolves select obsolescence and Diminishing Manufacturing Source (DMS) issues. RDT&E efforts will cover software development, design, integration, developmental and operational test, studies and risk reduction efforts, trial kit buy and installation, technical order development validation and verification, spares and peculiar support equipment in support of trial kit installs, Systems Integration Laboratory (SIL) development, type 1 training and C-130H aircrew and maintenance training systems and course ware development efforts, and other efforts necessary to fulfill program requirements.

The MUOS radio funding is required for the Non Recurring Effort associated with integration, testing, TO's, Engineering drawing's, TKI, VKI, spectrum authorization, and Group A and Group B kits to support 19 aircraft. This funding includes Rapid Global Mobility (RGM) platform related activities including but not limited to fielding actions. Funds in FY 22-24 are required to fund additional LRIP unique C-130H aircraft requirements.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401115F / *C-130 Airlift Squadron*

This funding includes Rapid Global Mobility (RGM) platform related activities including but not limited to prototyping, capability development, process activities, planning analysis and systems engineering activities.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver C-130H weapon system capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F. The program may also include any Contractor Manpower Equivalent (CME)/A&AS support deemed necessary to support the program objectives.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	10.219	105.988	127.778	0.000	127.778
Current President's Budget	10.219	105.988	140.425	0.000	140.425
Total Adjustments	0.000	0.000	12.647	0.000	12.647
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	12.647	0.000	12.647

Change Summary Explanation

The FY20 change of $12.647M is a result of the addition of $15.8M for the Mobile User Objective System Radio (MUOS), a new start, and the reduction of $3.153M for AMP Increment 2.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0401115F / *C-130 Airlift Squadron*	Project (Number/Name) 672030 / *C-130 MUOS Radio*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
672030: *C-130 MUOS Radio*	-	0.000	0.000	15.800	0.000	15.800	0.000	0.400	0.400	0.400	0.000	17.000
Quantity of RDT&E Articles	-	-	-	19	-	19	-	-	-	-		

Note

This program, BA 7, PE 0401115F, project 672030, RDT&E MOUS Radios, is a new start.

A. Mission Description and Budget Item Justification

The MUOS radio funding is required for the Non Recurring Effort associated with integration, testing, TO's, Engineering drawing's, TKI, VKI, spectrum authorization, and Group A and Group B kits to support 19 aircraft. This funding includes Rapid Global Mobility (RGM) platform related activities including but not limited to fielding actions.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: RDT&E MOUS Radios	0.000	0.000	15.800	0.000	15.800
Description: RDT&E for LRIP of 19 Group and Group B MOUS radios ARC-210 ***FY 2019 Plans:*** N/A ***FY 2020 Base Plans:*** Initial $15.8M will fund MOUS ARC-210 radio effort is for NRE to include TO's, Engineering drawing's, TKI, VKI, spectrum authorization and Group A and Group B kits to support 19 Aircraft. This includes Rapid Global Mobility (RGM) platform related activities including but not limited to fielding actions ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** New start for FY20					
Accomplishments/Planned Programs Subtotals	0.000	0.000	15.800	0.000	15.800

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Complete Non Recurring Efforts for MOUS radio upgrade. Funds in FY 22-24 are required for additional LRIP kits.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401115F / *C-130 Airlift Squadron*	**Project (Number/Name)** 672030 / *C-130 MUOS Radio*

D. Acquisition Strategy

A Small Business Set Aside Contract will provide the Non Recurring Engineering required to integrate the ARC-210 radios onto 19 C-130H aircraft. A procurement acquisition strategy will be developed once a solution is integrated on the LRIP aircraft.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0401115F / *C-130 Airlift Squadron*	Project (Number/Name) 672030 / *C-130 MUOS Radio*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MOUS Contract TBD	C/CPFF	Not specified. : TBD	-	-		-		15.800	Dec 2020	-		15.800	Continuing	Continuing	-
		Subtotal	-	-		-		15.800		-		15.800	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		0.000		15.800		-		15.800	Continuing	Continuing	N/A

Remarks

Funds in FY 22-24 are required to fund additional LRIP unique C-130H aircraft.

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401115F / *C-130 Airlift Squadron*	**Project (Number/Name)** 672030 / *C-130 MUOS Radio*

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
New Contract																												
New Contract for NRE and Kit Build																												

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401115F / *C-130 Airlift Squadron*	**Project (Number/Name)** 672030 / *C-130 MUOS Radio*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
New Contract				
New Contract for NRE and Kit Build	4	2020	2	2021

Note

Funds in FY 22-24 are required to fund additional LRIP unique C-130H aircraft.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0401115F / *C-130 Airlift Squadron*	Project (Number/Name) 675248 / *C-130H Avionics Modernization Program (AMP) Increment 1*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675248: *C-130H Avionics Modernization Program (AMP) Increment 1*	-	2.894	5.864	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.758
Quantity of RDT&E Articles	-	4	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The C-130H AMP Increment 1 program performs modifications to meet airspace compliance and safety mandates; the mod includes automatic dependent surveillance-broadcast (ADS-B) Out, enhanced Mode S, 8.33 kHz radios, and cockpit voice recorder/digital flight data recorder (CVR/DFDR).

RDT&E efforts include but are not limited to, design, integration, development and operational test, studies and risk reduction efforts, trial kit buy and installation, spares and peculiar support equipment in support of trial kit installs, type 1 training and C-130H aircrew and maintenance training systems and courseware development efforts (including Mode 5 effort for the trainers) and other efforts necessary to fulfill program mandates and requirements. Obsolescence and Diminishing Manufacturing Sources (DMS) issues will be resolved with solutions that may include life of type buys or bridge buys. DMS efforts to include removal of end of-life software/hardware within simulator systems and move to a modular, common open system architecture that is sustainable and cyber-resilient. Implement requirements and standards defined under the Simulator Common Architecture Requirements and Standards (SCARS) initiative.

The C-130H AMP Increment 1 program currently modifies up to 176 C-130H aircraft consisting of H3s, H2.5s, H2s,H1s and LC-130H aircraft. The modification effort consists of 4 prototype aircraft representative of variations in the mission designs and required for accomplishment of the Engineering and Manufacturing Development (EMD) phase with the remaining aircraft modified in the production phase.

This funding includes Rapid Global Mobility (RGM) platform related activities including but not limited to prototyping, capability development, process activities, planning analysis and systems engineering activities.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver C-130H weapon system capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F. The program may also include any Contractor Manpower Equivalent (CME)/A&AS support deemed necessary to support the program objectives.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: C-130H AMP Increment 1	2.894	5.864	0.000	-	0.000
Description: Executing Engineering and Manufacturing Development (EMD) phase activities.					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401115F / *C-130 Airlift Squadron*	**Project (Number/Name)** 675248 / *C-130H Avionics Modernization Program (AMP) Increment 1*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
FY 2019 Plans: Continuation of EMD activities to include but are not limited to, design, integration, development and operational test, studies and risk reduction efforts, spares, type 1 training and C-130H aircrew and maintenance training systems and courseware development efforts (including Mode 5 effort for the trainers) and other efforts necessary to fulfill program requirements and development portion of Weapon System Trainers (WST). ***FY 2020 Base Plans:*** RDT&E complete by FY20. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding decreased to $0.0 (due to EMD ending in FY19).					
Accomplishments/Planned Programs Subtotals	2.894	5.864	0.000	-	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APAF 05 Line Item C13000: *C-130*	7.200	7.637	7.338	-	7.338	3.846	-	-	-	0.000	26.021
• APAF 06 Line Item 000999: *Initial Spares/Repair Parts*	2.814	0.616	-	-	-	-	-	-	-	0.000	3.430

Remarks

C-130H AMP Increment 1 Procurement funding began in FY18.

D. Acquisition Strategy

C-130H AMP Increment 1 acquisition strategy (30 Sept 2015) was to conduct a competitive small business set aside source selection for ADS-B Out and Enhanced Mode S followed by a Federal Acquisition Regulation (FAR) Part 15 contract award. The EMD contract was awarded in 2nd quarter FY17. Preliminary Design Review (PDR) completed 3rd quarter FY17 and Critical Design Review (CDR) completed 4th quarter FY17. Milestone C approved 4th quarter FY18 (23 Jul 2018). Current efforts continue to focus on the execution of Engineering and Manufacturing Development (EMD) of the Weapon Systems Trainer (WST).

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401115F / *C-130 Airlift Squadron*	**Project (Number/Name)** 675248 / *C-130H Avionics Modernization Program (AMP) Increment 1*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
C-130H AMP Increment 1 EMD Contract	TBD	TBD : TBD	-	-		0.500	Jan 2019	-		-		-	0.000	0.500	0.500
C-130H AMP Increment 1 Trainers/Training	TBD	TBD : TBD	-	-		5.000	Jan 2019	-		-		-	0.000	5.000	5.000
		Subtotal	-	-		5.500		-		-		-	0.000	5.500	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
C-130H AMP Increment 1 Development Flight Test	Various	413 Flight Test Squadron : FL	-	0.965	Feb 2018	-		-		-		-	0.000	0.965	0.965
		Subtotal	-	0.965		-		-		-		-	0.000	0.965	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
C-130H AMP Increment 1 PMA Contractor Services	Various	Not Specified : TBD	-	1.929	Mar 2018	0.364	Mar 2019	-		-		-	0.000	2.293	2.293
		Subtotal	-	1.929		0.364		-		-		-	0.000	2.293	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	2.894		5.864		-		-		-	0.000	8.758	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401115F / *C-130 Airlift Squadron*	**Project (Number/Name)** 675248 / *C-130H Avionics Modernization Program (AMP) Increment 1*

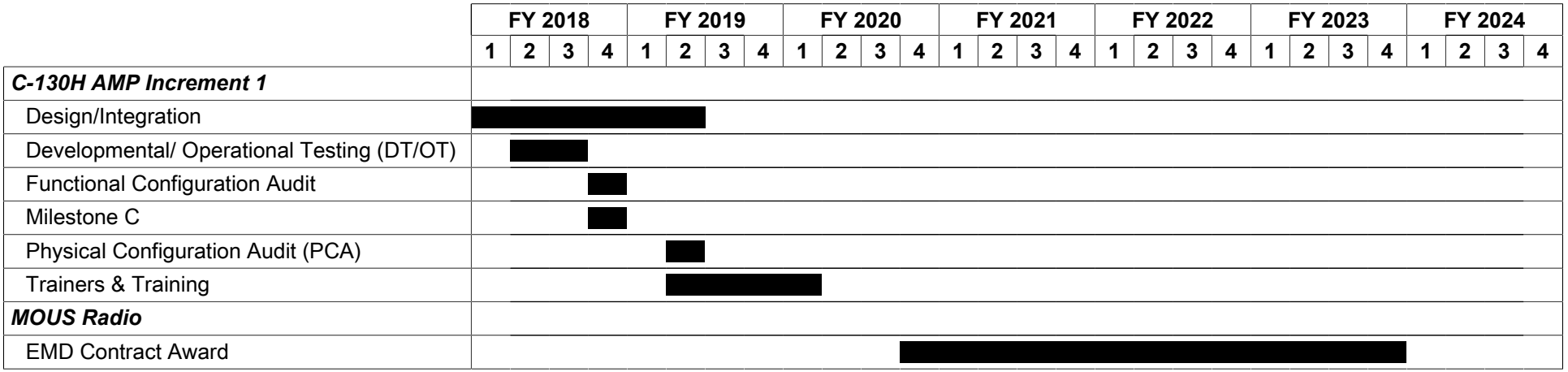

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401115F / *C-130 Airlift Squadron*	**Project (Number/Name)** 675248 / *C-130H Avionics Modernization Program (AMP) Increment 1*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
C-130H AMP Increment 1				
Design/Integration	1	2018	2	2019
Developmental/ Operational Testing (DT/OT)	2	2018	3	2018
Functional Configuration Audit	4	2018	4	2018
Milestone C	4	2018	4	2018
Physical Configuration Audit (PCA)	2	2019	2	2019
Trainers & Training	2	2019	1	2020
MOUS Radio				
EMD Contract Award	4	2020	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0401115F / *C-130 Airlift Squadron*	Project (Number/Name) 675250 / *C-130H Avionics Modernization Program (AMP) Increment 2*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675250: *C-130H Avionics Modernization Program (AMP) Increment 2*	-	7.325	100.124	124.625	0.000	124.625	113.473	33.807	0.000	0.006	0.000	379.360
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The C-130H AMP Increment 2 upgrades the C-130H fleet with comprehensive avionics and cockpit modernization which replaces aging unreliable equipment and adds combat capability enhancements. It also addresses select obsolescence and Diminishing Manufacturing Sources (DMS) issues with solutions that may include life of type buys or bridge buys. DMS efforts to include removal of end-of-life software/hardware within simulators systems and move to a modular, common open system architecture that is sustainable and cyber-resilient. Implement requirements and standards defined under the Simulator Common Architecture Requirements and Standards (SCARS) initiative.

RDT&E efforts include but are not limited to software development, design, integration, development and operational test, studies and risk reduction efforts, trial kit buy and installation, technical order development validation and verification, peculiar support equipment and spares in support of trial kit installs, SIL development, type 1 training, and C-130H aircrew and maintenance training systems and courseware development efforts and other efforts required to fulfill requirements.

The C-130H AMP Increment 2 program modifies up to 176 aircraft consisting of H3s, H2.5s, H2s,H1s and LC-130H aircraft. The modification effort will have 4 prototype aircraft representative of variations in the mission designs and required for accomplishment of the Engineering and Manufacturing Development (EMD) phase with the remaining aircraft modified in the production phase.

This funding includes Rapid Global Mobility (RGM) platform related activities including but not limited to prototyping, capability development, process activities, planning analysis and systems engineering activities.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver C-130H weapon system capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F. The program may also include any Contractor Manpower Equivalent (CME)/A&AS support deemed necessary to support the program objectives.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: C-130H Avionics Modernization Program (AMP) Increment 2	7.325	100.124	124.625	-	124.625

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401115F / *C-130 Airlift Squadron*	**Project (Number/Name)** 675250 / *C-130H Avionics Modernization Program (AMP) Increment 2*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Description: Refine and complete the requirements definition phase of the program, followed by integration planning and the Engineering and Manufacturing Development (EMD) phase activities. ***FY 2019 Plans:*** Milestone B, contract award and execution of EMD to include but are not limited to software development, design, integration, development and operational test, studies and risk reduction efforts, trial kit buy and installation, technical order development validation and verification, peculiar support equipment and spares in support of trial kit installs, SIL development, type 1 training, and C-130H aircrew and maintenance training systems and courseware development efforts and other efforts required to fulfill program requirements. ***FY 2020 Base Plans:*** Continuation of EMD activities to include but are not limited to software development, design, integration, development and operational test, studies and risk reduction efforts, trial kit buy and installation, technical order development validation and verification, peculiar support equipment and spares in support of trial kit installs, SIL development, type 1 training, and C-130H aircrew and maintenance training systems and courseware development efforts and other efforts required to fulfill program requirements. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding increased $24.501M due to the continuation of EMD and development testing.					
Accomplishments/Planned Programs Subtotals	7.325	100.124	124.625	-	124.625

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APAF 05 Line Item C13000: *C-130*	-	-	-	-	-	61.297	164.524	229.971	165.000	Continuing	Continuing
• APAF 06 Line Item 000999: *Initial Spares/Repair Parts*	-	-	-	-	-	4.900	11.027	15.096	15.368	Continuing	Continuing

Remarks

The C-130H Avionics Modernization Program (AMP) Increment 2 procurement funding begins in FY21.

D. Acquisition Strategy

C-130H AMP Increment 2 acquisition strategy intends to conduct a full and open competitive source selection followed by contract award. Current efforts are primarily focused on the Engineering and Manufacturing Development (EMD) source selection. The current schedule reflects EMD contract award in 3rd quarter FY19.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401115F / *C-130 Airlift Squadron*	**Project (Number/Name)** 675250 / *C-130H Avionics Modernization Program (AMP) Increment 2*

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401115F / *C-130 Airlift Squadron*	**Project (Number/Name)** 675250 / *C-130H Avionics Modernization Program (AMP) Increment 2*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
C-130H AMP Increment 2 EMD Contract	C/Various	TBD : TBD	-	-		95.696	Dec 2018	111.345	Nov 2019	-		111.345	Continuing	Continuing	207.041
		Subtotal	-	-		95.696		111.345		-		111.345	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
C-130H AMP Increment 2 Development Testing	PO	TBD : TBD	-	0.171	Sep 2017	0.699	Mar 2019	8.700	Mar 2020	-		8.700	Continuing	Continuing	9.570
		Subtotal	-	0.171		0.699		8.700		-		8.700	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
C-130H AMP Increment 2 PMA Contractor Services	Various	Not Specified : TBD	-	7.054	Mar 2018	3.629		4.480	Mar 2020	-		4.480	Continuing	Continuing	15.163
C-130H AMP Increment 2 PMA - Government Cost	Various	Not Specified : TBD	-	0.100	Oct 2017	0.100	Nov 2018	0.100	Oct 2019	-		0.100	0.000	0.300	0.300
		Subtotal	-	7.154		3.729		4.580		-		4.580	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	7.325		100.124		124.625		-		124.625	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401115F / *C-130 Airlift Squadron*	**Project (Number/Name)** 675250 / *C-130H Avionics Modernization Program (AMP) Increment 2*

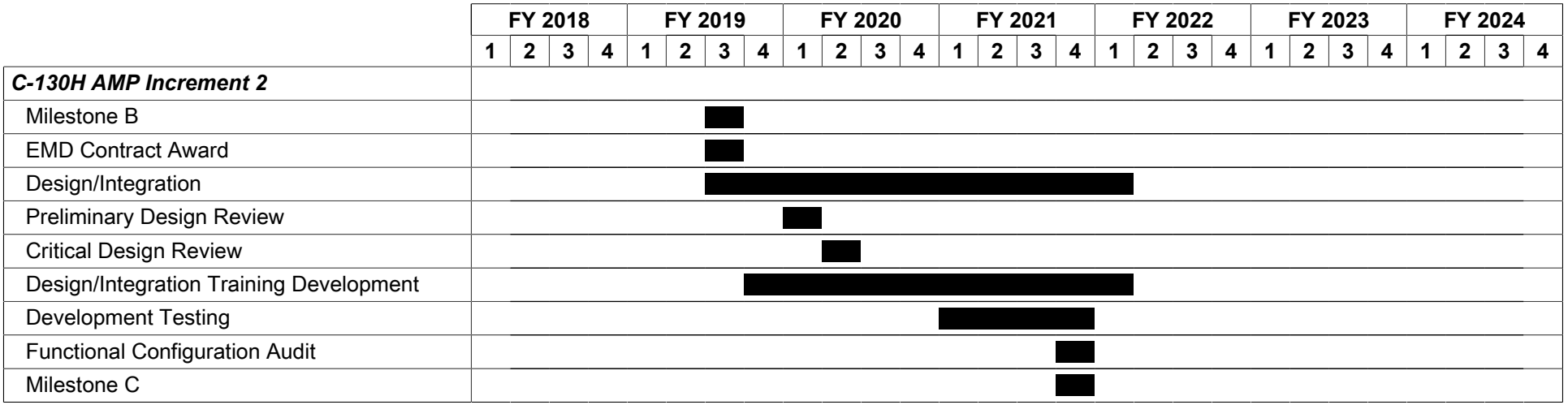

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401115F / *C-130 Airlift Squadron*	**Project (Number/Name)** 675250 / *C-130H Avionics Modernization Program (AMP) Increment 2*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
C-130H AMP Increment 2				
Milestone B	3	2019	3	2019
EMD Contract Award	3	2019	3	2019
Design/Integration	3	2019	1	2022
Preliminary Design Review	1	2020	1	2020
Critical Design Review	2	2020	2	2020
Design/Integration Training Development	4	2019	1	2022
Development Testing	1	2021	4	2021
Functional Configuration Audit	4	2021	4	2021
Milestone C	4	2021	4	2021

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0401119F / *C-5 Airlift Squadrons (IF)*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	11.433	25.071	10.223	0.000	10.223	36.288	22.634	0.672	0.000	0.000	106.321
671307: *C-5 REPLACE MULTIFUNCT CONTROL AND DISPLAY (RMCD)*	-	0.000	0.000	10.223	0.000	10.223	36.288	22.634	0.672	0.000	0.000	69.817
675358: *C-5 Mission Computer-Mission Sys Equip-Weather Radar*	-	4.797	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.797
675359: *C-5M Communication, Navigation, Surveillance/Air Traffic Management (CNS/ATM)*	-	6.636	25.071	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	31.707

Note

This program, BA 7, PE 0401119F, project 671307, C-5 Replace Multi-Functional Controls and Displays (C-5), is a new start.

A. Mission Description and Budget Item Justification

The C-5M operates across the entire range of military operations. It is the only aircraft capable of carrying 100% of certified air-transportable cargo and includes a dedicated passenger compartment enabling commanders to have troops and their equipment arrive in an area of operation simultaneously when national security concerns demand fast force closure. C-5M missions include strategic airlift of cargo and passengers as well as emergency aeromedical evacuation (AE). The aircraft must perform these missions throughout the worldwide air traffic control environment with the proper equipment to operate in FAA/ICAO controlled airspace. Additionally, C-5M aircraft must operate at night, in adverse weather conditions, and in Chemical, Biological, Radiological, Nuclear (excluding electromagnetic pulse in accordance with Joint Requirements Oversights Council (JROC) approved/validated the C-5 RERP ORD 14 Aug 01, see Appendix B, Ref YY, page 11, para 4.3.1), and High Explosive (CBRNE) environments.

C-5M communication, navigation, surveillance/air traffic management (CNS/ATM) program is a comprehensive effort to ensure appropriate CNS/ATM system design architectures are developed and equipment is installed on the C-5M to allow aircraft operation in accordance with civil airspace access mandates for both the US national airspace system (NAS) and international civil airspace. Also, the program will add equipment to meet outstanding National Security Agency mandates for encryption of voice communications. The C-5M CNS/ATM program ensures system standardization and interoperability with other DoD systems to the maximum extent possible and directly supports airworthiness certification of the C-5M. CNS/ATM requirements include, but are not limited to, capabilities such as automatic dependence surveillance-broadcast out (ADS-B Out), identification friend or foe (IFF) mode 5, satellite communication equipment replacement, and beyond line-of-sight voice radio replacement. It is anticipated equipment will be predominately commercial off-the-shelf or non-developmental items.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401119F / *C-5 Airlift Squadrons (IF)*

The C-5M core mission computer (CMC)/weather radar (WxR) program is a comprehensive sustainment modification to mitigate the obsolescence of the current CMC and WxR. This effort centers around modifying the current mission computer to obtain sufficient capacity/capability to support integration of new system capabilities with margin for growth by upgrading module cards and correcting any mission essential deficiencies identified during development. Also, the effort includes replacement of the weather radar with a commercial off-the-shelf weather radar. Mission systems equipment includes, but is not limited to, a redesign of the C-5M lavatory system. Examples of other mission systems equipment include troop seats, crew entry door and ladder, and interior trim.

C-5M Replace Multi-function Controls and Displays (RMCD) program helps to maintain aircraft availability and increased situational awareness though a new Multi Function Display Unit (MFDU)replace the current 20+ year MFDU design; current equipment is experiencing severe diminishing manufacturing source (DMS) issues. Additionally, a charging solution for the Electronic Flight Bag (EFB) will provide complementary situational awareness for operational mission support. The current generation of displays and controls supporting services used on the C-5M will no longer be repairable beginning in 2022 for MFDU. Without this modification, the C-5M will be unable to support the National Defense Strategy, AF Strategic Master Plan, Geographical Combatant Command Operational Plans.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver C-5M weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F and 605833F.

Available funds will be used for program management administration, studies and analysis, risk reduction efforts, Advisory and Assistance Services, change orders, and other government costs such as travel, directorate support, government furnished equipment (GFE), and over and above costs. Funding may also be used to address Diminishing Manufacturing Sources (DMS) through studies and analysis, bridge buys, life-of-type buys, etc.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force					Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*		R-1 Program Element (Number/Name) PE 0401119F / *C-5 Airlift Squadrons (IF)*			
B. Program Change Summary ($ in Millions)	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**
Previous President's Budget	22.758	25.071	0.000	0.000	0.000
Current President's Budget	11.433	25.071	10.223	0.000	10.223
Total Adjustments	-11.325	0.000	10.223	0.000	10.223
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	-11.000	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	-0.323	0.000			
• Other Adjustments	-0.002	0.000	10.223	0.000	10.223

Change Summary Explanation

FY 2018 funds includes Other Adjustment for -$.002 million for a C-5 AMP Upward Adjustment for an invoice against cancelled year funding.

FY 2019 funds include $0.051 million withhold pending final determination of Penalty for Cost Overruns in accordance with PL 114-92 as amended by PL 115 -91 section 825(a).

FY 2020 funds include $10.223 million for RMCD New Start Program.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0401119F / *C-5 Airlift Squadrons (IF)*	Project (Number/Name) 671307 / *C-5 REPLACE MULTIFUNCT CONTROL AND DISPLAY (RMCD)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
671307: *C-5 REPLACE MULTIFUNCT CONTROL AND DISPLAY (RMCD)*	-	0.000	0.000	10.223	0.000	10.223	36.288	22.634	0.672	0.000	0.000	69.817
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 7, PE 0401119F, project 671307, C-5 Replace Multi-Functional Controls and Displays (C-5), is a new start.

A. Mission Description and Budget Item Justification

C-5M Replace multi-function controls and display (RMCD) program is a comprehensive effort to ensure appropriate RMCD Line Replaceable Units (LRU) are developed and installed on the C-5M allowing aircraft operation in accordance with civil airspace access mandates for both US national airspace system (NAS) and international civil airspace. The C-5M RMCD program ensures system standardization and interoperability with other DoD systems to the maximum extent possible and directly supports airworthiness certification. The purpose of the program is to identify a suitable charging solution for Electronic Flight Bag (EFB), and replacement/alternatives to the existing multi-function control display unit (MCDU) and multi-function display unit (MFDU) LRUs while maintaining existing interfaces to legacy equipment and providing for future growth opportunities. Operational Flight Programs (OFP) updates/aggregation are required to support the latest aircraft display technologies and will be designed to ensure seamless integration into the platform. Aircraft wiring will be replaced/upgraded as required. Use of mixed displays (current and new) is not permissible due to human factors considerations. It is anticipated equipment will be predominately commercial off-the-shelf or non-developmental items.

The RMCD program is a comprehensive sustainment modification to mitigate the obsolescence of the current control and display units. This effort centers around modifying the current display units to obtain sufficient capacity/capability to support integration of new system capabilities with margin for growth by upgrading displays and correcting any mission essential deficiencies identified during development, including addition of a charging solution for EFB. This modification may include software non-recurring engineering (NRE), data, cyber security, testing, installation, spares, systems integration lab (SIL), Interim Contractor Support (ICS), program support, etc.

The modification helps to maintain aircraft availability as the new multifunctional controls and displays replaces the current controls and displays, which are experiencing severe diminishing manufacturing source (DMS) issues. Failure to upgrade the displays to support aircraft availability will create a significant operational impact to the support of Geographic Combatant Command (GCCs) and maintaining U.S. National objectives. Further, Diminishing Manufacturing Source (DMS) issues will be resolved to support continued operations through studies and analysis, risk reduction efforts, bridge buys, life-of-type buys, development, and redesign efforts.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver C-5M weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605833F and 0605898F.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401119F / *C-5 Airlift Squadrons (IF)*	**Project (Number/Name)** 671307 / *C-5 REPLACE MULTIFUNCT CONTROL AND DISPLAY (RMCD)*

Available funds may be used for program management administration, studies and analysis, risk reduction efforts, Advisory and Assistance Services, change orders, and other government costs such as travel, directorate support, government furnished equipment (GFE), and over and above costs. Funding may also be used to address Diminishing Manufacturing Sources (DMS) through studies and analysis, bridge buys, life-of-type buys, etc.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: C-5M Replace Multi-Functional Controls and Displays	-	0.000	10.223
Description: Replace Multifunctional Controls and Displays replacement will enable the C-5M to achieve wartime mission requirements by maintaining fleet availability (mission capable rate) and program management administration (PMA). ***FY 2019 Plans:*** Not an active program in FY19 ***FY 2020 Plans:*** $10.223 million is New Start in FY20 Award EMD Contract for hardware and software design, development, integration, data management, systems engineering, program management, and spares. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** New Start in FY20			
Accomplishments/Planned Programs Subtotals	-	0.000	10.223

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Acquisition Strategy (AS) for the RMCD has not been determined/approved as of January 2019. The Program Office anticipates completion of Early Strategy & Issues Session (ESIS) by February 2019, with the Acquisition Strategy Plan (ASP) completion by April 2019. The strategy is to procure the display units,integrate and test those components, and install on two (2) EMD aircraft.

Program Office anticipates that the contract type will be that of Cost Plus Incentive Fee (CPIF) with some Firm Fixed Price (FFP) elements.

Program office will consider the use commercial components.
The MCDU may require Non-Recurring Engineering (NRE).
The MFDU may require Sole Source (SS) to Lockheed, who holds the Data Rights.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401119F / *C-5 Airlift Squadrons (IF)*	**Project (Number/Name)** 671307 / *C-5 REPLACE MULTIFUNCT CONTROL AND DISPLAY (RMCD)*

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401119F / *C-5 Airlift Squadrons (IF)*	**Project (Number/Name)** 671307 / *C-5 REPLACE MULTIFUNCT CONTROL AND DISPLAY (RMCD)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
RMCD hardware/software design, development, integration, data management, technical data rights, systems engineering, program management, and spares	SS/CPAF	TBD : Marietta, GA	-	-		-		8.771	Apr 2020	-		8.771	Continuing	Continuing	52.649
		Subtotal	-	-		-		8.771		-		8.771	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Other Govt Test and SIL	Various	TBD : TBD	-	-		-		-		-		-	0.000	0.000	-
		Subtotal	-	-		-		-		-		-	0.000	0.000	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Other Govt	PO	AFLCMC/WLS : WPAFB, OH	-	-		-		1.452		-		1.452	Continuing	Continuing	-
		Subtotal	-	-		-		1.452		-		1.452	Continuing	Continuing	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		0.000		10.223		-		10.223	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401119F / *C-5 Airlift Squadrons (IF)*	**Project (Number/Name)** 671307 / *C-5 REPLACE MULTIFUNCT CONTROL AND DISPLAY (RMCD)*

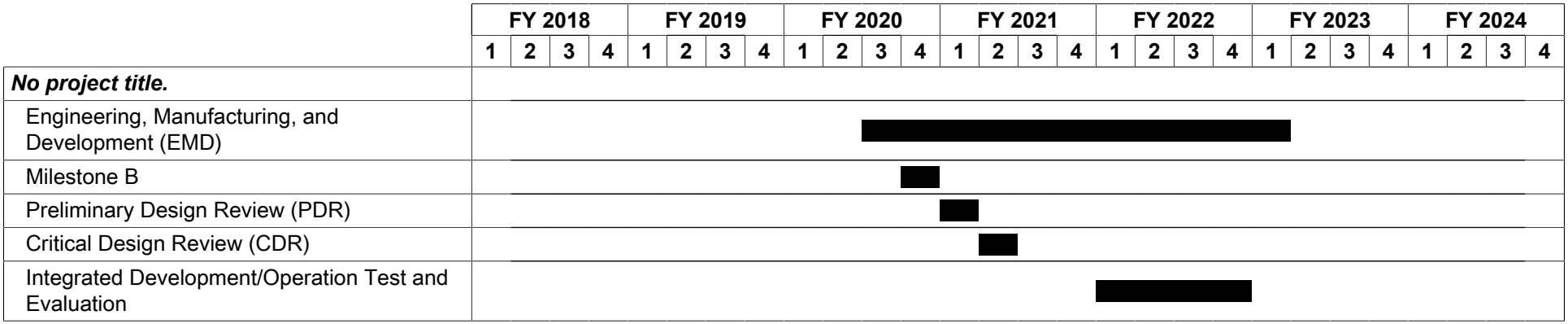

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401119F / *C-5 Airlift Squadrons (IF)*	**Project (Number/Name)** 671307 / *C-5 REPLACE MULTIFUNCT CONTROL AND DISPLAY (RMCD)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
No project title.				
Engineering, Manufacturing, and Development (EMD)	3	2020	1	2023
Milestone B	4	2020	4	2020
Preliminary Design Review (PDR)	1	2021	1	2021
Critical Design Review (CDR)	2	2021	2	2021
Integrated Development/Operation Test and Evaluation	1	2022	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0401119F / *C-5 Airlift Squadrons (IF)*	Project (Number/Name) 675358 / *C-5 Mission Computer-Mission Sys Equip-Weather Radar*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675358: *C-5 Mission Computer-Mission Sys Equip-Weather Radar*	-	4.797	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.797
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The C-5M core mission computer (CMC) and weather radar (WxRadar) replacement program is a comprehensive, permanent sustainment modification, as described in validated requirements per AMC AF Form 1067s 11-152 and 11-153, to mitigate the obsolescence of the current CMC and WxRadar. This effort modifies the current CMC to obtain sufficient capacity/capability to support integration of the WxRadar with margin for growth to accommodate future requirements. This includes requirements to meet calendar year 2020 FAA Automatic Dependent Surveillance-Broadcast (ADS-B) Out and Communication, Navigation, Surveillance/Air Traffic Management (CNS/ATM) requirements. Mission systems equipment includes, but is not limited to, a redesign of the C-5M lavatory system. Examples of other mission systems equipment include troop seats, crew entry door and ladder, and interior trim.

The CMC/WxRadar modification is necessary to keep the C-5M worldwide deployable. This effort replaces the APS-133 WxRadar, resolving severe diminishing manufacturing source (DMS) issues, using the Rockwell Collins WXR-2100 commercial off-the-shelf WxRadar, which is common to other aircraft platforms, and provides the same capability as the APS-133. The effort also replaces the current core processing module (CPM) cards in the CMC with new Honeywell CPM II cards, providing additional processing speed and throughput capacity.

The CMC/WxRadar program is the baseline for all future modifications to the C-5M. The modification helps to maintain aircraft availability as the current APS-133 WxRadar and current CPM cards are both facing severe diminishing manufacturing source (DMS) issues. Failure to upgrade the WxRadar and CMC to support calendar year 2020 CNS/ATM mandates and a new weather radar will create a significant operational impact.

Available funds will be used for program management administration, studies and analysis, risk reduction efforts, Advisory and Assistance Services, change orders, and other government costs such as travel, directorate support, government furnished equipment (GFE), and over and above costs. Funding may also be used to address Diminishing Manufacturing Sources (DMS) through studies and analysis, bridge buys, life-of-type buys, etc.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: C-5M Mission Computer / Weather Radar Program	4.797	0.000	-
Description: Core mission computer modification and weather radar replacement will enable the C-5M to achieve wartime mission requirements by maintaining fleet availability (mission capable rate) and program management administration (PMA).			
FY 2019 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401119F / *C-5 Airlift Squadrons (IF)*	**Project (Number/Name)** 675358 / *C-5 Mission Computer-Mission Sys Equip-Weather Radar*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Program complete. N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	4.797	0.000	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APAF 05 Line Item C00500: *C-5*	15.613	28.353	32.422	-	32.422	15.365	6.928	1.007	-	0.000	99.688
• APAF 06 Line Item 000999: *Initial Spares*	1.952	0.647	0.000	-	0.000	0.000	0.000	0.000	-	0.000	2.599
• APAF 07 Line Item 000075: *Other Production*	0.000	0.000	0.000	-	0.000	0.000	0.000	0.000	-	0.000	0.000

Remarks

D. Acquisition Strategy

The acquisition strategy for this project considered every opportunity to use commercial components to modernize the C-5M core mission computer and weather radar and maintain aircraft availability in support of mobility missions worldwide. The strategy is for the prime contractor, Lockheed Martin Aero (LMA), to procure the core mission computer cards and weather radar, integrate and test those components, and install on two (2) EMD aircraft. The sole-source contract is predominately CPIF (Cost Plus Incentive Fee) with some FFP (Firm Fixed Price) elements.

Mission Systems Equipment program: The mission systems equipment redesign requires RDT&E funding for commercial off-the-shelf (COTS) proofing. Funds are required for validation and verification of the lavatory design and installation. The Mission Systems Equipment contract method was competitive through the Defense Technical Information Center (DTIC). Wyle Science, Technical, and Engineering Group was the selected source, and the contract type is Cost Plus Fixed Fee (CPFF).

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401119F / *C-5 Airlift Squadrons (IF)*	**Project (Number/Name)** 675358 / *C-5 Mission Computer-Mission Sys Equip-Weather Radar*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Core Mission Computer / Weather Radar Program Hardware/Software Design, Development, Integration, Data Management, Technical Data Rights, Systems Engineering, and Program Management	SS/TBD	Various : Varios	-	2.391		-		-		-		-	0.000	2.391	85.539
		Subtotal	-	2.391		-		-		-		-	0.000	2.391	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Core Mission Computer / Weather Radar Program Trainers & Simulators	SS/ Various	Lockheed Martin Aero : Marietta, GA	-	2.406		-		-		-		-	0.000	2.406	2.599
Core Mission Computer / Weather Radar Program Other Govt Costs (OGC)	Various	Various : TBD	-	0.000		-		-		-		-	0.000	0.000	3.390
		Subtotal	-	2.406		-		-		-		-	0.000	2.406	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Core Mission Computer / Weather Radar Program Developmental and Operational Test and Evaluation	Various	Various : NV	-	0.000		-		-		-		-	0.000	0.000	7.452
		Subtotal	-	0.000		-		-		-		-	0.000	0.000	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401119F / *C-5 Airlift Squadrons (IF)*	**Project (Number/Name)** 675358 / *C-5 Mission Computer-Mission Sys Equip-Weather Radar*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Core Mission Computer / Weather Radar Program PMA Government Costs	Various	AFLCMC/WLS : Dayton, OH	-	0.000		-		-		-		-	0.000	0.000	8.283
		Subtotal	-	0.000		-		-		-		-	0.000	0.000	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	4.797		0.000		-		-		-	0.000	4.797	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401119F / *C-5 Airlift Squadrons (IF)*	**Project (Number/Name)** 675358 / *C-5 Mission Computer-Mission Sys Equip-Weather Radar*

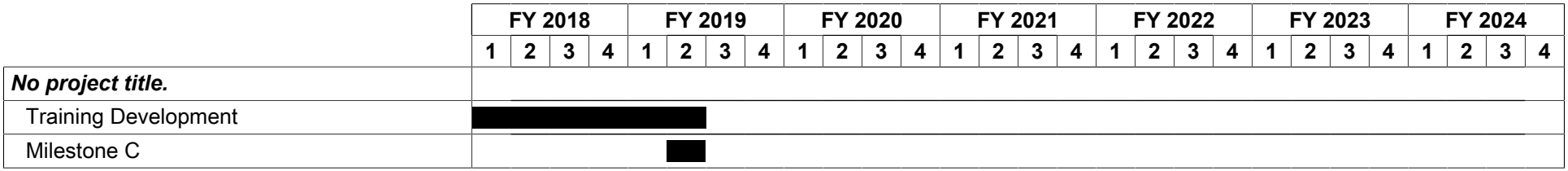

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401119F / *C-5 Airlift Squadrons (IF)*	**Project (Number/Name)** 675358 / *C-5 Mission Computer-Mission Sys Equip-Weather Radar*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
No project title.				
Training Development	1	2018	2	2019
Milestone C	2	2019	2	2019

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0401119F / *C-5 Airlift Squadrons (IF)*	Project (Number/Name) 675359 / *C-5M Communication, Navigation, Surveillance/Air Traffic Management (CNS/ ATM)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675359: *C-5M Communication, Navigation, Surveillance/Air Traffic Management (CNS/ATM)*	-	6.636	25.071	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	31.707
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

C-5M communication, navigation, surveillance/air traffic management (CNS/ATM) program is a comprehensive effort to ensure appropriate CNS/ATM system design architectures are developed and equipment is installed on the C-5M to allow aircraft operation in accordance with civil airspace access mandates for both the US national airspace system (NAS) and international civil airspace. Also, the program will add equipment to meet outstanding National Security Agency mandates for encryption of voice communications. The C-5M CNS/ATM program ensures system standardization and interoperability with other DoD systems to the maximum extent possible and directly supports airworthiness certification of the C-5M. CNS/ATM requirements include, but are not limited to, capabilities such as automatic dependence surveillance-broadcast out (ADS-B Out), identification friend or foe (IFF) mode 5, satellite communication equipment replacement, and beyond line-of-sight voice radio replacement. It is anticipated equipment will be predominately commercial off-the-shelf or non-developmental items.

The current ARC-210 radio for VHF voice communications is facing diminishing manufacturing source (DMS) supply issues and additionally will no longer be capable of providing secure voice communications due to the development of new crypto algorithms. Addition of next generation ARC-210 radios with embedded Integrated Waveform (IW) and Second-generation Anti-jam Tactical UHF Radio for NATO (SATURN) and associated cryptologic equipment will enable the C-5M to meet NSA mandates for secure communications and allow aircrews to continue to communicate securely over VHF, UHF, HF, or MILSATCOM.

The current generation of satellites that support services used on the C-5M to provide oceanic controller/pilot data link communications (CPDLCs) to air traffic control and aircraft communications addressing and reporting system (ACARS) beyond-line-of-sight command and control messages will no longer be functional after 2016. The next generation of satellites will accommodate legacy C-5M SATCOM equipment for an interim period of time to allow for integration of upgraded SATCOM equipment compatible with this satellite constellation. Without this modification, the C-5M will be unable to fly oceanic tracks and will not be able to meet aircraft separation distance requirements for civil airspace access.

Automatic Dependent Surveillance-Broadcast Out (ADS-B Out) is a next generation surveillance technology that transitions key aspects of air traffic control from terrestrial based technologies to satellite enabled technologies to provide controllers a more accurate picture of aircraft positioning. ADS-B Out will allow aircraft to provide continuous broadcast of aircraft position to both controllers and other aircraft equipped with ADS-B In capable avionics. International mandates for ADS-B Out for civil airspace access call for equipage by 2020.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401119F / *C-5 Airlift Squadrons (IF)*	**Project (Number/Name)** 675359 / *C-5M Communication, Navigation, Surveillance/Air Traffic Management (CNS/ ATM)*

Available funds will be used for program management administration, studies and analysis, risk reduction efforts, Advisory and Assistance Services, change orders, and other government costs such as travel, directorate support, government furnished equipment (GFE), and over and above costs. Funding may also be used to address Diminishing Manufacturing Sources (DMS) through studies and analysis, bridge buys, life-of-type buys, etc.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver C-5M weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F and 605833F.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: C-5M CNS/ATM	6.636	25.071	-
Description: C-5M CNS/ATM program will install multiple aircraft avionic equipment pieces to enable the C-5M to meet multiple NSA encryption and international/national airspace access mandates while mitigating diminishing manufacturing source issues. ***FY 2019 Plans:*** CNS/ATM system design supports incorporation of ARC-210 Gen V radios, SATCOM replacement equipment, ADS-B Out, and IFF mode 5 into the C-5M. Efforts will include software design as well as hardware analysis for compatibility with existing C-5M system architecture. Ensure test cases are prepared and ready to support the start of qualification testing. FY19 funding supports completion of Development Test & Evaluation (DT&E), Operational Test & Evaluation (OT&E), and delivery of Tech Data Package (TDP). ***FY 2019 to FY 2020 Increase/Decrease Statement:*** EMD ends in FY19. No funds in FY20.			
Accomplishments/Planned Programs Subtotals	6.636	25.071	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APAF 05 Line Item C00500: *C-5*	0.000	28.613	32.386	-	32.386	32.743	22.745	30.458	26.475	0.000	173.420
• APAF 06 Line Item 000999: *Initial Spares*	0.000	2.108	2.053	-	2.053	0.409	0.000	1.972	2.028	0.000	8.570
• APAF 07 Line Item 000075: *Other Production*	0.000	0.000	0.585	-	0.585	3.644	0.000	0.000	3.295	0.000	7.524

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401119F / *C-5 Airlift Squadrons (IF)*	**Project (Number/Name)** 675359 / *C-5M Communication, Navigation, Surveillance/Air Traffic Management (CNS/ ATM)*

D. Acquisition Strategy

CNS/ATM program: Engineering and Manufacturing Development (EMD) for incorporation of the ARC-210 Gen V radio, SATCOM replacement equipment, ADS-B Out, and IFF mode 5 into the C-5M began in Dec 2016. The acquisition strategy for this program will consider every opportunity to use commercial components to modernize the C-5M CNS/ATM equipment to meet CY2020 mandates for global civil airspace access. The strategy is for the prime contractor, Lockheed Martin Aero (LMA), to procure CNS/ATM equipment, develop software, test and integrate those components, and install on two (2) EMD aircraft. The equipment integration will require RDT&E funding for commercial off-the-shelf and non-developmental item proofing.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401119F / *C-5 Airlift Squadrons (IF)*	**Project (Number/Name)** 675359 / *C-5M Communication, Navigation, Surveillance/Air Traffic Management (CNS/ ATM)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CNS/ATM hardware/ software design, development, integration, data management, technical data rights, systems engineering, program management, and spares	Various	Lockheed Martin Aero : Marietta, GA	-	1.092	Feb 2018	16.151	Nov 2018	-		-		-	0.000	17.243	86.532
		Subtotal	-	1.092		16.151		-		-		-	0.000	17.243	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CNS/ATM Other Government Cost	Various	AFLCMC/WLS : Dayton, OH	-	2.379	Dec 2017	1.318	Nov 2018	-		-		-	0.000	3.697	4.078
CNS/ATM Training	Various	Lockheed Martin Aero : Marietta, GA	-	0.012	Feb 2018	0.000	Nov 2018	-		-		-	0.000	0.012	0.300
CNS/ATM Peculiar Support Equipment	Various	Lockheed Martin Aero : Marietta, GA	-	0.000	Feb 2018	0.000	Feb 2019	-		-		-	0.000	0.000	0.018
CNS/ATM Trainers & Simulators	Various	Various : Various	-	0.000	Feb 2018	2.120	Nov 2018	-		-		-	0.000	2.120	3.221
		Subtotal	-	2.391		3.438		-		-		-	0.000	5.829	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CNS/ATM System Test/ Qual/SIL	Various	Lockheed Martin Aero : Marietta, GA	-	1.038	Feb 2018	2.024	Nov 2018	-		-		-	0.000	3.062	8.662

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401119F / *C-5 Airlift Squadrons (IF)*	**Project (Number/Name)** 675359 / *C-5M Communication, Navigation, Surveillance/Air Traffic Management (CNS/ ATM)*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CNS/ATM System Test - Government	Various	Edwards AFB : CA	-	1.841	Feb 2018	3.123	Oct 2018	-		-		-	0.000	4.964	4.250
		Subtotal	-	2.879		5.147		-		-		-	0.000	8.026	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CNS/ATM Program Management Administration	Various	AFLCMC/WLS : Dayton, OH	-	0.131	Jun 2018	0.189	Jun 2019	-		-		-	0.000	0.320	0.949
CNS/ATM Travel	Various	AFLCMC/WLS : Dayton, OH	-	0.143	Oct 2017	0.146	Oct 2018	-		-		-	0.000	0.289	1.213
		Subtotal	-	0.274		0.335		-		-		-	0.000	0.609	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	6.636		25.071		-		-		-	0.000	31.707	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401119F / *C-5 Airlift Squadrons (IF)*	**Project (Number/Name)** 675359 / *C-5M Communication, Navigation, Surveillance/Air Traffic Management (CNS/ ATM)*

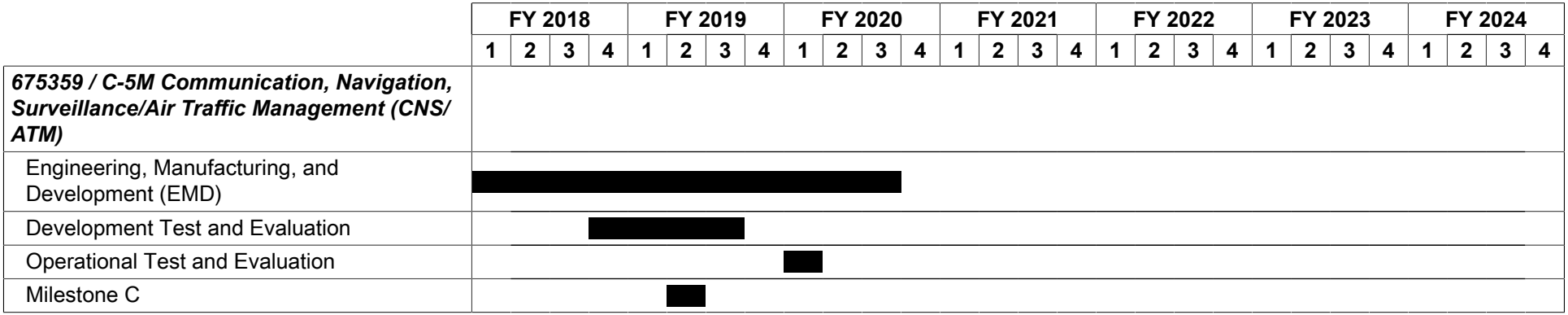

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401119F / *C-5 Airlift Squadrons (IF)*	**Project (Number/Name)** 675359 / *C-5M Communication, Navigation, Surveillance/Air Traffic Management (CNS/ ATM)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
675359 / C-5M Communication, Navigation, Surveillance/Air Traffic Management (CNS/ATM)				
Engineering, Manufacturing, and Development (EMD)	1	2018	3	2020
Development Test and Evaluation	4	2018	3	2019
Operational Test and Evaluation	1	2020	1	2020
Milestone C	2	2019	2	2019

Note

CNS/ATM will support completion of formal qualification testing, installation and functional check of hardware, design and development of aircrew and maintenance training system modification, and developmental test and evaluation.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0401130F / *C-17 Aircraft (IF)*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	21.701	48.299	25.101	0.000	25.101	10.009	9.631	25.632	0.000	0.000	140.373
672569: *C-17A Aircraft*	-	21.701	48.299	25.101	0.000	25.101	10.009	9.631	25.632	0.000	0.000	140.373
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The C-17 can perform the entire spectrum of airlift missions and is specifically designed to operate effectively and efficiently in both strategic and theater environments. Airlift provides essential flexibility when responding to contingencies on short notice anywhere in the world. It is a major element of America's national security strategy and constitutes the most responsive means of meeting mobility requirements. Specific tasks associated with the airlift mission include deployment, employment, sustaining support, retrograde, and combat redeployment. Not only can the C-17 deliver outsize cargo to austere tactical environments, but it also reduces ground time during air/land operations. The C-17 will perform its airlift mission well into this century.

C-17 Research, Development, Test & Evaluation (RDT&E) funding efforts support, but are not limited to: Aircraft performance improvements, aircraft mission execution and airspace access mandates (i.e., Communications/Navigation Improvements); flight test activities and facilities; development of solutions for obsolescence and safety of flight issues; systems engineering/program management administration support; support for avionics laboratories; software development, test and integration; block development/change management; proposal preparation for new projects; cost estimating and engineering/acquisition studies not related to requirements generation.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver C-17 weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, and 0605898F.

In FY20 the efforts are: Roll-On Conference Capsule (ROCC)and Beyond Line of Sight (BLOS) which will be covered in more detail on subsequent pages.

This funding includes Rapid Global Mobility (RGM) platform-related rapid capability development process activities including early planning, analysis and systems engineering activities which provide linkages between operational needs, system performance requirements, technology needs and opportunities, potential lifecycle costs and enabling the technical foundation for material development.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401130F / *C-17 Aircraft (IF)*

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	34.287	48.299	10.505	0.000	10.505
Current President's Budget	21.701	48.299	25.101	0.000	25.101
Total Adjustments	-12.586	0.000	14.596	0.000	14.596
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	-6.100	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-5.640	0.000			
• SBIR/STTR Transfer	-0.846	0.000			
• Other Adjustments	0.000	0.000	14.596	0.000	14.596

Change Summary Explanation

FY18 funding was reduced by $6.1M for a Congressional mark for "Excess to need". $5.64M was reprogrammed on the Omnibus. $0.846M was reduced for SBIR transfer.

FY20 funding was increased by $14.6M for BLOS development and test.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Filter Fire Mitigation (formerly referred to as Onboard Inert Gas Generation System II Filter Fire) ***Description:*** Filter Fire Mitigation is a program that redesigns the OBIGGS II shutoff valve and makes software changes to the Warning and Caution Computer (WCC). It includes support for on-going flight test, software labs, system engineering, program management and engineering/acquisition studies not related to requirements generation. ***FY 2019 Plans:*** Filter Fire program will be performing flight test in FY 2019. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** No funding changes at this time	0.000	0.862	-
Title: Replacement Heads-Up Display (RHUD) ***Description:*** The RHUD project develops, integrates and installs a new Heads Up Display (HUD)providing supportability/ improved reliability & maintainability while providing growth to support future planned capability improvements. RHUD was removed from the Common Configuration (CC) major thrust to allow management greater program visibility and oversight.	4.380	0.000	-

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401130F / *C-17 Aircraft (IF)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY 2019 Plans: RDT&E portion of the program completed in FY18. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** No funding changes			
Title: Beyond Line of Sight (BLOS) ***Description:*** Beyond Line-Of-Sight (BLOS) modernization modification is a development, integration, and retrofit program for C-17 communications. BLOS modifies and improves hardware and software for voice and data communications on the C-17. The program will modify both integrated aircraft avionics as well as back-end mission communications and could utilize both military and commercial satellite systems to extend communication ranges. The current efforts include but are not limited to Aero-I/Aero-H modernizations and Comm Mod. It includes support for on-going flight test, software labs, system engineering, program management and engineering/acquisition studies not related to requirements generation. ***FY 2019 Plans:*** In FY 2019, BLOS effort continues with significant development activity occurring according to program schedule leading up to key program milestones. ***FY 2020 Plans:*** In FY 2020, BLOS effort continues with major design milestones occurring and continued development activities. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding stream based on scheduled tasks in current program schedule which reflects a shift in FY content.	12.288	38.750	19.530
Title: Roll-On Conference Capsule (ROCC) ***Description:*** ROCC is a program to replace current Silver Bullet Capsules and includes development/design. Effort will allow US Government senior leaders and staff to work, communicate, and rest in airworthy capsules during long range missions into threat areas, with the protection of the C-17A Globemaster III's defensive systems capability. Specifically, the development phase of the ROCC, (formerly referred to as the Silver Bullet Replacement (SBR) program) will require non-recurring engineering, manufacture of the first article and testing. Support for flight test, software labs, system engineering, program management and engineering/ acquisition studies not related to requirements generation are included in the overall cost. ***FY 2019 Plans:***	5.033	8.687	5.571

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401130F / *C-17 Aircraft (IF)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Significant development activities occur to include the start of contractor development, key milestones occurring and continued development efforts to support the build of the first article. ***FY 2020 Plans:*** Development activities begin to wind down with completion of design reviews and milestone testing. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding requirement decreased to reflect latest program schedule and the completion of the bulk of development activity in FY20.			
Title: Real Time In Cockpit (RTIC) ***Description:*** RTIC Development of an air to air data transfer capability and implementation/integration of upgraded ARC-210 radios. It includes support for on-going flight test, software labs, system engineering, program management and engineering/ acquisition studies not related to requirements generation. ***FY 2019 Plans:*** The RTIC requirement is now a non-development effort for C-17 and no longer requires FY19 R&D Funding ***FY 2020 Plans:*** None ***FY 2019 to FY 2020 Increase/Decrease Statement:*** The RTIC requirement is now a non-development effort for C-17 and no longer requires FY19 R&D Funding	0.000	0.000	0.000
Title: Fixed Installation Satellite Antenna (FISA) ***Description:*** FISA includes a Satellite Communication (SATCOM) system which enables high bandwidth satellite communications, allowing for greater in flight situational awareness. It includes support for on-going flight test, software labs, system engineering, program management and engineering/acquisition studies not related to requirements generation. ***FY 2019 Plans:*** The FISA requirement is now a non-development effort for C-17 and no longer requires FY19 R&D Funding ***FY 2020 Plans:*** None ***FY 2019 to FY 2020 Increase/Decrease Statement:*** The FISA requirement is now a non-development effort for C-17 and no longer requires FY19 R&D Funding	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	21.701	48.299	25.101

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401130F / *C-17 Aircraft (IF)*

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APAF 05 Line Item C01700: *C-17A*	96.352	77.221	60.244	-	60.244	104.403	96.030	108.331	79.508	0.000	622.089
• APAF 07 Line Item C01700: *C-17A*	12.028	10.105	124.805	-	124.805	0.000	0.000	0.000	-	0.000	146.938
• APAF 06 Line Item 000999: *Initial Spares/Repair Parts*	73.248	12.850	12.103	-	12.103	47.839	21.501	9.745	7.370	0.000	184.656
• OPAF 03 Line Item 834070: *Mobility Command and Control*	-	-	10.817	-	10.817	-	-	-	-	0.000	10.817

Remarks

E. Acquisition Strategy

The C-17 Acquisition Strategy is based on several separate contracts to support the entire scope of the C-17 weapon system. Globemaster Operational Enhancement (GLOBE) is an indefinite delivery, indefinite quantity (IDIQ) contract used to purchase services and research articles (through delivery orders) to support all RDT&E with our prime contractor. In addition, purchase orders are used to support flight test activities within the projects at Edwards AFB. Additional contract vehicles could be utilized as required.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401130F / *C-17 Aircraft (IF)*	**Project (Number/Name)** 672569 / *C-17A Aircraft*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
C-17 RHUD- Replacement Heads up Display	Various	Boeing : Long Beach, CA	-	4.380	Nov 2016	-		-		-		-	Continuing	Continuing	-
C-17 Filter Fire Mitigation- (formerly referred to as Onboard Inert Gas Generating System II Filter Fire)	Various	Boeing : Long Beach, CA	-	-		0.862	Jul 2019	-		-		-	Continuing	Continuing	0.878
C-17 BLOS- Beyond Line of Sight	Various	Boeing : Long Beach, CA	-	11.963	Sep 2018	38.750	Dec 2018	19.530	Dec 2019	-		19.530	Continuing	Continuing	-
C-17 ROCC- Roll -On Conference Capsule (Formerly referred to as Silver Bullet Replacement)	C/Various	Small Business : TBD	-	5.033	Jun 2018	8.362	May 2019	5.571		-		5.571	Continuing	Continuing	-
C-17 Real Time In Cockpit (RTIC)	C/TBD	TBD : TBD	-	0.125		0.125	Jun 2019	-		-		-	Continuing	Continuing	-
C-17 Fixed Installation Satellite Antenna (FISA)	Various	Boeing : TBD	-	0.200		0.200	Jun 2019	-		-		-	Continuing	Continuing	-
		Subtotal	-	21.701		48.299		25.101		-		25.101	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	21.701		48.299		25.101		-		25.101	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401130F / *C-17 Aircraft (IF)*	**Project (Number/Name)** 672569 / *C-17A Aircraft*

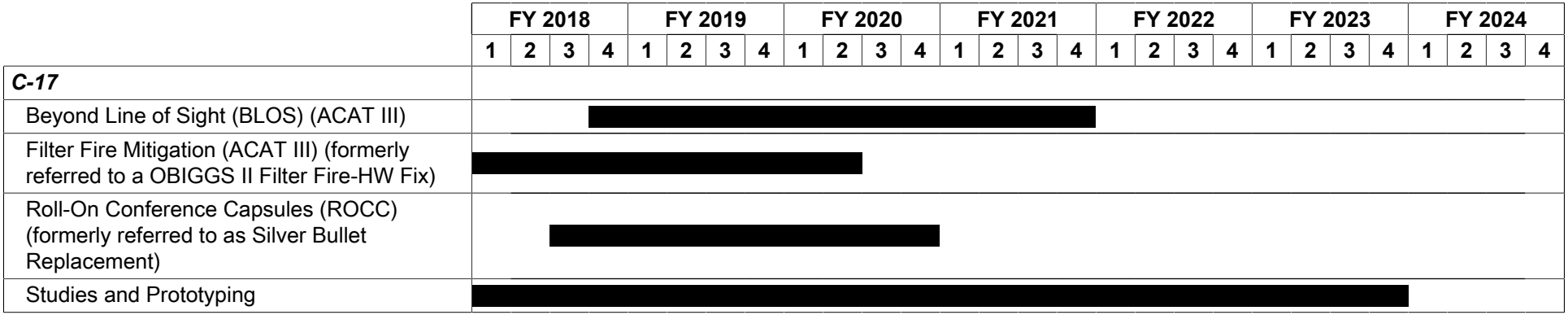

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401130F / *C-17 Aircraft (IF)*	**Project (Number/Name)** 672569 / *C-17A Aircraft*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
C-17				
Beyond Line of Sight (BLOS) (ACAT III)	4	2018	4	2021
Filter Fire Mitigation (ACAT III) (formerly referred to a OBIGGS II Filter Fire-HW Fix)	1	2018	2	2020
Roll-On Conference Capsules (ROCC) (formerly referred to as Silver Bullet Replacement)	3	2018	4	2020
Studies and Prototyping	1	2018	4	2023

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0401132F / *C-130J Program*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	24.908	15.409	8.640	0.000	8.640	13.058	14.346	14.288	13.832	Continuing	Continuing
675061: *C-130J*	0.000	24.908	15.409	8.640	0.000	8.640	13.058	14.346	14.288	13.832	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Program MDAP/MAIS Code: 220												

Note

This program, BA 7, PE 0401132F, project 675061, Mobile User Objective System (MUOS), is a new start.

A. Mission Description and Budget Item Justification

The C-130J is a medium-sized transport aircraft capable of performing a variety of combat delivery (tactical airlift) operations across a broad range of mission environments. The C-130J aircraft, with its extended (by 15 feet) fuselage, provides additional cargo carrying capacity for the USAF combat delivery mission compared with legacy C-130E/H and the C-130J (short). Special mission variants of the C-130J conduct airborne psychological operations (EC-130J), weather reconnaissance (WC-130J), search and rescue (HC-130J), and special operations (MC-130J and AC-130J). All aircraft variants must be capable of worldwide operations.

This project also provides RDT&E funding for required capabilities that are grouped as "Block" upgrades or "Capability" updates. Content/requirements for these efforts is documented in International Program Directives (IPDs) as determined through the Cooperative Systems and Software Upgrade Requirements Management (COSSURM) process or other approved C-130J Joint User Group (JUG)processes. Activities required to complete development and integration of the common-core capabilities for all United States' variants are included in this project.

This project also provides RDT&E funding for requirements that are outside of the JUG or COSSURM process. These efforts may include communication and Global Positioning Systems (GPS) system updates. The requirements are identified and concurred between the C-130J Program Office and Air Mobility Command (AMC). Requirements are documented through the C-130J Program Office approval process.

This project provides RDT&E funding for studies and risk reduction activities.

This project includes RDT&E funding for the following C-130J aircraft variants: C-130J stretch aircraft, C-130J short aircraft, EC-130J aircraft, WC-130J aircraft, HC-130J aircraft, MC-130J aircraft, and AC-130J aircraft.

This project included RDT&E funding for Rapid Global Mobility (RGM) platform related activities including, but not limited to, prototyping, capability development, process activities, planning analysis, and systems engineering activities.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401132F / *C-130J Program*

This program element may include necessary civilian pay expenses required to manage, execute, and deliver C-130J weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, and 0605898F.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	26.821	15.409	2.640	0.000	2.640
Current President's Budget	24.908	15.409	8.640	0.000	8.640
Total Adjustments	-1.913	0.000	6.000	0.000	6.000
• 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	-1.000	0.000			
• SBIR/STTR Transfer	-0.913	0.000			
• Other Adjustments	0.000	0.000	6.000	0.000	6.000

Change Summary Explanation

The FY 2018 funding was reduced -$1M from a reprogramming and -$.0913M for SBIR transfer.

The FY 2020 funding request was increased by $6.0 million to fund the completion of ADS-B for the January 2020 mandate and the next phase of Capability Management Upgrades (CMU).

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Cooperative Systems and Software Upgrade Requirements Management (COSSURM)	0.200	0.260	0.100
Description: COSSURM - Collects potential requirements for inclusion into a Block Upgrade or Capability Management Update.			
FY 2019 Plans:			

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401132F / *C-130J Program*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Continuation of COSSURM requirements review and analysis. ***FY 2020 Plans:*** Continuation of COSSURM requirements review and analysis ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY20 requirement is lower based on cooperative agreement. Effort is funded for current requirements.			
Title: Block 8.1 ***Description:*** BLOCK 8.1 Adds Identification Friend or Foe (IFF) Mode 5, Civil Data Link, Automatic Dependent Surveillance - Broadcast (ADS-B), Air Traffic Services (ATS)/Airline Operational Control (AOC) Data Link for Line of Sight (LOS) and Beyond Line of Sight (BLOS) communication, enhanced covert lighting, improved Public Address(PA) System, and Approach Procedure with Vertical guidance (APV)/ Localizer Performance with Vertical guidance (LPV) approach capability. Several avionics platforms are impacted that include Flight Management System Software, Mission Computer Software, Bus Interface Unit software, and Maintenance Management System. ***FY 2019 Plans:*** Continue development of the Block 8.1 ADS-B Out to meet the FY2020 FAA Mandate ***FY 2020 Plans:*** Continue development of the Block 8.1 ADS-B Out to meet the FY2020 FAA Mandate ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY20 requirement is lower than FY19 due to the phasing of the effort.	22.977	12.322	3.866
Title: Test & Evaluation ***Description:*** Test and evaluation planning, conduct, and support for developmental, and operational testing. ***FY 2019 Plans:*** Continuation of test support for ADS-B Out effort. ***FY 2020 Plans:*** Continuation of test planning and support for integration efforts. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY20 requirement is higher than FY19 due to testing planned for joint interoperability and regression for Blk 8.1 integration	0.436	0.324	0.587
Title: Capability Management Update (CMU)	0.385	2.053	3.387

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401132F / *C-130J Program*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: CMU's refine and build on Block upgrade modifications that improve operational effectiveness, satisfy emerging operational needs, and enhance human machine interface (HMI) to allow a workload that meets human factors standards and maintains the present crew complement. Avionics software impacted includes Flight Management System (FMS) Software, Mission Computer (MC) Software, Bus Interface Unit (BIU) software, and Maintenance Management System. ***FY 2019 Plans:*** Continuation of Common Core Development, correcting deficiencies and developing enhancements. ***FY 2020 Plans:*** Continuation of Common Core Development, correcting deficiencies and developing enhancements. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase in FY20 requirement based on identified deficiencies and corrective actions.			
Title: Other AMC Inititatives ***Description:*** C-130J initiatives/studies. ***FY 2019 Plans:*** Mission Planning software and updates continue. ***FY 2020 Plans:*** Mission Planning software and updates continue.	0.910	0.450	0.450
Title: Mobile User Objective System (MUOS) ***Description:*** Development of the new radio systems to replace existing Ultra High Frequency military satellite communications system (UHF MILSATCOM). This system will provide secure, global, beyond line-of-sight (BLOS) satellite voice connectivity utilizing the Mobile User Objective System (MUOS) satellite constellation and waveform. ***FY 2019 Plans:*** N/A ***FY 2020 Plans:*** Begin development effort of new MUOS radio systems ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Effort to begin in FY2020	-	0.000	0.250
Accomplishments/Planned Programs Subtotals	24.908	15.409	8.640

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401132F / *C-130J Program*

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APAF 05 Line Item C1300J: *C-130J Mods*	187.779	130.478	150.186	-	150.186	120.888	164.002	176.980	12.417	967.212	1,909.942
• APAF 05 Line Item C130J0: *C-130J*	10.727	-	-	-	-	-	-	-	-	0.000	10.727
• APAF 02 Line Item C130J0: *C-130J*	741.708	35.858	8.276	-	8.276	8.424	8.593	8.747	8.906	1,612.013	2,432.525

Remarks

E. Acquisition Strategy

The C-130J aircraft will be modified using a "block upgrade" strategy. The CNS/ATM, navigation safety requirement will initially, be met in three block upgrades. Block 6.0 development was funded from FY03-07. Block 7.0 started in FY07, and Block 8.1 began in FY12. Subsequently, C-130J modifications will be grouped into smaller updates known as Capability Management Updates (CMU). Other AMC initiatives are upgrades to hardware and software that have arisen after the formation of the block upgrades and CMUs.

In order to better manage the fleet and to avoid having to simultaneously support three separate aircraft configurations (Block 6, Block 7 and Block 8.1) the USAF has decided to combine the Block 7 and Block 8.1 mods. This will allow the aircraft and trainers to only have to be modified one time.

The proportion of CNS/ATM and navigation safety requirements allocated to Blocks 6.0 through 8.1 was determined via a design trade study conducted by Lockheed Martin (the C-130J prime contractor) and verified by the C-130J system program office and AMC. The development costs are being shared via a global Project Arrangement (PA) by the United States (USAF, USMC, USCG), the United Kingdom, Italy, Australia, Denmark, Canada, and Norway. An international program office (IPO), with USAF lead (Wright Patterson AFB, OH), manages the block upgrades development and CMU efforts. Retrofit of a Block on the aircraft is the responsibility of each nation.

In order to meet the Federal Aviation Administration 2020 mandate the USAF will install the Block 8.1 ADS-B Out/Mode V IFF solution on all C-130J variants not scheduled to receive Block 8.1 by January 2020. This is Mod #8649, ADS-B Out Acceleration. All C-130Js will still require Block 8.1.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401132F / *C-130J Program*	**Project (Number/Name)** 675061 / *C-130J*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
C-130J Block 8.1, Air Force Life Cycle Mgmt Ctr (AFMC), WPAFB, OH	SS/CPAF	Lockheed Martin Information Sytems : Marietta, GA	0.000	21.103	Apr 2018	11.070	Feb 2019	2.820		-		2.820	17.076	52.069	180.030
C-130J Capability Management Upgrades (CMU), Air Force Life Cycle Mgmt Ctr (AFMC), WPAFB, OH	SS/CPAF	Lockheed Martin Aero : Marietta, GA	0.000	0.385	May 2018	1.563	Jan 2019	3.120		-		3.120	10.706	15.774	6.480
C-130J AMC-Initiatives, Air Force Life Cycle Mgmt Ctr (AFMC), WPAFB, OH	SS/CPAF	Lockheed Martin Aero : Marietta, GA	0.000	0.910	Feb 2018	0.727	Feb 2019	0.450		-		0.450	4.629	6.716	14.730
C-130J Mobile User Objective System (MUOS), Air Force Life Cycle Mgmt Ctr (AFMC), WPAFB, OH	SS/CPAF	Lockheed Martin Aero : Marietta, GA	0.000	0.000		0.000		0.250		-		0.250	0.000	0.250	-
		Subtotal	0.000	22.398		13.360		6.640		-		6.640	32.411	74.809	N/A

Remarks

C-130J Block 8.1 Total Cost is below Target Value of Contract to account for the expected cost reduction initiatives on this Cost Plus Award Fee Contract.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
C-130J Block 8.1 DT and E	PO	EGLIN AFB : Eglin, FL	0.000	0.436	Jan 2018	-		-		-		-	0.000	0.436	7.490
		Subtotal	0.000	0.436		-		-		-		-	0.000	0.436	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
C-130J IPO Support	TBD	N/A : NV	0.000	1.874	Nov 2017	1.789	Oct 2018	1.900	Oct 2019	-		1.900	0.000	5.563	5.014

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0401132F / *C-130J Program*	Project (Number/Name) 675061 / *C-130J*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
C-130J COSSURM	TBD	RAF : NV	0.000	0.200	Jan 2018	0.260	Jan 2019	0.100		-		0.100	0.000	0.560	2.443
		Subtotal	0.000	2.074		2.049		2.000		-		2.000	0.000	6.123	N/A

Remarks

The COSSURM contract is managed by the United Kingdom Royal Air Force (RAF)

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	24.908		15.409		8.640		-		8.640	32.411	81.368	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401132F / *C-130J Program*	**Project (Number/Name)** 675061 / *C-130J*

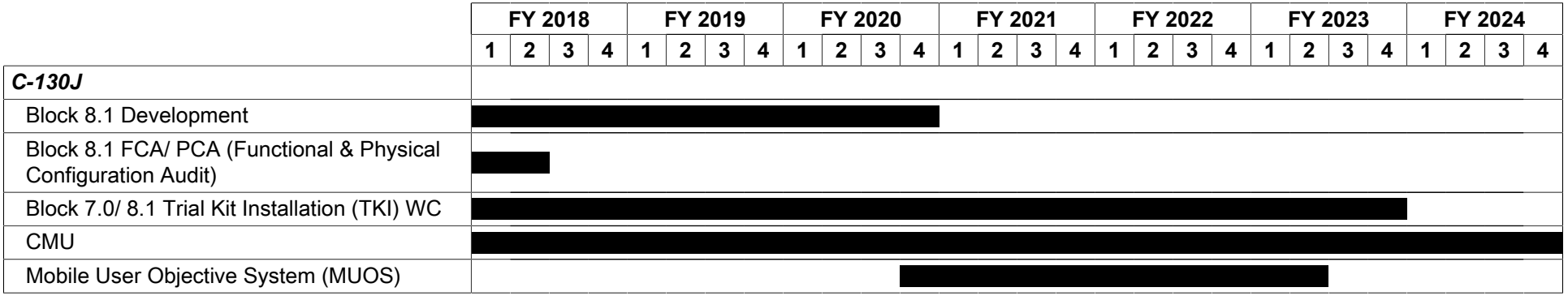

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401132F / *C-130J Program*	**Project (Number/Name)** 675061 / *C-130J*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
C-130J				
Block 8.1 Development	1	2018	4	2020
Block 8.1 FCA/ PCA (Functional & Physical Configuration Audit)	1	2018	2	2018
Block 7.0/ 8.1 Trial Kit Installation (TKI) WC	1	2018	4	2023
CMU	1	2018	4	2024
Mobile User Objective System (MUOS)	4	2020	2	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401134F / *Large Aircraft IR Countermeasures (LAIRCM)*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	5.095	4.334	5.424	0.000	5.424	5.518	5.633	0.000	0.000	Continuing	Continuing
674942: *Large Aircraft Infrared Counter Measures (LAIRCM)*	-	5.095	4.334	5.424	0.000	5.424	5.518	5.633	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Large Aircraft Infrared Countermeasures (LAIRCM) system is an evolutionary acquisition program that provides significantly improved defensive systems capability for DoD aircraft to counter the infrared (IR) man-portable air-defense systems (MANPADS) missile threat. The current LAIRCM system configuration [AN/AAQ-24V] consists of missile warning sensors (MWS), a laser transmitter assembly, control interface unit and processors to detect, track, jam and counter incoming IR missiles. The number of sensors and transmitter assemblies per aircraft is determined by the size and signature of the aircraft. The system is fully automatic following system power-up. LAIRCM requirements are documented in the multi-command Operational Requirements Document (ORD) LAIRCM ORD 314-92, validated on 03 Aug 98. The system is currently installed on 54+ aircraft types and over 1200 aircraft.

The baseline program development is complete. Follow-on efforts are addressing integration onto new aircraft types and existing LAIRCM platforms, design changes to address Reliability Maintainability & Availability and system improvements to counter new and emerging threats.

LAIRCM upgrades include, but are not limited to, hardware and software upgrades and testing of the LAIRCM system to maintain defensive capability against new and emerging threats.

Current and future efforts include Threat Analysis; Modeling, Simulation and Emulation Testing; Hardware, Software and Firmware Upgrades; Virtual System Integration Lab (SIL) Development; and Studies and Analysis.

Threat Analysis: Threat analysis encompasses the activities to support threat exploitation analysis of a variety of threats (both known and emerging) against the current LAIRCM jam code with the intent of determining if jam code updates are required. Typical threat analysis activities include: threat seeker characterization; model development for advanced threat IR seekers; development and testing of new infrared countermeasures concepts, techniques, and hardware; new technology assessment for potential incorporation into the LAIRCM system, and the evaluation/exploitation of new threats and threat characteristics relative to infrared countermeasures (IRCM).

Modeling, Simulation, and Emulation Testing: Modeling, Simulation, and Emulation activities verify and validate the information obtained from the threat analysis activities. These activities include: evaluation of (IRCM) techniques used in defeating real threat hardware; developing and evaluating jam code; validating and verifying integration of LAIRCM system components to newly developed jam codes, software or hardware; evaluating system effectiveness; performing platform integration support tests; and conducting predictive risk reduction tests prior to Live Missile Fire Test (LMFT) or on aircraft flight testing.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401134F / *Large Aircraft IR Countermeasures (LAIRCM)*

Hardware, Software, and Firmware Upgrades: Includes changes of any kind to any LAIRCM hardware components/support equipment with the purpose of adding capability, features, and enhancements which do not presently exist to ensure the LAIRCM system remains viable against current and emerging threats.
-----Hardware upgrade activities include engineering tasks required to design, develop, test and produce new capabilities, features, and enhancements, and changes of any kind to any portion of LAIRCM hardware with the purpose of adding capability, features and enhancements which do not presently exist.
-----Software upgrade activities include engineering tasks required to design, develop, and test the new or modified code that result in new capabilities, features, and enhancements and changes of any kind to any portion of LAIRCM software with the purpose of adding capability, features and enhancements which do not presently exist. Software upgrades can occur in any of the Line Replaceable Unit (LRU) Operation Flight Programs as well as any of the software residing in other LAIRCM associated components including those systems which support development and test or the LAIRCM support equipment.
-----Firmware upgrade activities include engineering tasks required to design, develop, and test the upgrades and those changes resulting from hardware and software updates/modifications as well as firmware upgrades which add new features.

Virtual SIL Development: Incrementally design, develop, integrate, and test software code and purchase associated infrastructure (i.e., computers, servers, commercial off-the-shelf (COTS) software, etc.) necessary to develop and implement a virtual SIL providing a critical capability for testing the LAIRCM system to ensure continued effectiveness against current and emerging threats.

Studies and Analysis: Includes logistics, programmatic, and engineering studies and analysis activities to ensure continued system viability and sustainability and compliance with acquisition directives. These activities may include the evaluation of low cost/high payback opportunities to reduce software development/ implementation cost, enhance production efficiency, and improve life cycle costs through increased reliability and reduced repair and return cost.

Program management and administration efforts consist of, but are not limited to, contract services and government costs. This program element may include necessary civilian pay expenses required to manage, execute, and deliver Aircraft Survivability weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, and 0605898F, and 0605833F.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401134F / *Large Aircraft IR Countermeasures (LAIRCM)*

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	5.283	4.334	5.424	0.000	5.424
Current President's Budget	5.095	4.334	5.424	0.000	5.424
Total Adjustments	-0.188	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	-0.188	0.000	0.000	0.000	0.000

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: LAIRCM Threat Analysis	2.210	3.048	2.589
Description: Encompasses the activities to support threat exploitation analysis of a variety of threats against the current LAIRCM jam code with the intent of determining if jam code updates are required. ***FY 2019 Plans:*** Continue to work on Threat analysis in the GWEF, to include purchase of assets, and DIME Lab. ***FY 2020 Plans:*** Continue to work on Threat analysis in the GWEF, to include purchase of assets, and DIME Lab. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decreased analysis planned for FY20 in order to fund software upgrade efforts.			
Title: LAIRCM Modeling, Simulation and Emulation Testing	0.567	0.560	0.787
Description: Activities that verify and validate the information obtained from threat analysis activities. ***FY 2019 Plans:*** Will continue to work in Modeling, Simulation and Emulation Tests. This is a continued effort from LAIRCM Development in previous years. ***FY 2020 Plans:***			

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401134F / *Large Aircraft IR Countermeasures (LAIRCM)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Will continue to work in Modeling, Simulation and Emulation Tests. This is a continued effort from LAIRCM Development in previous years. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Cost increase allows for inflationary adjustment of effort over FY18 effort.			
Title: LAIRCM Hardware/Software/Firmware Upgrades ***Description:*** Hardware/Software/Firmware Upgrades include changes of any kind to any LAIRCM hardware components/support equipment with the purpose of adding capability, features, and enhancements which do not presently exist to ensure the LAIRCM system remains viable against current and emerging threats. ***FY 2019 Plans:*** N/A ***FY 2020 Plans:*** LAIRCM will continue to make changes to LAIRCM hardware and software components/support equipment as necessary for the purpose of adding capability and feature enhancements which do not presently exist to ensure the LAIRCM system remains viable against current and emerging threats. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding increase to provide for software improvements.	0.000	0.000	0.850
Title: LAIRCM Virtual SIL Development ***Description:*** VSIL incrementally designs, develops, integrates, and tests software code and purchases associated infrastructure (i.e., computers, servers, COTS software, etc.) necessary to develop and implement a virtual SIL providing a critical capability for testing the LAIRCM system to ensure continued effectiveness against current and emerging threats. ***FY 2019 Plans:*** Will continue to design, develop, integrate, and test software code and purchase associated infrastructure (i.e., computers, servers, COTS software, etc.) necessary to develop and implement a virtual SIL providing a critical capability for testing the LAIRCM system to ensure continued effectiveness against current and emerging threats. ***FY 2020 Plans:***	1.774	0.330	0.348

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401134F / *Large Aircraft IR Countermeasures (LAIRCM)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Will continue to design, develop, integrate, and test software code and purchase associated infrastructure (i.e., computers, servers, COTS software, etc.) necessary to develop and implement a virtual SIL providing a critical capability for testing the LAIRCM system to ensure continued effectiveness against current and emerging threats. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding increase allows for minor inflationary adjustments to VSIL.			
Title: LAIRCM Studies and Analysis ***Description:*** Includes logistics, programmatic, and engineering studies and analysis activities to ensure continued system viability and sustainability and compliance with acquisition directives. These activities may include the evaluation of low cost/high payback opportunities to reduce software development/implementation cost, enhance production efficiency, and improve life cycle costs through increased reliability and reduced repair and return cost. ***FY 2019 Plans:*** Will initiate an engineering focused LAIRCM system Critical Program Information (CPI) Assessment and Review Study. ***FY 2020 Plans:*** Will initiate studies to address and/or assess various efforts and projects that enhance and/or update LAIRCM effectiveness. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase from FY19, restoring Studies and Analysis above FY18 levels.	0.544	0.396	0.850
Accomplishments/Planned Programs Subtotals	5.095	4.334	5.424

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APAF 05 Line Item LAIRCM: *Large Aircraft Infrared Countermeasures*	4.046	149.778	97.093	-	97.093	103.781	91.200	0.000	0.000	0.000	445.898

Remarks

E. Acquisition Strategy

Efforts awarded on an annual basis, exercising existing contract options, support threat analysis and system effectiveness. The LAIRCM program office partners with the Air Force Research Laboratory (AFRL), the 46th Test Squadron, and the Guided Weapon Evaluation Facility (GWEF) to conduct threat analysis research and Modeling, Simulation, and Emulation Testing. AFRL provides hardware-in-the-loop developmental test simulation capability on a level-of-effort (LOE) basis. AFRL's Dynamic Infrared Missile Evaluation (DIME) Laboratory performs threat analysis. The current LAIRCM contract may be used to award the various study efforts.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401134F / *Large Aircraft IR Countermeasures (LAIRCM)*

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401134F / *Large Aircraft IR Countermeasures (LAIRCM)*	**Project (Number/Name)** 674942 / *Large Aircraft Infrared Counter Measures (LAIRCM)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
LAIRCM ETA Hardware/ Software/Firmware Upgrades	SS/TBD	NGC : Rolling Meadows, IL	-	-		-		0.850	Mar 2020	-		0.850	Continuing	Continuing	-
LAIRCM ETA Virtual SIL Development	SS/TBD	NGC : Rolling Meadows, IL	-	1.774	Feb 2018	0.330	Apr 2019	0.348	Apr 2020	-		0.348	Continuing	Continuing	-
LAIRCM ETA Studies and Analysis	Various	Various : Various, NV	-	0.544	Mar 2018	0.396	Mar 2019	0.850	Mar 2020	-		0.850	Continuing	Continuing	-
		Subtotal	-	2.318		0.726		2.048		-		2.048	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
LAIRCM ETA Threat Analysis/Guided Weapon Evaluation Facility	PO	GWEF : Eglin AFB, FL	-	0.344	Jan 2019	0.343	Jan 2019	0.450	Apr 2020	-		0.450	Continuing	Continuing	-
LAIRCM ETA Modeling, Simulation and Emulation Test	MIPR	AFRL/RYF-Omni Sentinel : WPAFB, OH	-	0.403	Nov 2017	0.400	Apr 2019	0.627	Nov 2019	-		0.627	Continuing	Continuing	-
LAIRCM ETA Threat Analysis/Dynamic Infrared Missile Evaluation (DIME)	MIPR	AFRL/RYF-DIME : WPAFB, OH	-	1.600	Jan 2018	2.020	Jan 2019	1.839	Apr 2020	-		1.839	Continuing	Continuing	-
LAIRCM ETA Threat Analysis/ Asset Buys	MIPR	United States Army : Huntsville, AL	-	0.266	Jan 2018	0.685	Jan 2019	0.300	Jun 2020	-		0.300	Continuing	Continuing	-
		Subtotal	-	2.613		3.448		3.216		-		3.216	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401134F / *Large Aircraft IR Countermeasures (LAIRCM)*	**Project (Number/Name)** 674942 / *Large Aircraft Infrared Counter Measures (LAIRCM)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
LAIRCM ETA Government Travel	Various	Government Employees : WPAFB, OH	-	0.164		0.160		0.160		-		0.160	Continuing	Continuing	-
		Subtotal	-	0.164		0.160		0.160		-		0.160	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	5.095		4.334		5.424		-		5.424	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401134F / *Large Aircraft IR Countermeasures (LAIRCM)*	**Project (Number/Name)** 674942 / *Large Aircraft Infrared Counter Measures (LAIRCM)*

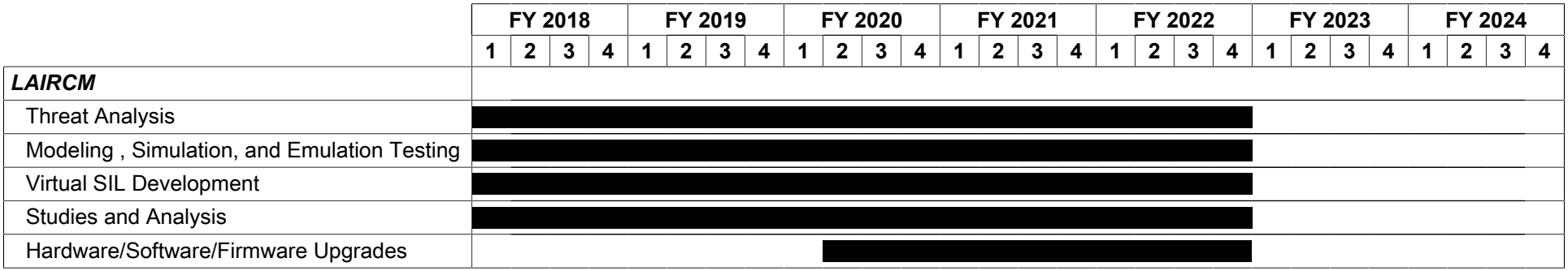

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401134F / *Large Aircraft IR Countermeasures (LAIRCM)*	**Project (Number/Name)** 674942 / *Large Aircraft Infrared Counter Measures (LAIRCM)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
LAIRCM				
Threat Analysis	1	2018	4	2022
Modeling , Simulation, and Emulation Testing	1	2018	4	2022
Virtual SIL Development	1	2018	4	2022
Studies and Analysis	1	2018	4	2022
Hardware/Software/Firmware Upgrades	2	2020	4	2022

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401218F / *KC-135s*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	8.645	3.493	0.000	0.000	0.000	4.600	0.249	0.249	0.000	Continuing	Continuing
675261: *KC-135 Upgrades*	-	8.645	3.493	0.000	0.000	0.000	4.600	0.249	0.249	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Aero-I SATCOM Replacement program will replace the obsolete Inmarsat Aero-I system with an Iridium system. Inmarsat's existing third generation satellites (I-3) which provide Aero-I services will no longer be functional after 31 Dec 22. Aero-I services are used to provide oceanic Controller/Pilot Data Link Communications (CPDLC) to Air Traffic Control and Aircraft Communications Addressing and Reporting System (ACARS) Beyond Line of Sight (BLOS) Command and Control (C2) messages to 618th Tactical Air Control Center (TACC) Global Decision Support System. The procurement effort modifies 359 C/KC-135s and 19 Simulators. Funding may be used to address DMS issues.

During acquisition strategy development, it was determined RDT&E funding (FY18 and FY19) is not required to field this capability.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	9.942	3.493	0.000	0.000	0.000
Current President's Budget	8.645	3.493	0.000	0.000	0.000
Total Adjustments	-1.297	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	-0.933	0.000			
• SBIR/STTR Transfer	-0.364	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401218F / *KC-135s*

Change Summary Explanation

-FY18: -$1.297M Reduction comprised of -.364 for SIBR and -.933 for reprograming actions

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: KC-135 Aero-I SATCOM	8.645	3.493	0.000
Description: Prototype integration and validation of Iridium Aero-I. Aero-I services are used to provide oceanic Controller/Pilot Data Link Communications (CPDLC) to Air Traffic Control and Aircraft Communications Addressing and Reporting System (ACARS) Beyond Line of Sight (BLOS) Command and Control (C2) messages to 618th Tactical Air Control Center (TACC) Global Decision Support System. ***FY 2019 Plans:*** Prototype Integration and validation of Iridium Aero-I SATCOM ***FY 2020 Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** During acquisition strategy development, it was determined RDT&E funding (FY18 and FY19) is not required to field this capability.			
Accomplishments/Planned Programs Subtotals	8.645	3.493	0.000

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APAF 05 Line Item C13500: *C-135*	69.428	113.076	124.491	-	124.491	104.383	108.192	110.159	-	Continuing	Continuing

Remarks

E. Acquisition Strategy

N/A

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0401218F / *KC-135s*	Project (Number/Name) 675261 / *KC-135 Upgrades*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Aero-I SATCOM replacement development	C/FFP	Not specified. : NV	-	8.145	Sep 2019	2.993	Mar 2019	-		-		-	Continuing	Continuing	-
		Subtotal	-	8.145		2.993		-		-		-	Continuing	Continuing	N/A

Remarks

This project will integrate an Iridium SATCOM solution for the KC-135.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AERO-I SATCOM Management Services	PO	Not specified. : NV	-	0.500	Jun 2018	0.500	Jun 2019	-		-		-	Continuing	Continuing	-
		Subtotal	-	0.500		0.500		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	8.645		3.493		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401218F / *KC-135s*	**Project (Number/Name)** 675261 / *KC-135 Upgrades*

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
KC-135 Aero-I SATCOM Replacement																												
Original strategy Contract Award, EMD, and Test																												

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401218F / *KC-135s*	**Project (Number/Name)** 675261 / *KC-135 Upgrades*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
KC-135 Aero-I SATCOM Replacement				
Original strategy Contract Award, EMD, and Test	4	2018	2	2019

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0401219F / *KC-10s*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	9.181	6.569	0.020	0.000	0.020	0.000	0.000	0.000	0.000	0.000	15.770
675195: *Aircraft Modernization Program (AMP)*	-	9.181	6.569	0.020	0.000	0.020	0.000	0.000	0.000	0.000	0.000	15.770
Quantity of RDT&E Articles	-	1	1	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The KC-10 is an aerial refueling asset built on the commercial DC-10 airframe. This aircraft creates an air bridge enabling rapid global mobility and global strike missions. There are 59 KC-10 aircraft in the USAF tanker fleet. KC-10 has a divestiture strategy that will follow Fiscal Year 2019 National Defense Authorization Act and Air Force requirements.

Mode 5 program is a Department of Defense mandated upgrade to the Identification Friend or Foe (IFF) system, the primary means of command and control aircraft identification. Mode 5 increases anti-spoofing capabilities and lowers the possibility of aircraft/aircrew loss due to misidentification of friendly aircraft. The KC-10 modification program includes a Mode 5 capable APX-119 transponder, a new KIV-77 crypto applique and integration/control through the CDU-7000F flight management computer.

A Federal Aviation Administration (FAA) mandated Automatic Dependent Surveillance-Broadcast (ADS-B) Out upgrade to the KC-10 is also included as part of Mode 5 to meet DO-260B requirements set by the FAA. Both IFF Mode 5 and ADS-B Out are mandated programs (Joint Requirements Oversight Council Memorandum 047-07 and FAA Advisory Circular 20-165B) that have a required incorporation no later than 1 January 2020 (ADS-B) and 1 July 2020 (Mode 5). Both modifications are accomplished by modification of the APX-119 Line Replaceable Unit (LRU) and can easily be accomplished at the same time and at a significant cost savings to the Air Force.

The program completes formal Engineering and Manufacturing Development (EMD) and will procure kits for installation on all KC-10 aircraft.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver KC-10 weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401219F / *KC-10s*

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	7.933	6.569	0.020	0.000	0.020
Current President's Budget	9.181	6.569	0.020	0.000	0.020
Total Adjustments	1.248	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	1.528	0.000			
• SBIR/STTR Transfer	-0.280	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: KC-10 Mode 5 IFF	9.181	6.569	0.020
Description: FAA mandated upgrade to the IFF system to increase anti-spoofing and exploitation capabilities and lower the possibility of aircraft/aircrew loss due to misidentfication of friendly aircraft. ***FY 2019 Plans:*** Continuation of engineering design and analysis effort (EMD). ***FY 2020 Plans:*** Continuation of engineering design and analysis effort (EMD). ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Transition from RDT&E Engineering and Manufacturing Development efforts to procurement and installation.			
Accomplishments/Planned Programs Subtotals	9.181	6.569	0.020

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APAF 05 Line Item C01000: *KC-10A (ATCA) - All Programs*	4.243	11.104	2.108	-	2.108	3.959	3.443	3.505	-	0.000	28.362

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401219F / *KC-10s*

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost

Remarks

E. Acquisition Strategy

The acquisition strategy will be a sole source RDT&E effort followed by procurement of kits and modification of KC-10 aircraft.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401219F / *KC-10s*	**Project (Number/Name)** 675195 / *Aircraft Modernization Program (AMP)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
KC-10 Mode 5: EMD	SS/CPFF	Rockwell Collins : Cedar Rapids, IA	-	8.359	Nov 2017	3.000	Oct 2018	-		-		-	0.000	11.359	-
		Subtotal	-	8.359		3.000		-		-		-	0.000	11.359	N/A

Remarks

11 Nov 17: EMD Contract awarded to Rockwell Collins Inc.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
KC-10 Mode 5: Test and Eval	SS/FPIF	Rockwell Collins : Cedar Rapids, IA	-	-		0.150	Oct 2018	-		-		-	0.000	0.150	0.740
KC-10 Mode 5: NAVAIR Range Support	MIPR	NAVAIR 5.1 : TBD	-	0.048	Sep 2018	-		-		-		-	0.000	0.048	-
KC-10 Mode 5: LCMP Document Support	MIPR	VC-25, GSA Contract - BAH : TBD	-	0.251	Jul 2018	2.669	Oct 2018	-		-		-	0.000	2.920	-
		Subtotal	-	0.299		2.819		-		-		-	0.000	3.118	N/A

Remarks

Funds ground, AIMS and flight testing, test range support, post test reports.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
KC-10 Mode 5: Mgmt Support	C/FFP	EPASS : Dayton, OH	-	0.408	Apr 2018	0.650	Apr 2019	-		-		-	0.000	1.058	0.630
KC-10 Mode 5: Govt Travel	Reqn	Not specified. : TBD	-	0.115	Oct 2017	0.100	Oct 2018	0.020	Oct 2019	-		0.020	0.000	0.235	-
		Subtotal	-	0.523		0.750		0.020		-		0.020	0.000	1.293	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401219F / *KC-10s*	**Project (Number/Name)** 675195 / *Aircraft Modernization Program (AMP)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks Funding for A&AS support contractors.															
		Project Cost Totals	-	9.181		6.569		0.020		-		0.020	0.000	15.770	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401219F / *KC-10s*	**Project (Number/Name)** 675195 / *Aircraft Modernization Program (AMP)*

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
KC-10 Mode 5																												
KC-10 Mode 5: EMD (contract awarded 16 Nov 17)	[redacted]																											

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401219F / *KC-10s*	**Project (Number/Name)** 675195 / *Aircraft Modernization Program (AMP)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
KC-10 Mode 5				
KC-10 Mode 5: EMD (contract awarded 16 Nov 17)	1	2018	1	2020

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0401314F / *Operational Support Airlift*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	5.196	3.172	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
676024: *VC-25 Avionics Modernization Program*	0.000	5.196	3.172	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

A. Mission Description and Budget Item Justification
October 2017, VC-25A Avionics Modernization Program (AMP) was de-scoped from upgrading the flight deck avionics to compliance with the mandates for civil Automatic Dependent Surveillance-Broadcast (ADS-B) Out and DoD Identification Friend or Foe (IFF) Mode 5 capability supporting the President of the United States as Head of State, Chief Executive, and Commander in Chief.

Installations are aligned with the aircraft heavy maintenance (HM) schedule. The de-scoped AMP requirements to ADS-B Out and IFF Mode 5 must integrate the 2020 mandate capability in HM18-8 and HM20-9 utilizing the remaining FY18 and FY19 funds for test, tech data integration, SIL, field team and other government costs. The National Security Waiver signed by Secretary of the Air Force 11 Dec 18 included the capability for ADS-B Out and IFF Mode 5 full FAA compliance 2025, which would utilize procurement funds but has not been funded.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401314F / *Operational Support Airlift*

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	6.681	3.172	0.000	0.000	0.000
Current President's Budget	5.196	3.172	0.000	0.000	0.000
Total Adjustments	-1.485	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	-1.299	0.000			
• SBIR/STTR Transfer	-0.186	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

Change Summary Explanation

FY18 Funding reduction from a -$1.299M reprogramming and -$0.186M SBIR transfer.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Design and Test	5.196	3.172	-
Description: Design and Test efforts included a Systems Integration Laboratory (SIL), material buys for the SIL, non-recurring engineering and test and evaluation. ***FY 2019 Plans:*** Funding to complete ADS-B Out and IFF Mode 5 2020 mandate includes correcting wiring diagrams in the WIRS system, finalizing tech data development, tech data integration into maintenance manuals, SE/PM and PMA. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding reduction BTR $1.299M and SBIR $0.186M to $5.196M in FY18 and $3.172M FY19 to complete 2020 FAA mandate.			
Accomplishments/Planned Programs Subtotals	5.196	3.172	-

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

The National Security Waiver signed by Secretary of the Air Force 11 Dec 18 included the capability for ADS-B Out/IFF Mode 5 full FAA compliance 2025, which will utilize procurement funds but has not been funded.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401314F / *Operational Support Airlift*

E. Acquisition Strategy

VC-25A AMP, ADS-B Out and IFF Mode 5 is being accomplished by developmental integration of commercial off-the-shelf systems, hardware procurement and installation aligns with HM depot schedules. A Cost Plus Incentive Fee (CPIF) contract was awarded Sep 17 to complete non-recurring engineering, kit, tech data and SIL development. The remaining RDT&E effort includes the second kit, install, correcting wiring diagrams in the WIRS system, finalizing tech data development, tech data integration into maintenance manuals, SE/PM, Other Government Cost (OGC) and PMA. Delivery of the first aircraft is scheduled in FY19 and second kit configuration in FY20.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401314F / *Operational Support Airlift*	**Project (Number/Name)** 676024 / *VC-25 Avionics Modernization Program*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
VC-25 AMP Engineering	SS/CPIF	Oklahoma City : Tinker, AFB, OK	0.000	4.142	Jan 2018	1.800	Mar 2018	-		-		-	0.000	5.942	-
		Subtotal	0.000	4.142		1.800		-		-		-	0.000	5.942	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
OGC/PMA	MIPR	Not specified. : TBD	0.000	1.054	Jul 2018	1.372	Jul 2019	-		-		-	0.000	2.426	-
		Subtotal	0.000	1.054		1.372		-		-		-	0.000	2.426	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	5.196		3.172		-		-		-	0.000	8.368	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401314F / *Operational Support Airlift*	**Project (Number/Name)** 676024 / *VC-25 Avionics Modernization Program*

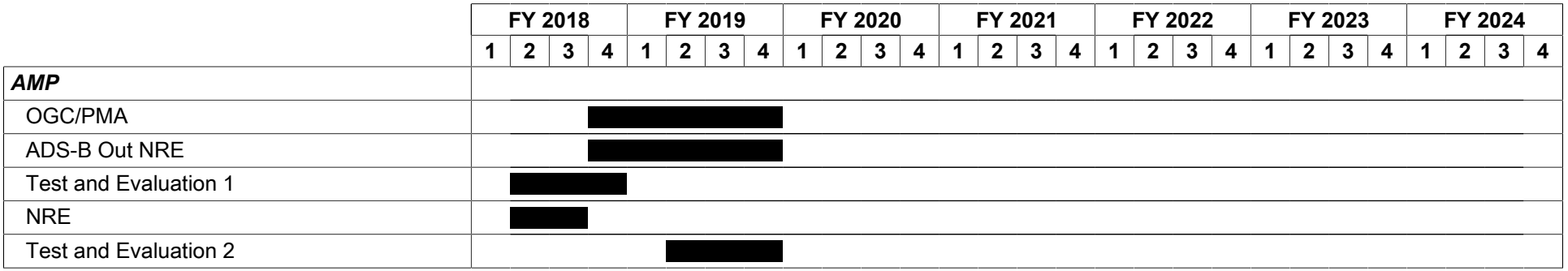

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401314F / *Operational Support Airlift*	**Project (Number/Name)** 676024 / *VC-25 Avionics Modernization Program*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
AMP				
OGC/PMA	4	2018	4	2019
ADS-B Out NRE	4	2018	4	2019
Test and Evaluation 1	2	2018	4	2018
NRE	2	2018	3	2018
Test and Evaluation 2	2	2019	4	2019

Note

Funding request submitted in FY21 POM.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0401318F / *CV-22*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	92.223	17.744	16.502	17.906	0.000	17.906	18.453	17.473	17.459	17.737	41.970	257.467
676033: *CV-22 RDT&E POST PRODUCTION*	92.223	17.744	16.502	17.906	0.000	17.906	18.453	17.473	17.459	17.737	41.970	257.467
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Program MDAP/MAIS Code: 212
Project MDAP/MAIS Code(s): N42

A. Mission Description and Budget Item Justification

The CV-22 is the Air Force Special Operations Forces (SOF) variant of the joint multi-mission V-22 tilt rotor aircraft. The CV-22 provides long-range, high-speed infiltration, exfiltration, and resupply to Special Forces teams in hostile, denied, and politically sensitive areas. The Navy is the lead service for the Joint V-22 program. The Joint Program Manager is responsible for managing all variants of the V-22. Department of the Navy (DoN) funds the development of the MV-22 and CMV-22. The Air Force funds the service common portion of the CV-22 while United States Special Operations Command (USSOCOM) funds the development and procurement of SOF peculiar systems. CV-22 RDT&E funding provides for the development, integration, and testing of service-common, mission critical aircraft modifications to improve operational effectiveness, platform survivability, and aircraft availability.

Nacelle Improvements: Funds the design and development of the CV-22 nacelle to increase engine time on wing by reducing ingestion of sand/dust and other particulate matter into the engine, improving reliability and maintainability and reducing operations and support costs. This is Air Force Special Operations Command's #1 priority for the CV-22 weapon system.

Enhanced Self-Deployment: RDT&E funding provides for the design, development, and testing of aircraft modifications to improve aircraft self-deployment capabilities (e.g., operating range, global response time) to mitigate emerging threats to the aircraft and mission accomplishment, and to identify and assess emerging air vehicle, propulsion system, avionics architecture, electronic warfare, situational awareness, and other weapon system solutions in meeting CV-22 Block C/20 capability requirements.

Future Capabilities/Affordable Sustainability: Funding provides for future modification planning, and for aircraft engineering changes/upgrades to address diminishing manufacturing source (DMS) and component obsolescence issues adversely affecting aircraft readiness and operational availability rates, as well as improved operational safety, suitability, cyber security, and mission effectiveness.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver CV-22 weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, and 0605898F.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401318F / *CV-22*

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	22.519	18.502	16.606	0.000	16.606
Current President's Budget	17.744	16.502	17.906	0.000	17.906
Total Adjustments	-4.775	-2.000	1.300	0.000	1.300
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-4.000	-2.000			
• SBIR/STTR Transfer	-0.775	0.000			
• Other Adjustments	0.000	0.000	1.300	0.000	1.300

Change Summary Explanation

FY18: -$4M decrease for Omnibus reprogramming. -$.775M decrease for SBIR reduction.

FY19: -$2M decrease for Congressional mark for "Improved Inlet Solution (IIS) delays".

FY20: +$1.3M increase to fully fund the IIS program.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Nacelle Improvements	12.196	8.141	10.303
Description: Funds design, development, and testing of V-22 Nacelle Improvements- Infrared Suppressor (IRS), Electric Power System Upgrade, Generator Control Unit (GCU) upgrade and relocation; nacelle wiring, heat exchanger improvements, engine health monitoring, nacelle structure, performance buyback, and upgrades other nacelle systems and components. Common nacelle improvements for both the CV-22 and MV-22 fleets will increase overall aircraft readiness/availability, reduce platform operating life cycle costs, and mitigate impacts to aircraft performance and survivability. These improvements will be integrated, tested, and fielded as block modifications to minimize cost and impact on fleet operations and readiness.			

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401318F / *CV-22*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY 2019 Plans: Continue test, design, and development of Nacelle Improvements, Electrical Power System upgrade, and IRS redesign. Begin studies for the future performance buyback of aircraft. IIS: Continue updated solution to the engine air particle separation efficiency DT&E effort. GCU: Continue DT&E efforts to improve reliability, reparability, and maintainability. IRS: Finalize DT&E of alternatives. Performance Buyback: Begin studies to improve future performance of aircraft. ***FY 2020 Plans:*** Continue test, design, and development of Nacelle Improvements; Electrical Power System upgrade, IRS redesign, and Performance Buyback. IIS: Continue updated solution to the engine air particle separation efficiency DT&E effort. GCU: Continue efforts to improve reliability, reparability, and maintainability IRS: Continue analyzing data and developing selected alternative to improve reliability. Performance Buyback: Continue studies to improve future performance of aircraft. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase to support the requirement for Performance Buyback studies.			
Title: Enhanced Self-Deployment Capabilities	5.548	8.361	7.603
Description: Develops capabilities to enhance self-deployment, such as improved ice protection, engine performance, navigation, communications, and battle space awareness/networking capabilities; situational awareness; electronic warfare; weapons systems; defensive avionics systems and architecture; weight reduction initiatives; modular avionics/cyber security implementation; airborne networking, and other changes to the underlying aircraft systems necessary to enable these capabilities. ***FY 2019 Plans:*** Continue design and development activities to enhance situational awareness, modular avionics/cyber security implementation, and development of electronic warfare capabilities. ***FY 2020 Plans:*** Continue design and development activities to enhance situational awareness, modular avionics/cyber security implementation, and begin integration and testing of developed electronic warfare capability. ***FY 2019 to FY 2020 Increase/Decrease Statement:***			

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401318F / *CV-22*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Decrease due to reprioritizing resources.			
Accomplishments/Planned Programs Subtotals	17.744	16.502	17.906

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• RDTE 07 PE 1160403BB: *Special Operations, Aviation Systems*	12.292	22.344	28.081	-	28.081	10.093	9.634	17.942	18.360	0.000	118.746
• APAF 02 Line Item Special Operation: *CV-22 Modification*	42.178	32.529	17.256	-	17.256	21.509	38.770	45.569	70.188	314.225	582.224
• APAF 05 Line Item V02200: *CV-22 Mods*	60.990	60.416	65.348	-	65.348	122.473	164.227	151.551	146.864	518.104	1,289.973
• APAF 06 Line Item 000999: *CV-22 Initial Spares/Repair Parts*	0.241	0.000	0.000	-	0.000	6.583	10.946	3.500	0.000	0.000	21.270
• APAF 07 Line Item C0V220: *CV-22 Post-Production Support*	4.500	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.500
• RDTE 05 PE 0604262N: *V-22A Navy*	176.804	135.504	185.105	-	185.105	133.059	110.392	125.330	110.769	184.398	1,161.361

Remarks

In addition to the funding identified in the table above, prior year funding includes $520.411 in RDT&E, DW, BA07, PE 1160421BB: Special Operations, CV-22 Development, and $413.235M in RDT&E, AF, BA05, PE 0401318F: CV-22

E. Acquisition Strategy

The V-22 Joint Program Office (Naval Air Systems Command (NAVAIRSYSCOM), PMA-275) is developing new capabilities for the V-22 in block increments.

--Nacelle Improvements: IIS, IRS and GCU will utilize some combination of sole source and competitive contracts.

--Enhanced Self-Deployment Capabilities: The Army Technology Applications Program Office at Ft Eustis awarded a FFP contract in June 2016 for LRU-1 Ethernet design (IBR) with additional RAA funds added in September 2017. The FY2019 plan is to add incremental funding for LRU-1 Ethernet Design Phase 2 and Phase 3. FY2020 will begin the integration and testing phase.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401318F / *CV-22*

Development activities for the V-22 program to date have been primarily performed by the prime contractor, Bell-Boeing, on a sole-source basis. Bell-Boeing is a strategic partnership between Bell Helicopter and Boeing Integrated Defense Systems. Efforts are underway to continue increasing competition where feasible, depending primarily on the level of platform integration required and Government rights to needed technical data.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401318F / *CV-22*	**Project (Number/Name)** 676033 / *CV-22 RDT&E POST PRODUCTION*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CV-22 Osprey Block 20 Development	SS/CPFF	Bell Boeing : Amarillo, TX	8.047	-		-		-		-		-	0.000	8.047	163.825
V-22 Nacelle Improvements	Various	Various : Various	41.702	12.196	Dec 2017	6.945	Feb 2019	8.703	Mar 2020	-		8.703	0.000	69.546	-
CV-22 Osprey Enhanced Self-deployment Capability	Various	Various : Various	29.417	3.460	Mar 2018	7.361	Mar 2019	6.133	Jun 2020	-		6.133	60.160	106.531	0.000
		Subtotal	79.166	15.656		14.306		14.836		-		14.836	60.160	184.124	N/A

Remarks

Block 20 Development Target Value of Contract differs from total cost because most of the Block 20 development cost was funded in PE 0401318F, BA05. In addition, the SOF peculiar development efforts were funded by USSOCOM MFP-11 funding.

Nacelle Improvements Development Target Value of Contract differs from total cost because this is a joint development funded by Navy and Air Force.

Prior Years funding ($322.656M) was executed in PE 0401318F, BA05.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CV-22 Osprey Engineering Technical Support and Studies	Various	Various : Various	4.599	1.000	Mar 2018	1.000	Mar 2019	1.370	Mar 2019	-		1.370	9.721	17.690	0.000
		Subtotal	4.599	1.000		1.000		1.370		-		1.370	9.721	17.690	N/A

Remarks

Prior Years Funding $40.454M was executed in PE 0401318F (BA05).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401318F / *CV-22*	**Project (Number/Name)** 676033 / *CV-22 RDT&E POST PRODUCTION*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CV-22 Osprey Test & Evaluation Technical Support	Various	Various : Various	7.809	0.900	Dec 2016	1.000	Dec 2018	1.500	Dec 2019	-		1.500	7.323	18.532	0.000
		Subtotal	7.809	0.900		1.000		1.500		-		1.500	7.323	18.532	N/A

Remarks

Prior Years Funding $46.764M was executed in PE 0401318F (BA05).

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CV-22 Osprey Mission Support	Allot	AFLCMC/WIV : Patuxent River, MD	0.649	0.188	Nov 2017	0.196	Nov 2018	0.200	Nov 2019	-		0.200	1.896	3.129	-
		Subtotal	0.649	0.188		0.196		0.200		-		0.200	1.896	3.129	N/A

Remarks

Prior Years Funding $3.361M was executed in PE 0401318F (BA05).

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	92.223	17.744		16.502		17.906		-		17.906	79.100	223.475	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401318F / *CV-22*	**Project (Number/Name)** 676033 / *CV-22 RDT&E POST PRODUCTION*

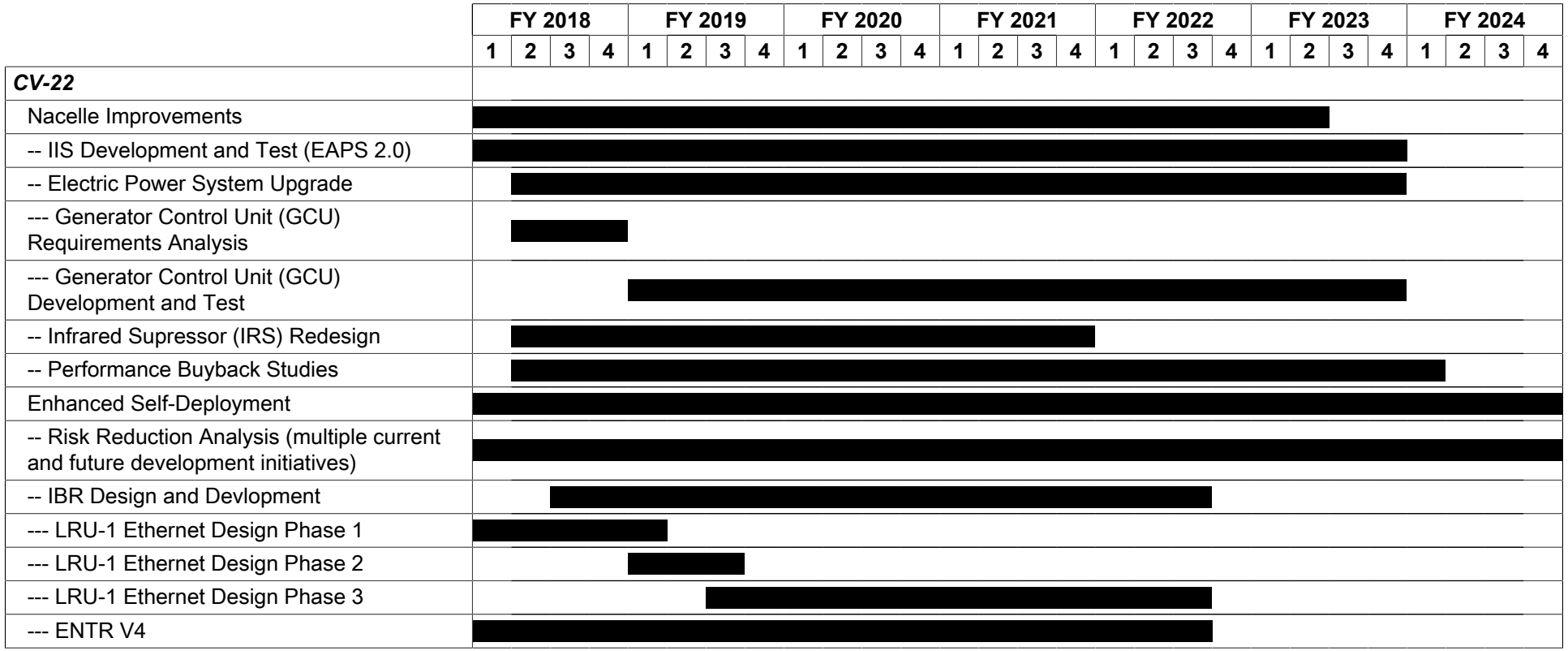

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401318F / *CV-22*	**Project (Number/Name)** 676033 / *CV-22 RDT&E POST PRODUCTION*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
CV-22				
Nacelle Improvements	1	2018	2	2023
-- IIS Development and Test (EAPS 2.0)	1	2018	4	2023
-- Electric Power System Upgrade	2	2018	4	2023
--- Generator Control Unit (GCU) Requirements Analysis	2	2018	4	2018
--- Generator Control Unit (GCU) Development and Test	1	2019	4	2023
-- Infrared Supressor (IRS) Redesign	2	2018	4	2021
-- Performance Buyback Studies	2	2018	1	2024
Enhanced Self-Deployment	1	2018	4	2024
-- Risk Reduction Analysis (multiple current and future development initiatives)	1	2018	4	2024
-- IBR Design and Devlopment	3	2018	3	2022
--- LRU-1 Ethernet Design Phase 1	1	2018	1	2019
--- LRU-1 Ethernet Design Phase 2	1	2019	3	2019
--- LRU-1 Ethernet Design Phase 3	3	2019	3	2022
--- ENTR V4	1	2018	3	2022

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0401840F / *AMC Command and Control System*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	3.394	1.688	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
674879: *Camps*	-	3.394	1.688	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In CY 18 Consolidated Air Mobility Planning System (CAMPS) Increment 1 was a new start. SPARTA prototype has been delivered and will be transitioned into CAMPS. No RDT&E funds will be required past FY19.

A. Mission Description and Budget Item Justification

A. Mission Description and Budget Item Justification

Consolidated Air Mobility Planning System (CAMPS) Increment 1.
The CAMPS Increment I program is the primary critical joint requirements management system for Special Assignment Air Mission (SAAM), Air Refueling (AR) scheduling, and Intra-theater air movement requests. It is also the primary USTRANSCOM and Air Mobility Command Command and Control (AMC C2) planning and scheduling tool enabling Mobility Air Force (MAF) resources to support peacetime, contingency, humanitarian, and wartime operations. In the Air Refueling Management System (ARMS), CAMPS provides the ability to request, manage and validate requests for air refueling. Force-level CAMPS users include the USTRANSCOM Fusion Center, 618th Air Operations Center (AOC) Tanker Airlift Control Center (TACC), and other AOC Air Mobility Divisions (AMDs). Several web-based applications also support movement and air refueling requests for globally distributed Joint, Service, and Wing/Unit level users.

The 618 AOC (TACC) is a global air operations center responsible for planning and executing airlift and air refueling missions in support of the Joint Deployment and Distribution Enterprise (JDDE). Although primarily used by the 618 AOC (TACC), CAMPS also supports validation, planning, and scheduling activities found at AMD and USTRANSCOM. CAMPS airlift and air refueling requirement management applications are available for all globally distributed Joint, Service, and Wing/Unit level users that need to request airlift or air refueling.

The current CAMPS AR scheduling capability does not have access to all data sources necessary to maintain visibility of and support for all potential re-planning requirements and therefore can have ‘blind spots' which hinder its ability to provide robust support for planning and re-planning across the entire "initial through final” planning phase. This CAMPS Increment I (modernization) effort will build on the existing technology transitioned from RDT&E initiatives.

FY19 continued funding for Air Refueling scheduling capability development and testing to provide planners an integrated human-in-the-loop and machine-based cooperative system which provides the ability to rapidly generate and evaluate multiple potential solution candidates to satisfy requirements. This increases the effectiveness and efficiency with which Air Refueling assets are employed and support increased operational agility through rapid, effective and efficient re-planning while minimizing the impact on currently planned mission sets. The AR scheduling metrics component enables on-going improvement of the AR scheduling system and can be developed after extensive analysis and iterations with the constituent user sets and command authorities. Funding for this exhibit contained in PE 0401840F.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401840F / *AMC Command and Control System*

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	3.510	1.688	0.000	0.000	0.000
Current President's Budget	3.394	1.688	0.000	0.000	0.000
Total Adjustments	-0.116	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	-0.116	0.000	0.000	0.000	0.000

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: CAMPS Increment 1 Dvelopment	3.394	1.688	0.000	0.000	0.000
Description: Continued development of Consolidated Air Mobility Planning System (CAMPS) Increment one, Air Refueling scheduling planning capability					
FY 2019 Plans: Continued development of Consolidated Air Mobility Planning System (CAMPS) Increment one, Air Refueling scheduling planning capability.					
FY 2020 Base Plans: No funding required in FY20					
FY 2020 OCO Plans:					

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401840F / *AMC Command and Control System*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** No funding required in FY20.					
Accomplishments/Planned Programs Subtotals	3.394	1.688	0.000	0.000	0.000

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPAF 03 Line Item 834070: *AMC Command and Control System*	10.083	10.192	10.369	-	10.369	10.557	10.745	10.937	11.133	Continuing	Continuing

Remarks

E. Acquisition Strategy

This effort is being developed, demonstrated, and documented in a way that supports rapid and low cost acquisition and sustainment.

CAMPS Increment 1 is being executed under USTRANSCOM Acquisition Authority and shall be acquired using the DODI 5000.02 Model 3 approach for Incrementally Deployed Software Intensive Program.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401840F / *AMC Command and Control System*	**Project (Number/Name)** 674879 / *Camps*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Tanker Capability	C/FFP	Superlative Technology : O'Fallon, IL	-	3.394	Mar 2018	1.688		-		-		-	Continuing	Continuing	-
		Subtotal	-	3.394		1.688		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	3.394		1.688		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401840F / *AMC Command and Control System*	**Project (Number/Name)** 674879 / *Camps*

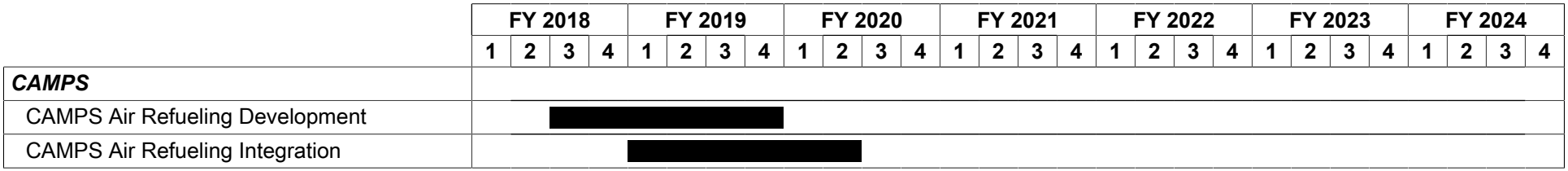

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401840F / *AMC Command and Control System*	**Project (Number/Name)** 674879 / *Camps*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
CAMPS				
CAMPS Air Refueling Development	3	2018	4	2019
CAMPS Air Refueling Integration	1	2019	2	2020

Note

3Q/FY18 Begin CAMPS Air Refueling Development
1Q/FY19 Begin CAMPS Air Refueling Integration
4Q/FY19 Complete CAMPS Air Refueling Development
2Q/FY20 Complete CAMPS Air Refueling Integration

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0408011F / *Special Tactics / Combat Control*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	7.726	2.433	3.629	0.000	3.629	7.687	6.750	6.191	9.000	Continuing	Continuing
675138: *ST System Development*	-	7.726	2.433	3.629	0.000	3.629	7.687	6.750	6.191	9.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Special Tactics (ST) System Development project focuses on modernization development for the Battlefield Air Operations (BAO) Kit. This program is part of the overarching Battlefield Airmen Modernization (BA-Mod) Program. BAO Kit will develop, test, train, and modernize the existing and future Family of Systems (FoS) that provide a state-of-the-art Command, Control, Communications, Computer, Intelligence, Surveillance, and Reconnaissance (C4ISR) capability. It also provides a suite of systems for all Air Force Specialty Codes supporting the ST community within the Air Force Special Operations Command's (AFSOC's) Battlefield Airmen. Efforts in ST System Development focus on reducing the risk of fratricide and substantially reducing size and weight of the equipment carried through three core capabilities, which are not limited to: Human Machine Interface (HMI), Line of Sight (LOS) targeting, medical monitoring, and Machine-to-Machine (M2M) C4ISR System and all other ST capability needs.

This program will develop and enhance technologies for Battlefield Airmen ST operators to recognize, identify, range, nominate, and designate targets during both day and night operations. BAO Kit will also significantly reduce the time required to find, track, fix targets, and engage the enemy by providing highly accurate target grid coordinates in three dimensions, generating target imagery both pre- and post-strike, and transmitting target data to Command and Control centers. BAO Kit systems are light, compact, and portable for use by dismounted Battlefield Airmen. FY20 BAO Kit funding will provide significant improvements in operational capability, situational awareness, and precision lethality in the battle space while continuing to build and enhance the BAO Kit family of systems. This may be conducted through industry technology demonstrations, prototypes, and associated engineering support to posture the BAO Kit for technology insertion. These efforts will deliver enhanced capability for the dismounted soldier in terms of dramatic weight reduction and increase mission effectiveness across the conflict spectrum. BAO also supports AFSOC Tactical Command and Control (TAC C2) programs to develop and enhance communications systems and equipment essential for ST combat controllers, pararescue, combat weather operators, and tactical air controller parties within AFSOC to perform their mission. The ST operators use this equipment to gather and transmit assault zone suitability and weather data and to perform tactical airfield/assault landing/drop zone operations. Due to the rapidly changing threat environment, the acquisition program manager has the authority to redirect funding as necessary to meet current slated and emerging requirements. The above efforts may change based on the need to support current Air Force mission requirements.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver special tactic capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0408011F / *Special Tactics / Combat Control*

The Special Tactics (ST) System Development activities also include studies, analysis, and risk-reduction activities to support both current and future program planning and execution.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	8.090	2.541	6.203	0.000	6.203
Current President's Budget	7.726	2.433	3.629	0.000	3.629
Total Adjustments	-0.364	-0.108	-2.574	0.000	-2.574
• 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	-0.364	-0.108			
• Other Adjustments	0.000	0.000	-2.574	0.000	-2.574

Change Summary Explanation

Funding decreased due to higher DoD priorities in FY19. Required funding profile in FY20 has also now been rephased due to higher DoD priorities. FY21 funding profile covers known requirements.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Human Machine Interface (HMI)	1.891	0.340	0.830
Description: HMI is a system of systems that provides integrated operator interface between all the machine components by using unified visual and auditory displays and controls, such as head-mounted displays, tactical earplug connectivity with man pack or handheld communications, integrated tactical computing solution, and power generation and management systems.			
FY 2019 Plans:			

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0408011F / *Special Tactics / Combat Control*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Capability supports digitally aided combat close air support operations. Plan to develop and operate tests or full spectrum certification (Joint Interoperable Test Command (JITC), Air Force System Interoperability Test (AFSIT), and Authority to Operate (ATO)). - Continue to explore and define requirements for implementation of the Iridium waveform granting DoD dedicated airtime. - Continue communications development: Upgrade HMI efforts which reduced the Size, Weight, and Power (SWAP) required to be carried by the Special Tactics Community. Specifically includes wireless technology. - Requires maturation of available technology for future dismounted communication contract in order to meet the requirements of the user. - Due to the rapidly changing threat environment, the acquisition program manager has the authority to redirect funding as necessary to meet current slated and emerging requirements. The above efforts may change based on the need to support current Air Force mission requirements. ***FY 2020 Plans:*** - Capability will support digitally aided combat close air support operations. Plan to develop and operate tests or full spectrum certification (Joint Interoperable Test Command (JITC), Air Force System Interoperability Test (AFSIT), and Authority to Operate (ATO)). - Will continue to explore and define requirements for implementation of the Iridium waveform granting DoD dedicated airtime. - Will continue communications development: will upgrade HMI efforts which reduced the Size, Weight, and Power (SWAP) required to be carried by the Special Tactics Community. Specifically includes wireless technology. - Will require maturation of available technology for future dismounted communication contract in order to meet the requirements of the user. - Due to the rapidly changing threat environment, the acquisition program manager has the authority to redirect funding as necessary to meet current slated and emerging requirements. The above efforts may change based on the need to support current Air Force mission requirements. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding decreased due to higher DoD priorities in FY19. Required funding profile resumes in FY20			
Title: Line of Sight	0.273	0.001	0.002
Description: Line of Sight (LOS) targeting enables the ST Battlefield Airmen to find, fix, track, target and, engage the enemy at close range during day or night operations by providing highly accurate target coordinates in three dimensions. LOS generates vital imagery both pre and post-strike at a fraction of the weight and is more efficient than legacy equipment carried by the operator. Non Line of sight (XLOS) targeting device exploration and development will help capture future capabilities to the Special Tactics community. XLOS devices allow for a remote expendable reporting environmental sensor that enhances			

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0408011F / *Special Tactics / Combat Control*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
AFSOC Special Operation Weather Team's (SOWT) ability to provide timely, accurate, and critical deep battle space weather reconnaissance and intelligence. ***FY 2019 Plans:*** - Continue to explore and develop future Non Line of sight (XLOS) targeting device capabilities for Special Tactics community. - Due to the rapidly changing threat environment, the acquisition program manager has the authority to redirect funding as necessary to meet current slated and emerging requirements. The above efforts may change based on the need to support current Air Force mission requirements. ***FY 2020 Plans:*** - Will continue to explore and develop future Non Line of sight (XLOS) targeting device capabilities for Special Tactics community. - Due to the rapidly changing threat environment, the acquisition program manager has the authority to redirect funding as necessary to meet current slated and emerging requirements. The above efforts may change based on the need to support current Air Force mission requirements. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding decreased due to higher DoD priorities in FY19. Required funding profile resumes in FY20			
Title: Machine-to-Machine (M2M) Software Development ***Description:*** A suite of map-centric software applications that enables M2M transfer of precision targeting, information management, C4ISR (Command, Control Communications, Computers, Intelligence, Surveillance, and Reconnaissance), and Situational Awareness (SA) information. Provides the ST Battlefield Airmen the ability to find, fix, track, target, and engage the enemy which greatly reduces the kill chain and drastically decreases the possibility of fratricide by enhancing the operator's SA on the battlefield. ***FY 2019 Plans:*** - Explore requirements to include future FoS capability gap. - Continue research and developmental efforts to support requirements in BAO FoS CDD, which includes but is not limited to Assault Zones, Fires, Weather, Personnel Recovery, and Enabling Capabilities. - Due to the rapidly changing threat environment, the acquisition program manager has the authority to redirect funding as necessary to meet current slated and emerging requirements. The above efforts may change based on the need to support current Air Force mission requirements. ***FY 2020 Plans:*** - Will continue to explore requirements to address future FoS capability gaps.	5.562	2.092	2.797

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0408011F / *Special Tactics / Combat Control*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Will continue research and developmental efforts to support requirements in BAO FoS CDD, which includes but is not limited to Assault Zones, Fires, Weather, Personnel Recovery, and Enabling Capabilities. - Due to the rapidly changing threat environment, the acquisition program manager has the authority to redirect funding as necessary to meet current slated and emerging requirements. The above efforts may change based on the need to support current Air Force mission requirements. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding decreased due to higher DoD priorities in FY19. Required funding profile resumes in FY20			
Accomplishments/Planned Programs Subtotals	7.726	2.433	3.629

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPAF 03 Line Item 837100: *Tactical C-E Equipment*	16.644	61.389	52.094	-	52.094	44.269	66.330	19.315	25.664	Continuing	Continuing
• OPAF 04 Line Item 842990: *Personal Safety and Rescue Equipment*	9.630	10.118	6.299	-	6.299	2.506	2.330	2.371	2.414	Continuing	Continuing

Remarks

E. Acquisition Strategy

BAO Kit awarded a contract in FY16 to complete M2M software development. This effort will include system engineering, design, integration, and fielding support for M2M software. Due to the rapidly changing threat environment, the acquisition program manager has the authority to redirect funding as necessary to meet current slated and emerging requirements. The above efforts may change based on the need to support current Air Force mission requirements. Wright Patterson AFB, OH manages the contract effort.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0408011F / *Special Tactics / Combat Control*	Project (Number/Name) 675138 / *ST System Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Human Machine Interface (HMI)	C/Various	Various : Various	-	1.891	Oct 2017	0.303	Oct 2018	0.823	Oct 2019	-		0.823	Continuing	Continuing	-
Line of Sight	SS/ Various	Phsyical Optics Corporation : Torrance, CA	-	0.273	Nov 2017	0.001	Nov 2018	0.001	Nov 2019	-		0.001	Continuing	Continuing	-
Machine-To-Machine (M2M) Software Development	C/CPFF	Systems Research & Applications Corp : Dayton, OH	-	4.913	Mar 2018	1.723	Feb 2019	2.147	Feb 2020	-		2.147	Continuing	Continuing	-
		Subtotal	-	7.077		2.027		2.971		-		2.971	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Agency Support	Various	46 TS : Eglin AFB, FL	-	0.266	Oct 2017	0.205	Oct 2018	0.275		-		0.275	Continuing	Continuing	-
		Subtotal	-	0.266		0.205		0.275		-		0.275	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Administration	Various	Various : Various, NV	-	0.383	Oct 2017	0.201	Oct 2018	0.383		-		0.383	Continuing	Continuing	-
		Subtotal	-	0.383		0.201		0.383		-		0.383	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	7.726		2.433		3.629		-		3.629	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0408011F / *Special Tactics / Combat Control*	**Project (Number/Name)** 675138 / *ST System Development*

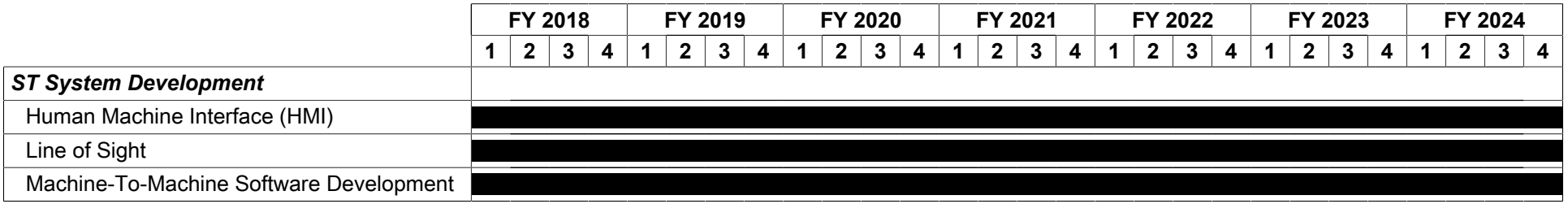

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0408011F / *Special Tactics / Combat Control*	**Project (Number/Name)** 675138 / *ST System Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ST System Development				
Human Machine Interface (HMI)	1	2018	4	2024
Line of Sight	1	2018	4	2024
Machine-To-Machine Software Development	1	2018	4	2024

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0702207F / *Depot Maintenance (Non-IF)*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	1.517	1.897	1.890	0.000	1.890	1.974	2.017	2.087	2.125	Continuing	Continuing
673326: *Precision Measurement & Calibration*	-	1.517	1.897	1.890	0.000	1.890	1.974	2.017	2.087	2.125	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program develops, tests, and evaluates national and Air Force measurement standards (hardware) and calibration equipment in support of all Air Force programs and activities, including Precision Measurement Equipment Laboratories (PMELs) worldwide. Metrology research and development provides technology to support systems in all phases of development and acquisition, as well as Air Force R&D laboratories, test ranges, ground test facilities, and operational weapons systems support. Rapidly changing technology requires continuing research and development of measurement standards and calibration equipment to ensure modern weapon systems meet Air Force readiness objectives. This program addresses all metrology disciplines and includes the technology areas of laser, infrared, microwave, millimeter wave, optical, physical, mechanical, electrical, electronic, and ionizing radiation measurements. Metrology is a technical discipline devoted to the science of measurements and to the study and improvement of measurement technology. Measurements are the foundation of military system development, quality assurance, hardware conformance testing and system readiness tests. The integrity of these tests is assured through calibration and traceability assurance schemes. The capability to measure and calibrate must parallel the emergence of new technology, new ranges, and new capabilities of military systems. Lack of new measurement capability impedes or blocks the successful exploitation of new technologies, especially in the movement from development laboratory to production to deployment. R&D efforts are essential within the DoD to pace these requirements, otherwise, these same new systems will suffer time delays, excessive cost, and increased risk due to unreliable test results in all phases of development, production, deployment and operation.

This program element may include necessary civilian pay expenses required to manage, execute and deliver 0702207F. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

Program is managed by Air Force Materiel Command, Agile Combat Support Directorate, Air Force Metrology Division (WNM).

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0702207F / *Depot Maintenance (Non-IF)*	

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	1.528	1.897	1.936	0.000	1.936
Current President's Budget	1.517	1.897	1.890	0.000	1.890
Total Adjustments	-0.011	0.000	-0.046	0.000	-0.046
• 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	-0.011	0.000			
• Other Adjustments	0.000	0.000	-0.046	0.000	-0.046

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Weapons Systems Measurement Standards	0.557	0.568	0.568
Description: Develop national measurement standards to support Air Force infrared / laser / electro-optical weapon systems and support equipment. ***FY 2019 Plans:*** Continued development of national measurement standards to support Air Force infrared / laser / electro-optical weapon systems and support equipment. ***FY 2020 Plans:*** Continue development of national measurement standards to support Air Force infrared / laser / electro-optical weapon systems and support equipment.			
Title: Electrical Measurements	0.000	0.000	0.000
Description: Develop standards for electrical measurements to support high accuracy electronic test equipment. ***FY 2019 Plans:*** Continued development of standards for electrical measurements to support high accuracy electronic test equipment. ***FY 2020 Plans:*** Continue development of standards for electrical measurements to support high accuracy electronic test equipment.			
Title: Radar Support/Communications	0.300	0.712	0.705

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0702207F / *Depot Maintenance (Non-IF)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: Develop standards for radar support, RF communication systems, and radar cross section range measurements. ***FY 2019 Plans:*** Developed standards for radar support, RF communication systems, and radar cross section range measurements. ***FY 2020 Plans:*** Continue development of standards for radar support, RF communication systems, and radar cross section range measurements. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease because of rate change.			
Title: Calibration ***Description:*** Develop improved calibration standards to support physical, mechanical, and electro-mechanical support equipment. ***FY 2019 Plans:*** Continued development of improved calibration standards to support physical, mechanical, and electro-mechanical support equipment. ***FY 2020 Plans:*** Continue development of improved calibration standards to support physical, mechanical, and electro-mechanical support equipment.	0.560	0.560	0.560
Title: Analytical Metrology ***Description:*** Develop standards, models, and procedures to support analytical metrology applications. ***FY 2019 Plans:*** Continued development of standards, models, and procedures to support analytical metrology applications. ***FY 2020 Plans:*** Continue development of standards, models, and procedures to support analytical metrology applications.	0.100	0.057	0.057
Accomplishments/Planned Programs Subtotals	1.517	1.897	1.890
Other Service Funding Adjustment	0.000	0.000	-
Air Force Subtotals	1.517	1.897	1.890

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0702207F / *Depot Maintenance (Non-IF)*

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

Primarily accomplished through intergovernmental transfer between the Department of Defense and other Federal Departments.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0702207F / *Depot Maintenance (Non-IF)*	**Project (Number/Name)** 673326 / *Precision Measurement & Calibration*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
National Institute of Standards & Technology	MIPR	AFMETCAL : Heath, OH	-	1.207	Aug 2018	1.486	Aug 2019	1.479	Aug 2020	-		1.479	Continuing	Continuing	1.200
Department of Defense	MIPR	AFMETCAL : Heath, OH	-	0.200	Aug 2018	0.200	Aug 2019	0.200	Aug 2020	-		0.200	Continuing	Continuing	0.200
Industry	SS/T&M	AFMETCAL : Heath, OH	-	0.110	Aug 2018	0.211	Aug 2019	0.211	Aug 2020	-		0.211	Continuing	Continuing	0.099
		Subtotal	-	1.517		1.897		1.890		-		1.890	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Subtotals	-	1.517		1.897		1.890		-		1.890	Continuing	Continuing	N/A
Other Service Funding Adjustment	-	0.000		0.000		-		-		-			-
Project Cost Totals	-	1.517		1.897		1.890		-		1.890	0.000	0.000	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0702207F / *Depot Maintenance (Non-IF)*	**Project (Number/Name)** 673326 / *Precision Measurement & Calibration*

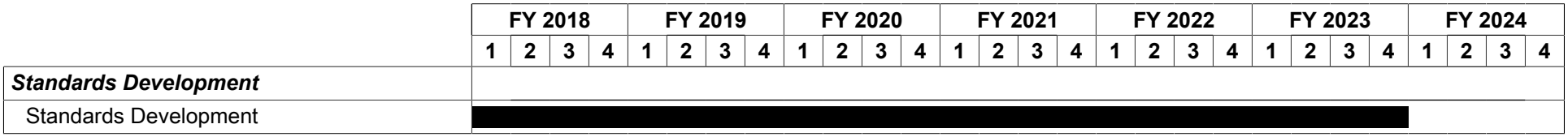

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0702207F / *Depot Maintenance (Non-IF)*	**Project (Number/Name)** 673326 / *Precision Measurement & Calibration*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Standards Development				
Standards Development	1	2018	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0708055F / *Maintenance, Repair & Overhaul System*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	28.726	50.933	10.311	0.000	10.311	34.561	22.027	0.000	0.000	176.823	323.381
675207: *Maintenence Repair and Overhaul*	0.000	28.726	50.933	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	79.659
675329: *MAINTENANCE REPAIR AND OVERHAUL INTIATIVE*	0.000	0.000	0.000	10.311	0.000	10.311	34.561	22.027	0.000	0.000	176.823	243.722
Program MDAP/MAIS Code: 523												

A. Mission Description and Budget Item Justification

NOTE
In FY2020 PE 0708055F, MROi efforts were transferred from Project 675207 to Project 675329, Maintenance, Repair & Overhaul Initiative, in order to improve transparency of this Business System Category II (BCAT II), formerly an ACAT I acquisition program.

Prior years funding $23.126M was executed in PE 0708610F

A. Mission Description and Budget Item Justification
MROi creates and integrate capability that plans, schedules and executes organic depot maintenance support functions critical to agile planning, optimized workload assignment, resource allocation and throughput, thereby increasing depot maintenance support to the warfighter.

FY20 funding will support the continued development and integration leading to planned Full Deployment Decision capabilities. The MROi implementer will continue to configure the Oracle suite; configure associated Commercial-Off-The-Shelf (COTS) support software; and develop Reports, Interfaces, Conversions and Extensions (RICE) software. Collaborative and combined development and operational testing is being performed iteratively throughout the development, configuration, integration, and deployment using the Oracle Unified Methodology (OUM) which is inherently agile to achieve the benefits of the Agile Software Development Methodology. Funds will be used to perform studies and innovative integration efforts for common technology capabilities such as cloud migration, technology development, and mobile applications.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0708055F / *Maintenance, Repair & Overhaul System*

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	31.677	50.933	37.625	0.000	37.625
Current President's Budget	28.726	50.933	10.311	0.000	10.311
Total Adjustments	-2.951	0.000	-27.314	0.000	-27.314
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-2.951	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	-27.314	0.000	-27.314

Change Summary Explanation

The FY 2020 funding request was reduced by $10.7 M to account for the availability of prior year execution balances. As a result of the delay in the System Implementer (SI) contract award. MROi was left with unplanned excess funds in prior years.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0708055F / *Maintenance, Repair & Overhaul System*	Project (Number/Name) 675207 / *Maintenence Repair and Overhaul*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675207: *Maintenence Repair and Overhaul*	0.000	28.726	50.933	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	79.659
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2018 PE 0708610F, Project 675207, MROi efforts were transferred to PE 0708055F, Project 675207, Maintenance Repair & Overhaul, in order to improve transparency of this Business System Category II (BCAT II), formerly an ACAT I acquisition program.

Prior Years Funding $23.126M was executed in PE 0708610F.

As a result of the transition of Defense Business Systems from DoDI 5000.02 to DoDI 5000.75, MROi was reclassified to a BCAT II program as reflected in the 11 APR 2018 MROi Milestone B ADM.

A. Mission Description and Budget Item Justification

Maintenance, Repair and Overhaul (MROi) is an enterprise resource planning IT system that provides an integrated capability for planning, scheduling, and executing organic depot maintenance to support agile planning, optimized workload assignment and resource allocation and throughput, thereby increasing depot maintenance support to the warfighter. Funds will be used to perform studies and innovative integration efforts for common technology capabilities such as cloud migration, technology development and mobile application.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver MROi system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: FY 2019 PLANS	28.726	50.933	-
Description: The MROi transformation effort will create an integrated capability for planning, scheduling, executing organic depot maintenance to support agile planning, optimizing workload assignment and resource allocation. ***FY 2019 Plans:*** - Develop and Integrate MROi planned releases, leading to a planned Full Deployment Decision/Full Deployment ATP. - Continue to configure the Oracle suite; configure associated Commercial-Off-The-Shelf (COTS) support software; develop Reports, Interfaces, Conversions, and Extensions (RICE) software; and develop training materials.			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0708055F / *Maintenance, Repair & Overhaul System*	**Project (Number/Name)** 675207 / *Maintenence Repair and Overhaul*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Begin Development Testing (DT) activities			
FY 2019 to FY 2020 Increase/Decrease Statement: Decrease due to transfer to project 675329			
Accomplishments/Planned Programs Subtotals	28.726	50.933	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPAF 03 Line Item 834480: *Maintenance, Repair and Overhaul Initiative*	-	12.207	1.912	-	1.912	0.000	0.000	-	-	0.000	14.119

Remarks

D. Acquisition Strategy

MROi will use an incremental build-release acquisition strategy to deliver capability. The program used a competitive, best value strategy to select a system implementer utilizing the existing NETCENTS-2 Small Business Application Services contract. The task order for increment 1 was awarded 11 Jul 2018. Hosting Infrastructure will be provided through the AFLCMC/HNI CIE effort, Common Computing Environment, hosted at DISA.

•Development Contract Strategy
-Directed use of NETCENTS II Small Business Application Services IDIQ
--Limited competition to preselected group of small businesses
--Competitive, Best Value Full Trade-off procedures -CPIF (Labor), CPFF (Training, Sustainment); CR (Travel, ODCs); FFP (Level 2 & 3 Support)
--CPIF contract type with cost, schedule, and performance incentives
--Own technical baseline
•Sustainment Contract Strategy
-TBD

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0708055F / *Maintenance, Repair & Overhaul System*	**Project (Number/Name)** 675207 / *Maintenence Repair and Overhaul*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Maintenance, Repair and Overhaul Initiative: Configuration System Implementer	C/Various	NETCENTS-2 : WPAFB, OH	0.000	7.368	Jul 2018	12.983	Jul 2019	-		-		-	0.000	20.351	32.099
Maintenance, Repair and Overhaul Initiative: Software Development	Various	Various : WPAFB, OH	0.000	0.187	May 2018	0.101	Jan 2019	-		-		-	0.000	0.288	-
Maintenance, Repair and Overhaul Initiative: Hosting Environtment Support	MIPR	DISA : St. Louis, MO	0.000	0.005	Mar 2018	0.012	Jan 2019	-		-		-	0.000	0.017	-
Maintenance, Repair and Overhaul Initiative: Capabilities Integration Environment (CIE)	MIPR	AFLCMC/HNII : Gunter Annex, AL	0.000	0.086	Feb 2018	0.089	Feb 2019	-		-		-	0.000	0.175	-
Maintenance, Repair and Overhaul Initiative: Legacy Systems Interface Development	C/CPAF	Various : WPAFB, OH	0.000	0.000		5.586	Jan 2019	-		-		-	0.000	5.586	-
		Subtotal	0.000	7.646		18.771		-		-		-	0.000	26.417	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Maintenance, Repair and Overhaul Initiative: ISP Support	C/CPFF	Copper River : Gunter Annex, AL	0.000	0.197	Mar 2018	0.307	Mar 2019	-		-		-	0.000	0.504	-
Maintenance, Repair and Overhaul Initiative: FFRDC Support	SS/FFP	MITRE : WPAFB, OH	0.000	0.987	Mar 2018	1.207	Mar 2019	-		-		-	0.000	2.194	-
Maintenance, Repair and Overhaul Initiative: Oracle Support	C/Various	Oracle : WPAFB, OH	0.000	0.880	Jan 2018	1.045	Jan 2019	-		-		-	0.000	1.925	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0708055F / *Maintenance, Repair & Overhaul System*	**Project (Number/Name)** 675207 / *Maintenence Repair and Overhaul*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Maintenance, Repair and Overhaul Initiative: Common Computing Environment	C/Various	Leidos : WPAFB, OH	0.000	12.009	Jan 2019	19.372	Jan 2019	-		-		-	0.000	31.381	-
Maintenance, Repair and Overhaul Initiative: PMO Oracle Support - DDC	SS/CPAF	Oracle : WPAFB, OH	0.000	0.976	Mar 2018	1.648	Jan 2019	-		-		-	0.000	2.624	-
Maintenance, Repair and Overhaul Initiative: Field Assistance Service (FAS)	TBD	Not specified. : WPAFB, OH	0.000	0.000		0.179	Feb 2019	-		-		-	0.000	0.179	-
		Subtotal	0.000	15.049		23.758		-		-		-	0.000	38.807	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Maintenance, Repair and Overhaul Initiative: Test Support	MIPR	DISA : St. Louis, MO	0.000	0.055	Mar 2018	1.370	Dec 2018	-		-		-	0.000	1.425	-
Maintenance, Repair and Overhaul Initiative: Joint Interoperability Test Command (JITC) Support	MIPR	GSA : WPAFB, OH	0.000	0.025	Mar 2018	0.023	Mar 2019	-		-		-	0.000	0.048	-
Maintenance, Repair and Overhaul Initiative: LDTO Test Support (Cybersecurity)	MIPR	DISA : St. Louis, MO	0.000	0.260	Jan 2018	0.356	Jan 2019	-		-		-	0.000	0.616	-
Maintenance, Repair and Overhaul Initiative: Test Support Hosting Environment	MIPR	DISA : St. Louis, MO	0.000	3.479	Mar 2018	2.750	Mar 2019	-		-		-	0.000	6.229	-
		Subtotal	0.000	3.819		4.499		-		-		-	0.000	8.318	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0708055F / *Maintenance, Repair & Overhaul System*	**Project (Number/Name)** 675207 / *Maintenence Repair and Overhaul*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Maintenance, Repair and Overhaul Initiative: ETASS Support	C/CPFF	OASIS : WPAFB, OH	0.000	1.128	Mar 2018	2.469	Mar 2019	-		-		-	0.000	3.597	-
Maintenance, Repair and Overhaul Initiative: PASS Support	C/Various	BTAS : WPAFB, OH	0.000	0.526	Feb 2018	0.542	Feb 2019	-		-		-	0.000	1.068	-
Maintenance, Repair and Overhaul Initiative: EPASS	C/CPFF	Various : WPAFB, OH	0.000	0.329	Jun 2018	0.389	Jun 2019	-		-		-	0.000	0.718	-
Maintenance, Repair and Overhaul Initiative: PMA	C/CPFF	Various : WPAFB, OH	0.000	0.229	Sep 2018	0.505	Sep 2019	-		-		-	0.000	0.734	-
		Subtotal	0.000	2.212		3.905		-		-		-	0.000	6.117	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	28.726		50.933		-		-		-	0.000	79.659	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0708055F / *Maintenance, Repair & Overhaul System*	**Project (Number/Name)** 675207 / *Maintenence Repair and Overhaul*

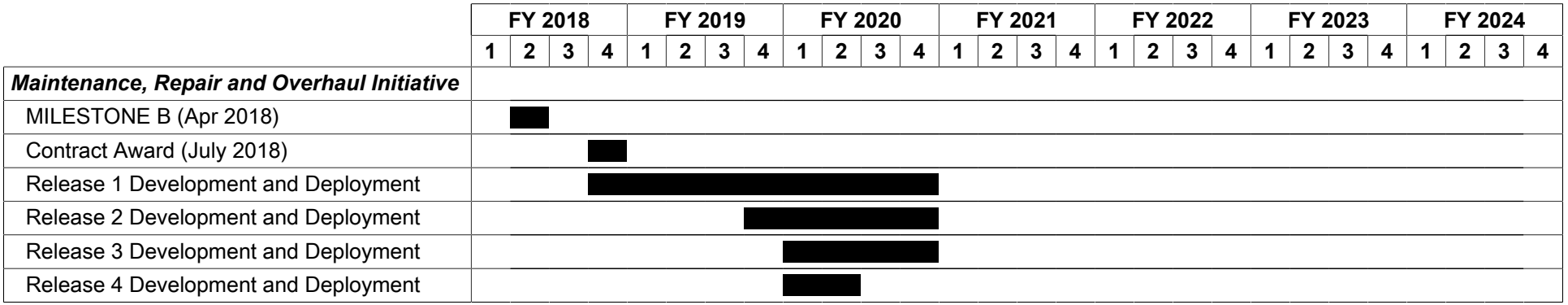

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0708055F / *Maintenance, Repair & Overhaul System*	**Project (Number/Name)** 675207 / *Maintenence Repair and Overhaul*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Maintenance, Repair and Overhaul Initiative				
MILESTONE B (Apr 2018)	2	2018	2	2018
Contract Award (July 2018)	4	2018	4	2018
Release 1 Development and Deployment	4	2018	4	2020
Release 2 Development and Deployment	4	2019	4	2020
Release 3 Development and Deployment	1	2020	4	2020
Release 4 Development and Deployment	1	2020	2	2020

Note

MROi BPAC for FY2019 and prior years is 675207; BPAC for FY2020 and out years is 675329

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0708055F / *Maintenance, Repair & Overhaul System*	Project (Number/Name) 675329 / *MAINTENANCE REPAIR AND OVERHAUL INTIATIVE*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675329: *MAINTENANCE REPAIR AND OVERHAUL INTIATIVE*	0.000	0.000	0.000	10.311	0.000	10.311	34.561	22.027	0.000	0.000	176.823	243.722
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2020 PE 0708055, Project 675207, MROi efforts will transfer to PE 0708055F, Project 675329, Maintenance, Repair & Overhaul System, in order to improve transparency of this Business System Category II (BCAT II), formerly an ACAT I acquisition program.

FY18/19 funds of $82.610 M will be executed from PE 0708055F, Project 675207. Prior Year Funding $23.126M was executed in PE 0708610F.

As a result of the transition form DoDI 5000.02 to DoDI 5000.75, MROi was reclassified to a BCAT II program as reflected in the 11 Apr 2018 MROi Milestone B ADM.

A. Mission Description and Budget Item Justification

Maintenance, Repair and Overhaul (MROi) is an enterprise resource planning IT system that provides an integrated capability for planning, scheduling, and executing organic depot maintenance to support agile planning, optimized workload assignment and resource allocation and throughput, thereby increasing depot maintenance support to the warfighter.

FY 2020 funding will support the development and integration of MROi, leading to a planned Full Deployment Decision/Full Deployment Authority to Proceed (ATP). Additionally, funding will support advisory and assistance services necessary to assist in the planning, development, execution, and reporting of system program office duties and responsibilities. Funding may also support MROi unique/non-common capabilities to be hosted in and maintained by the Common Computing Environment managed by AFLCMC/HNI Capabilities Integration Environment(CIE). The MROi implementer will continue to configure the Oracle suite; configure associated Commercial-Off-The-Shelf (COTS) support software; develop Reports, Interfaces, Conversions and Extensions (RICE) software; and develop training materials. Development Testing (DT) activities will continue. Collaborative and combined development and operational testing is being performed iteratively throughout the development, configuration, integration, and deployment using the Oracle Unified Methodology (OUM) which is inherently agile to achieve the benefits of the Agile Software Development Methodology.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver MROi system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: 3600 / 7	-	0.000	10.311

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0708055F / *Maintenance, Repair & Overhaul System*	**Project (Number/Name)** 675329 / *MAINTENANCE REPAIR AND OVERHAUL INTIATIVE*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: The MROi transformation effort will create an integrated capability for planning, scheduling, executing organic depot maintenance to support agile planning, optimizing workload assignment and resource allocation. ***FY 2019 Plans:*** Not Applicable ***FY 2020 Plans:*** - Will support the continued development and integration of MROi planned releases, leading to a planned Full Deployment Decision/Full Deployment ATP. - Will continue to configure the Oracle suite; configure associated Commercial-Off-The-Shelf (COTS) support software; develop Reports, Interfaces, Conversions and Extensions (RICE) software; and develop training materials. - Will continue Development Testing (DT) activities. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to transfer from Project 675207			
Accomplishments/Planned Programs Subtotals	-	0.000	10.311

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPAF 03 834480: *Maintenance Repair & Overhaul Initiative*	-	12.207	1.912	-	1.912	-	-	-	-	14.119	28.238

Remarks

D. Acquisition Strategy

MROi will use an incremental build-release acquisition strategy to deliver capability. The program used a competitive, best value strategy to select a system implementer utilizing the existing NETCENTS-2 Small Business Application Services contract. The task order for increment 1 was awarded 11 Jul 2018. Hosting Infrastructure will be provided through the AFLCMC/HNI CIE effort, Common Computing Environment, hosted at DISA.

•Development Contract Strategy
-Directed use of NETCENTS II Small Business Application Services IDIQ
--Limited competition to preselected group of small businesses
--Competitive, Best Value Full Trade-off procedures -CPIF (Labor), CPFF (Training, Sustainment); CR (Travel, ODCs); FFP (Level 2 & 3 Support)
--CPIF contract type with cost, schedule, and performance incentives

--Own technical baseline
--Tech Stack Licenses
•Sustainment Contract Strategy
-TBD

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0708055F / *Maintenance, Repair & Overhaul System*	**Project (Number/Name)** 675329 / *MAINTENANCE REPAIR AND OVERHAUL INTIATIVE*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Maintenance, Repair and Overhaul Initiative: Configuration System Implementer	C/Various	NETCENTS-2 : WPAFB, OH	0.000	-		-		0.784	Jul 2020	-		0.784	0.000	0.784	-
Maintenance, Repair and Overhaul Initiative: Software Development	C/Various	Various : WPAFB, OH	0.000	-		-		0.032	May 2020	-		0.032	0.000	0.032	-
Maintenance, Repair and Overhaul Initiative: Hosting Environment Support	MIPR	DISA : ST Louis, MO	0.000	-		-		0.004	Mar 2020	-		0.004	0.000	0.004	-
Maintenance, Repair and Overhaul Initiative: Capabilities Integration Environment (CIE)	MIPR	AFLCMC/HNII : Gunter Annex, AL	0.000	-		-		0.030	Feb 2020	-		0.030	0.000	0.030	-
Maintenance, Repair and Overhaul Initiative: Legacy Systems Interface Development	C/CPAF	Various : WPAFB, OH	0.000	-		-		1.150	Aug 2020	-		1.150	0.000	1.150	-
		Subtotal	0.000	-		-		2.000		-		2.000	0.000	2.000	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Maintenance, Repair and Overhaul Initiative: ISP Support	C/CPFF	Bowhead : Alexandria, VA	0.000	-		-		0.175	Mar 2020	-		0.175	0.000	0.175	-
Maintenance, Repair and Overhaul Initiative: FFRDC Support	C/CPFF	MITRE : WPAFB, OH	0.000	-		-		0.688	Mar 2020	-		0.688	0.000	0.688	-
Maintenance, Repair and Overhaul Initiative: Oracle Support	C/Various	Oracle : WPAFB, OH	0.000	-		-		0.595	Jan 2020	-		0.595	0.000	0.595	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0708055F / *Maintenance, Repair & Overhaul System*	Project (Number/Name) 675329 / *MAINTENANCE REPAIR AND OVERHAUL INTIATIVE*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Maintenance, Repair and Overhaul Initiative: PMO Oracle Support - DDC	C/CPAF	Oracle : WPAFB, OH	0.000	-		-		0.939	Jan 2020	-		0.939	0.000	0.939	-
Maintenance, Repair and Overhaul Initiative: Field Assistance Service (FAS)	TBD	TBD : WPAFB, OH	0.000	-		-		0.103	Feb 2020	-		0.103	0.000	0.103	-
		Subtotal	0.000	-		-		2.500		-		2.500	0.000	2.500	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Maintenance, Repair and Overhaul Initiative: Test Support	MIPR	DISA : St. Louis, MO	0.000	-		-		0.593	Oct 2019	-		0.593	0.000	0.593	-
Maintenance, Repair and Overhaul Initiative: Joint Interoperability Test Command (JITC) Support	MIPR	GSA : WPAFB, OH	0.000	-		-		0.094	Mar 2020	-		0.094	0.000	0.094	-
Maintenance, Repair and Overhaul Initiative: LDTO Test Support (Cybersecurity)	MIPR	DISA : St. Louis, MO	0.000	-		-		0.132	Jan 2020	-		0.132	0.000	0.132	-
Maintenance, Repair and Overhaul Initiative: Test Support Hosting Environment	MIPR	DISA : St. Louis, MO	0.000	-		-		1.281	Mar 2020	-		1.281	0.000	1.281	-
		Subtotal	0.000	-		-		2.100		-		2.100	0.000	2.100	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0708055F / *Maintenance, Repair & Overhaul System*	**Project (Number/Name)** 675329 / *MAINTENANCE REPAIR AND OVERHAUL INTIATIVE*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Maintenance, Repair and Overhaul Initiative: ETASS Support	C/CPFF	OASIS : WPAFB, OH	0.000	-		-		2.346	Mar 2020	-		2.346	0.000	2.346	-
Maintenance, Repair and Overhaul Initiative: PASS Support	C/Various	BTAS : WPAFB, OH	0.000	-		-		0.516	Jun 2020	-		0.516	0.000	0.516	-
Maintenance, Repair and Overhaul Initiative: EPASS	C/CPFF	Various : WPAFB, OH	0.000	-		-		0.369	Sep 2020	-		0.369	0.000	0.369	-
Maintenance, Repair and Overhaul Initiative: PMA	C/CPFF	Various : WPAFB, OH	0.000	-		-		0.480	Sep 2020	-		0.480	0.000	0.480	-
		Subtotal	0.000	-		-		3.711		-		3.711	0.000	3.711	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	-		0.000		10.311		-		10.311	0.000	10.311	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0708055F / *Maintenance, Repair & Overhaul System*	**Project (Number/Name)** 675329 / *MAINTENANCE REPAIR AND OVERHAUL INTIATIVE*

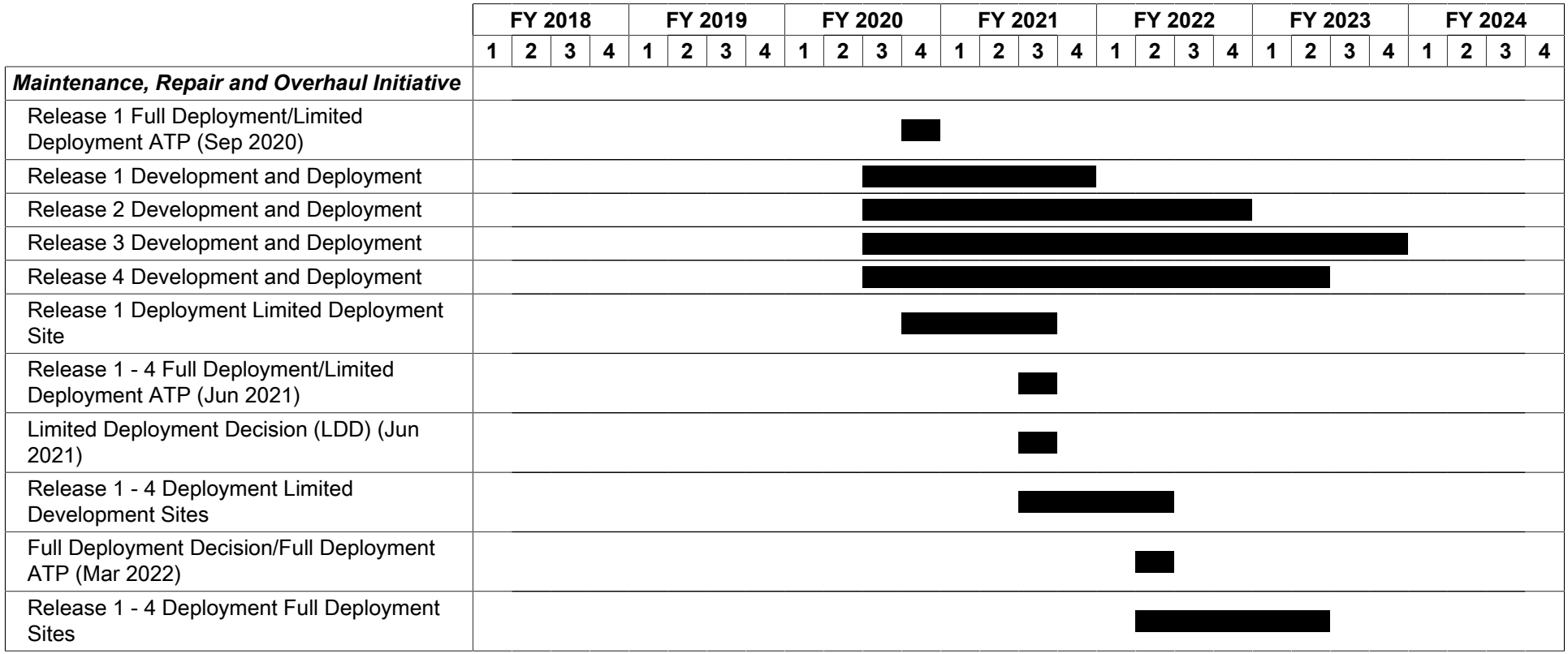

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0708055F / *Maintenance, Repair & Overhaul System*	**Project (Number/Name)** 675329 / *MAINTENANCE REPAIR AND OVERHAUL INTIATIVE*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Maintenance, Repair and Overhaul Initiative				
Release 1 Full Deployment/Limited Deployment ATP (Sep 2020)	4	2020	4	2020
Release 1 Development and Deployment	3	2020	4	2021
Release 2 Development and Deployment	3	2020	4	2022
Release 3 Development and Deployment	3	2020	4	2023
Release 4 Development and Deployment	3	2020	2	2023
Release 1 Deployment Limited Deployment Site	4	2020	3	2021
Release 1 - 4 Full Deployment/Limited Deployment ATP (Jun 2021)	3	2021	3	2021
Limited Deployment Decision (LDD) (Jun 2021)	3	2021	3	2021
Release 1 - 4 Deployment Limited Development Sites	3	2021	2	2022
Full Deployment Decision/Full Deployment ATP (Mar 2022)	2	2022	2	2022
Release 1 - 4 Deployment Full Deployment Sites	2	2022	2	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0708610F / *Logistics Information Technology (LOGIT)*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	23.332	13.479	16.065	0.000	16.065	33.247	52.865	72.525	57.803	Continuing	Continuing
675207: *Logistics IT System Modernization*	0.000	23.332	13.479	16.065	0.000	16.065	33.247	52.865	72.525	57.803	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 7, PE 0708610F, project 675207, Enhanced Technical Information Management System Enhancements (ETIMS Enhancements), is a new start.
This program, BA 7, PE 0708610F, project 675207, Transformation Capability Initiative - Supply Capability Initiative (SCI), is a new start.

A. Mission Description and Budget Item Justification

The AF requires an integrated logistics capability that provides timely, accurate and reliable information to decision makers at all levels of command and across the full range of military operations.

FIAR and Software Upgrades:

- The remediation and modification of core logistics systems is necessary for the AF to meet statutory Financial Improvement Audit Readiness (FIAR) requirements and align with the Joint Chiefs of Staff J-4 Concept for Logistics, and the AF Portfolio Board's approved Logistics Flight Plan. The AF must concurrently sustain and modify identified logistics systems to achieve FIAR remediation by the statutory deadline; execute software upgrades to reduce high operating costs and meet evolving operational demands; implement statutory compliance requirements; improve system performance; and enable system consolidation efforts that lower the cyber threat space and reduce long-term portfolio costs.

- Identified systems include, but are not limited to, the Integrated Logistics System-Supply (ILS-S), Commercial Asset Visibility - Air Force (CAV-AF) Enhanced Technical Information Management System (ETIMS), Integrated Maintenance Data System (IMDS), Reliability and Maintainability Information System (REMIS), and Stock Control System (SCS). Additional logistics system may be included as financial audits are completed and system consolidation efforts mature.

Transformation:

- The AF must transform its logistics business processes and transition away from using numerous custom stovepipe systems and processes that perform similar tasks. Eliminating process redundancies across the logistics enterprise will enable the AF to execute more secure, resilient, efficient, cost-effective and integrated logistics. The objective of transformation is to conduct Business Process Re-engineering (BPR) to identify and eliminate overlaps in business processes across core logistics systems and, where appropriate, implement new IT systems that employ best commercial practices and modern cloud-based architectures.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0708610F / *Logistics Information Technology (LOGIT)*

- The AF will take full advantage of the flexibilities provided by DoDI 5000.75, Business Systems Requirements and Acquisition guidance, as well as Agile development methodologies to identify requirements across the spectrum of Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, Facilities and Policy (DOTMLPF-P); and to acquire and deploy approved material solutions in the most efficient and effective manner possible. The Business Capability Acquisition Cycle (BCAC) identifies five phases: Capability Need Identification; Business Solution Analysis; Business System Functional Requirements and Acquisition Planning; Business System Acquisition, Testing, and Deployment; and, Capability Support. These phases are structured to optimize joint responsibility of functional and acquisition activities leading to the successful delivery of business capability with an emphasis on acquisition of business systems aligned to commercial best practices utilizing commercial off-the-shelf (COTS) and government off-the-shelf (GOTS) solutions, to the extent possible.

- The AF logistics enterprise is comprised of multiple overarching functional areas, to include base- and depot-level maintenance, end-to-end supply chain management, and predictive analysis and forecasting. The AF will standardize its business processes within each major logistics functional area through Transformational Capability Initiatives (CIs). These CIs include, but are not limited to: Maintenance, Repair and Overhaul (MROi), Item Master, Supply Chain Management (SCM), and Product Lifecycle Management (PLM). There may be one or more specific initiatives aligned to each of the major CI areas referenced above.

Transformation Capability Initiatives:

- Item Master Logistics Capability Initiative (IMLCI) provides the capability to manage comprehensive, accurate, reliable item master data (e.g., accurate identification and authorization of owners and users of items). SCM Item Master is a key component of the Air Force (AF) Logistics Capability Transformation Plan. It will provide Item standardization and configuration management from a single authoritative source, ensuring foundational logistics processes are executed in concert to support the A4 logistics baseline. Item Master will enable key integration and transformation capabilities, including IUID association to business transactions; streamlined management of part item attributes across supply, finance, engineering, technology, transportation, maintenance, and vendor communities; and provide translation capabilities between functional and technical business communities and systems.

- SCM Supply Capability Initiative is focused on enabling simplified, standardized processes to fundamentally enhance the business operations and provide total asset visibility across the supply chain. These improvements have been identified in the USAF Logistics Capabilities Transformation Plan.

- SCM Field Maintenance will improve the AF field maintenance capabilities across Mission Generation Network (MGN) and Repair Network (RN) (e.g. propulsion, avionics, command and control (C2) enabler systems, cyber systems, communications-electronics & simulation, Precision Measurement Equipment Laboratory (PMEL), etc.) including the planning, scheduling, execution and oversight of functional deficiencies incurred over the past 10 years due to lack of prioritized funding and failure of the previous enterprise-wide modernization approach.

- PLM enables AF engineering/logistics communities to define, track, protect and manage product data for AF weapon systems and equipment. The AF requires the ability to control configuration of the product throughout the life of the asset. Standardized configuration control will ensure validity, accuracy, reliability, currency, and security of the product information, which will increase weapon system readiness by decreasing costs to manage, protect, store and deliver product information.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0708610F / *Logistics Information Technology (LOGIT)*

- Funds will be used to perform innovative integration efforts for common technology capabilities such as cloud migration, technology development and mobile application.

- This program element may include necessary civilian pay expenses required to manage, execute, and deliver our integrated logistics capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 06065833F.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	33.344	13.787	27.623	0.000	27.623
Current President's Budget	23.332	13.479	16.065	0.000	16.065
Total Adjustments	-10.012	-0.308	-11.558	0.000	-11.558
• Congressional General Reductions	-3.192	-0.308			
• 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	-5.832	0.000			
• SBIR/STTR Transfer	-0.988	0.000			
• Other Adjustments	0.000	0.000	-11.558	0.000	-11.558

Change Summary Explanation

- FY18 - PE 0708610F received $3.000 Congressional Mark, $0.192M FFRDC Congressional reductions, $0.988M SBIR reduction, and $5.832M was below threshold reprogrammed.
- FY19 - PE 0708610F received $0.308M FFRDC Congressional reduction.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Integrated Logistics Support - Supply Enhancements (ILS-S Enhancements)	0.000	0.600	0.600

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0708610F / *Logistics Information Technology (LOGIT)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: Modify ILS-S to meet existing and future compliance requirements. Support Logistics Application Rationalization. Modifications may include system changes to subsume functionality of other systems in support of terminating duplicate capability and systems, as well as enhancements to meet compliance requirements such as Item Unique Identification (IUID), Defense Logistics Marking Standards (DLMS), and enhancements for information technology modernization. ***FY 2019 Plans:*** - Begin directed subsumption activities and enhancements. ***FY 2020 Plans:*** - Will continue directed subsumption activities and enhancements.			
Title: Air Force Equipment Management System Financial Improvement Audit Readiness (AFEMS FIAR) ***Description:*** AFEMS will satisfy multiple FIAR requirements activities to establish, document and test/assess system audit readiness. Continue all audit readiness activities to support future FIAR (FISCAM/Blue Book) requirements. These requirements must be accomplished and fully executed to not only ensure program success, but also to meet mandated FIAR compliance. Additionally, these requirements will be fielded with multiple SW releases, as identified on the R-4A schedule profile. ***FY 2019 Plans:*** - Effort was halted in Mar 2018 due to the greater economic feasibility to use the Defense Property Accountability System (DPAS), the future Accountable Property System of Record. Effort will be decommissioned in FY19. ***FY 2020 Plans:*** - Effort was halted in Mar 2018 due to the greater economic feasibility to use the Defense Property Accountability System (DPAS), the future Accountable Property System of Record. Effort will be decommissioned in FY19.	0.000	0.000	0.000
Title: Enhanced Technical Information Management System Enhancements (ETIMS Enhancements) ***Description:*** Further modifications to ETIMS software to integrate additional enhancements satisfying requirements contained in the Functional Requirements Document(FRD). ETIMS requires modernization to incorporate enhancements into the AF Enterprise Technical Order (TO) Management System, and future ETIMS development falls into this category. ETIMS enhancements is a development effort that will satisfy Nuclear Enterprise eTO Content Management Support, Large File On-line eTO viewing (cloud based), AFTO 43 - Automate Technical Order Distribution Office (TODO) Account Request, and deploying electronic Technical Orders (eTOS) to MacBook and sync to IPADS. ***FY 2019 Plans:***	0.000	0.000	0.600

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0708610F / *Logistics Information Technology (LOGIT)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Effort planned to begin in FY20. ***FY 2020 Plans:*** - Will begin preparations for new development effort, continuing modification of ETIMS software. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** - Funding increased due to effort planned to begin development in FY20.			
Title: Enhanced Technical Information Management System Software Upgrade (ETIMS SUP) ***Description:*** Modify ETIMS software to integrate additional enhancements satisfying requirements contained in the Functional Requirements Document(FRD). ETIMS requires modernization to incorporate enhancements into the AF Enterprise Technical Order (TO) Management System, and the current ETIMS release that is being worked falls into this category. ETIMS is a dev/ mod effort that will satisfy the Management of Computer Program Identification Number (CPINs), archive digital TOs, interface System of record Time Compliance Technical Order (TCTO) data with REMIS, manage and track to change requests, and store and distribute Interactive Electronic Technical Manuals (IETMs). ***FY 2019 Plans:*** - Complete software modification effort and deploying software. ***FY 2020 Plans:*** - Effort complete in FY19. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** - Funding decreased due to effort's completion in FY19.	6.604	0.800	0.000
Title: Integrated Maintenance Data System - Central Database Software Upgrade Program Version 3.0 (IMDS CDB SUP) ***Description:*** Modify IMDS CDB SUP v3.0 and associated requirements to comply with statutory/regulatory technical improvements (Internet Protocol Version 6, Item Unique Identification, etc), and enable an infrastructure migration to significantly reduce annual operating costs of critical maintenance documentation system. ***FY 2019 Plans:*** - Award development contract for IMDS CDB SUP capabilities. ***FY 2020 Plans:*** - Continuation of development effort.	0.000	0.500	0.500
Title: Integrated Maintenance Data System Central Database Maintenance Scheduling Application Tool Software Upgrade (IMDS CDB MSAT SUP)	2.765	0.700	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0708610F / *Logistics Information Technology (LOGIT)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: Modify IMDS Central Database (CDB) software to enable the subsumption of the Maintenance Scheduling Application Tool (MSAT) functionality into IMDS CDB, reducing the number of core logistics systems required to document field base level maintenance. ***FY 2019 Plans:*** - Complete deployment. ***FY 2020 Plans:*** - Effort complete in FY19. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** - Funding decreased due to effort's completion in FY19.			
Title: Reliability and Maintainability Information System Software Upgrade (REMIS SUP) ***Description:*** Complete development program (software upgrade and move into DISA or other common computing environment). Includes Upgrade (JAVA EE), and transition to DISA and common computing environment. ***FY 2019 Plans:*** - Complete development program (moving into DISA), utilizing PMO support contractors while completing outstanding CCE environment actions. ***FY 2020 Plans:*** - Effort complete in FY19. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** - Funding decreased due to effort's completion in FY19.	4.364	1.100	0.000
Title: Reliability and Maintainability Information System Enhancements (REMIS Enhancements) ***Description:*** Modify REMIS to meet existing and future compliance requirements. Support Logistics Application Rationalization. Modifications may include system changes to subsume functionality of other systems in support of terminating duplicate capability and systems, as well as enhancements to meet compliance requirements such as Item Unique Identification (IUID), Defense Logistics Marking Standards (DLMS), and enhancements for information technology modernization. ***FY 2019 Plans:*** - Begin directed subsumption activities and enhancements. ***FY 2020 Plans:***	0.000	0.600	0.600

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0708610F / *Logistics Information Technology (LOGIT)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Will continue directed subsumption activities and enhancements.			
Title: Stock Control System Financial Improvement and Audit Readiness (SCS FIAR) ***Description:*** SCS FIAR PMO to perform multiple FIAR Congressional requirements activities to establish, document and test/ assess system audit readiness. PMO supports all audit readiness activities for future FIAR (TFM Chap 500) requirements. These requirements must be accomplished and fully executed to not only ensure program success, but also to meet mandated FIAR compliance. Additionally, these requirements will be fielded with multiple SW releases, as identified in Exhibit R-4, RDT&E Schedule Profile and R-4A, RDTE Schedule Details, for SCS FIAR. ***FY 2019 Plans:*** - Complete modification of software to achieve FIAR compliance. ***FY 2020 Plans:*** - Effort complete in FY19. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** - Funding decreased due to efforts completion in FY19.	2.332	0.090	0.000
Title: Transformation Capability Initiative - Item Master Logistics Capability Initiative (IMLCI) ***Description:*** The IMLCI will provide comprehensive Item Catalog and Provisioning functions for the Logistics business systems, and will replace the Item Management Control System (IMCS) suite of legacy systems, at a minimum. IMLCI will be the central repository for the Item core business objects, providing standardization of Item cataloging processes, structure, attributes, propagation, and standardized views for all applicable Item types. Additionally, IMLCI will receive product structure input from an engineering Product Lifecycle Management (PLM) type system. Item Master Logistics Capability Initiative (IMLCI) will contain the Item data that is the core underlying information for each Capability Initiative (CI), and as such will integrate with many logistics enterprise systems. IMLCI has been nominated as a NDAA Section 873, "Agile or Iterative Development Methods to Tailor Major Software-Intensive Warfighting Systems and Defense Business Systems pilot program." ***FY 2019 Plans:*** - Finalize requirements for the Acquisition ATP (ATP 3) approval - Begin development ***FY 2020 Plans:*** - Will achieve Limited Deployment ATP (ATP 4) ***FY 2019 to FY 2020 Increase/Decrease Statement:***	2.997	7.439	11.615

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0708610F / *Logistics Information Technology (LOGIT)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Funding increased due to full development efforts scheduled to begin in FY20.			
Title: Transformation Capability Initiative - Supply Capability Initiative (SCI) ***Description:*** SCI is focused on enabling simplified, standardized processes to fundamentally enhance the business operations and provide total asset visibility across the supply chain. These improvements have been identified in the USAF Logistics Capabilities Transformation Plan. ***FY 2019 Plans:*** - Effort planned to begin in FY20. ***FY 2020 Plans:*** - Will stand up program management office to begin preparations for an Acquisition ATP in August 2020. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** - Funding increased due to effort planned to begin development in FY20.	-	0.000	0.500
Title: Transformation Capability Initiative - Supply Chain Management - Field Maintenance Initiative (SCM Field MX) ***Description:*** SCM Field Maintenance will improve the AF field maintenance capabilities across Mission Generation Network (MGN) and Repair Network (RN) (e.g. propulsion, avionics, C2 enabler systems, cyber systems, communications-electronics & simulation, Precision Measurement Equipment Laboratory (PMEL), etc.) including the planning, scheduling, execution and oversight of functional deficiencies incurred over the past 10 years due to lack of prioritized funding and failure of the previous enterprise-wide modernization approach. ***FY 2019 Plans:*** - Re-baselined to begin development in FY22. ***FY 2020 Plans:*** - Re-baselined to begin development in FY22.	0.000	0.000	0.000
Title: Transformation Capability Initiative - Product Lifecycle Management (PLM) ***Description:*** PLM will enable AF engineering/logistics communities to define, track, protect and manage product data for AF weapon systems and equipment. It will also enable collaboration by connecting field users with Center engineers, original equipment manufacturers with equipment specialists and internal/external stakeholders, and modernize the means used to manage PLM information from cradle to grave. ***FY 2019 Plans:***	4.270	0.000	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0708610F / *Logistics Information Technology (LOGIT)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Re-baselined to begin in FY21. ***FY 2020 Plans:*** - Re-baselined to begin in FY21.			
Title: Emerging Financial Improvement and Audit Readiness (Emerging FIAR) ***Description:*** Modify operational Logistics software systems to incorporate emerging FIAR requirements. These requirements are the result of on-going analysis of the Treasury Financial Management (TFM) Chapter 9500 as directed by OMB A-123 appendix D, and the DoD FMR volume 1, chapter 3. The results are identified and documented systems deficiencies that can only be satisfied via a material solution. ***FY 2019 Plans:*** - Continue FIAR remediation efforts of those programs with deficiencies documented as a result of on-going analyses of the latest TFM Chapter 9500 review. ***FY 2020 Plans:*** - Will continue FIAR remediation efforts of those programs with deficiencies documented as a result of on-going analyses of the latest TFM Chapter 9500 review.	0.000	0.450	0.450
Title: Logistics Strike Teams (Strike Teams) ***Description:*** Rapidly transform the Logistics IT landscape and improve operational command and control by consolidating and collapsing 359 systems; enhancing logistics data analytics and forecasting with more accurate and timely data; and reducing costs by migrating applications to modern hosting environments with shared services, all while applying Agile methodologies to reduce risk and complexity, enable technology insertion and synthesize logistics information. ***FY 2019 Plans:*** - Continue to initiate and accomplish efforts to collapse 359 systems and enhance logistics analytics by applying more accurate methodologies that will 1) improve command and control, 2) enhance logistics data analytics and forecasting, and 3) eliminate redundancy and duplication. Enhance logistics data analytics environment with machine learning, predictive, and prognostic capabilities; incorporate automated tools for rapid consolidation of duplicative analytics capabilities. ***FY 2020 Plans:*** - Will continue to initiate and accomplish efforts to collapse 359 systems and enhance logistics analytics by applying more accurate methodologies that will 1) improve command and control, 2) enhance logistics data analytics and forecasting, and 3)	0.000	1.200	1.200

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0708610F / *Logistics Information Technology (LOGIT)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
eliminate redundancy and duplication. Enhance logistics data analytics environment with machine learning, predictive, and prognostic capabilities; incorporate automated tools for rapid consolidation of duplicative analytics capabilities.			
Accomplishments/Planned Programs Subtotals	23.332	13.479	16.065

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPAF 03 Line Item 834430: *Global Combat Support System-Air Force (GCSS-AF)*	1.462	0.483	11.226	-	11.226	3.651	11.206	3.923	3.638	Continuing	Continuing

Remarks

E. Acquisition Strategy

Air Force Program Executive Office - Business Enterprise Systems (AFPEO-BES) is evaluating systems under the DoDI 5000.75 to approve authorities to proceed (ATP) for each core logistics system remediation/modification project.

The Logistics IT program utilizes the Agile software development methodology in the acquisition of these projects. The projects will use Firm Fixed Price contracts to the maximum extent possible as the program establishes new contracts or task orders. To improve the efficiency of the contracting process and reduce contract cycle time, the core logistics system program offices plan to use the existing NETCENTS-2 contract vehicle utilizing Best Value acquisition methodology where possible.

Agile development practices transform IT acquisitions by delivering capabilities faster and responding more effectively to changes in operations, technology, and budgets. The four objectives of Agile software development are: 1. Focusing on small, frequent capability releases; 2. Valuing working software over comprehensive documentation; 3. Responding rapidly to changes in operations, technology, and budgets; 4. Actively involving users throughout development to ensure high operational value.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0708610F / *Logistics Information Technology (LOGIT)*	**Project (Number/Name)** 675207 / *Logistics IT System Modernization*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ETIMS Enhancements - Prime Integration	C/CPAF	TBD : WPAFB, OH	0.000	-		-		0.518	Aug 2020	-		0.518	0.000	0.518	-
ETIMS SUP - Data Pilot	MIPR	AFRL : Rome, NY	0.000	0.868	Apr 2018	-		-		-		-	0.000	0.868	-
ETIMS SUP - Release v01.03	C/CPAF	DMI : WPAFB, OH	0.000	5.169	Dec 2017	0.500	Jun 2019	-		-		-	0.000	5.669	-
IMDS CDB MSAT SUP - Version 2.1	C/FFP	NETCENTS-2 : MAFB-Gunter, AL	0.000	1.436	Oct 2017	0.535	Oct 2018	-		-		-	0.000	1.971	-
SCS FIAR - CSRD Work Contract	C/CPAF	NETCENTS-2 : WPAFB, OH	0.000	1.719	Jun 2018	0.090	Oct 2018	-		-		-	0.000	1.809	-
IMLCI - Prime Integration	C/TBD	TBD : WPAFB, OH	0.000	-		5.935	Aug 2019	7.830	Apr 2020	-		7.830	0.000	13.765	-
IMLCI - Hosting	MIPR	TBD : WPAFB, OH	0.000	-		0.521	Aug 2019	1.778	Aug 2020	-		1.778	0.000	2.299	-
IMLCI - Data Pilot	MIPR	AFRL : Rome, NY	0.000	0.852	Apr 2018	-		-		-		-	0.000	0.852	-
IMDS CDB MSAT SUP - Data Pilot	MIPR	AFRL : Rome, NY	0.000	0.864	Apr 2018	-		-		-		-	0.000	0.864	-
IMDS CDB - Prime Contract	MIPR	CDO : Redstone Arsenal, AL	0.000	-		0.500	Apr 2019	0.500	Apr 2020	-		0.500	0.000	1.000	-
REMIS SUP - Data Pilot	MIPR	AFRL : Rome, NY	0.000	0.864	Apr 2018	-		-		-		-	0.000	0.864	-
PLM - Software Configuration 2	MIPR	AFRL : Rome, NY	0.000	2.306	Aug 2018	-		-		-		-	0.000	2.306	-
PLM - Data Pilot	MIPR	AFRL : Rome, NY	0.000	0.864	Apr 2018	-		-		-		-	0.000	0.864	-
		Subtotal	0.000	14.942		8.081		10.626		-		10.626	0.000	33.649	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ILS-S Enhancements - SME Support	C/FFP	TBD : MAFB-Gunter, AL	0.000	-		0.300	Sep 2019	0.300	Sep 2019	-		0.300	0.000	0.600	-
ETIMS Enhancements - ISP Support	C/FFP	TBD : WPAFB, OH	0.000	-		-		0.025	Aug 2020	-		0.025	0.000	0.025	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0708610F / *Logistics Information Technology (LOGIT)*	**Project (Number/Name)** 675207 / *Logistics IT System Modernization*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ETIMS Enhancements - SME Support	C/FFP	TBD : WPAFB, OH	0.000	-		-		0.037	Aug 2020	-		0.037	0.000	0.037	-
ETIMS SUP - SME Support	C/FFP	NETCENTS-2 : WPAFB, OH	0.000	0.442	Nov 2017	0.300	Mar 2019	-		-		-	0.000	0.742	-
ETIMS SUP - ISP Support	MIPR	ISP : MAFB-Gunter, AL	0.000	0.075	Jan 2018	-		-		-		-	0.000	0.075	-
IMDS CDB MSAT SUP - Hosting Environment Support	MIPR	DISA : MAFB-Gunter, AL	0.000	0.124	Oct 2017	0.045	Oct 2018	-		-		-	0.000	0.169	-
REMIS SUP - NGIS ODCs/Licenses	SS/CPFF	NGIS : WPAFB, OH	0.000	1.570	Jul 2018	-		-		-		-	0.000	1.570	-
REMIS SUP - SME Support	C/FFP	NETCENTS-2 : WPAFB, OH	0.000	0.884	Aug 2018	0.425	Jan 2019	-		-		-	0.000	1.309	-
REMIS SUP - DISA CDSP Support	MIPR	DISA : MAFB-Gunter, AL	0.000	-		0.075	Jan 2019	-		-		-	0.000	0.075	-
REMIS SUP - ISP Support	C/CPFF	Copper River : MAFB-Gunter, AL	0.000	0.325	Jul 2018	0.075	Jan 2019	-		-		-	0.000	0.400	-
SCS FIAR - ISP Support	C/FFP	Copper River : WPAFB, OH	0.000	0.053	Mar 2018	-		-		-		-	0.000	0.053	-
SCS FIAR - SME Support	C/FFP	NETCENTS-2 : WPAFB, OH	0.000	0.368	Jun 2018	-		-		-		-	0.000	0.368	-
SCS FIAR - Datacom Support	C/CPAF	NETCENTS-2 : WPAFB, OH	0.000	0.022	Mar 2018	-		-		-		-	0.000	0.022	-
IMLCI - SME Support	C/FFP	TACG : WPAFB, OH	0.000	0.286	Jun 2018	0.066	Jun 2019	0.273	Jun 2020	-		0.273	0.000	0.625	-
IMLCI - ISP Support	C/FFP	Bowhead : WPAFB, OH	0.000	0.381	Sep 2018	0.015	Sep 2019	0.191	Sep 2020	-		0.191	0.000	0.587	-
PLM - A&AS	C/FFP	Excellus/CACI : WPAFB, OH	0.000	1.100	Oct 2017	-		-		-		-	0.000	1.100	-
		Subtotal	0.000	5.630		1.301		0.826		-		0.826	0.000	7.757	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0708610F / *Logistics Information Technology (LOGIT)*	**Project (Number/Name)** 675207 / *Logistics IT System Modernization*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ETIMS Enhancements - CIE	C/FFP	TBD : WPAFB, OH	0.000	-		-		0.020	Aug 2020	-		0.020	0.000	0.020	-
IMDS CDB MSAT SUP - Test Support	MIPR	GSA : MAFB-Gunter, AL	0.000	0.100	Oct 2017	0.040	Oct 2018	-		-		-	0.000	0.140	-
REMIS SUP - Testing Support	C/Various	GSA : WPAFB, AL	0.000	0.057	Apr 2018	0.025	Jan 2019	-		-		-	0.000	0.082	-
IMLCI - LDTO	C/FFP	LDTO : WPAFB, AL	0.000	0.144	Aug 2019	0.012	Aug 2020	0.153	Aug 2021	-		0.153	0.000	0.309	-
		Subtotal	0.000	0.301		0.077		0.173		-		0.173	0.000	0.551	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ILS-S Enhancements - PASS	C/CPFF	BTAS : WPAFB, OH	0.000	-		0.300	Sep 2019	0.300	Sep 2020	-		0.300	0.000	0.600	-
ETIMS SUP - PMO Travel	Various	PMO : WPAFB, OH	0.000	0.050	Aug 2018	-		-		-		-	0.000	0.050	-
IMDS CDB MSAT SUP - Agile Coach	C/Various	BTAS/Oasis : MAFB-Gunter, AL	0.000	0.241	Oct 2017	0.055	Oct 2018	-		-		-	0.000	0.296	-
IMDS CDB MSAT SUP - Cost Support	C/FFP	BTAS : MAFB-Gunter, AL	0.000	-		0.025	Oct 2018	-		-		-	0.000	0.025	-
REMIS SUP - A&AS	C/Various	BTAS : WPAFB, OH	0.000	0.078	Feb 2018	0.025	Feb 2019	-		-		-	0.000	0.103	-
REMIS SUP - Architecture & IA support	C/FFP	Copper River : WPAFB, OH	0.000	0.506	May 2018	0.450	Jan 2019	-		-		-	0.000	0.956	-
REMIS SUP - ETASS	C/CPFF	OASIS : WPAFB, OH	0.000	0.080	Apr 2018	0.025	Feb 2019	-		-		-	0.000	0.105	-
REMIS Enhance - PASS	C/CPFF	BTAS : WPAFB, OH	0.000	-		0.600	Sep 2019	0.600	Sep 2020	-		0.600	0.000	1.200	-
SCS FIAR - ETASS	C/CPFF	OASIS : WPAFB, OH	0.000	0.070	Apr 2018	-		-		-		-	0.000	0.070	-
SCS FIAR - PASS	C/CPFF	BTAS : WPAFB, OH	0.000	0.040	Feb 2018	-		-		-		-	0.000	0.040	-
SCS FIAR - Wealth Managment	C/FFP	Wealth Management : WPAFB, OH	0.000	0.060	Sep 2018	-		-		-		-	0.000	0.060	-
IMLCI - ETASS	C/CPFF	OASIS : WPAFB, OH	0.000	0.696	Mar 2018	0.369	Mar 2019	0.460		-		0.460	0.000	1.525	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0708610F / *Logistics Information Technology (LOGIT)*	**Project (Number/Name)** 675207 / *Logistics IT System Modernization*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
IMLCI - PASS	C/CPFF	BTAS : WPAFB, OH	0.000	0.453	Mar 2018	0.436	Mar 2019	0.699	Mar 2020	-		0.699	0.000	1.588	-
IMLCI - Cost Support	C/FFP	Tekoloti : WPAFB, OH	0.000	0.165	Aug 2018	0.065	May 2019	0.210	May 2020	-		0.210	0.000	0.440	-
IMLCI - PMO Travel	Various	PMO : WPAFB, OH	0.000	0.020	Oct 2017	0.020	Oct 2018	0.021	Oct 2019	-		0.021	0.000	0.061	-
SCI - ETASS	C/CPFF	OASIS : WPAFB, OH	0.000	-		-		0.250	Mar 2020	-		0.250	0.000	0.250	-
SCI - PASS	C/CPFF	BTAS : WPAFB, OH	0.000	-		-		0.250	Mar 2020	-		0.250	0.000	0.250	-
Emerging FIAR - PASS	C/CPFF	BTAS : WPAFB, OH	0.000	-		0.450	Jan 2019	0.450	Jan 2020	-		0.450	0.000	0.900	-
Strike Teams - PASS	C/CPFF	BTAS : WPAFB, OH	0.000	-		1.200	Oct 2019	1.200	Oct 2020	-		1.200	0.000	2.400	-
		Subtotal	0.000	2.459		4.020		4.440		-		4.440	0.000	10.919	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	23.332		13.479		16.065		-		16.065	0.000	52.876	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0708610F / *Logistics Information Technology (LOGIT)*	**Project (Number/Name)** 675207 / *Logistics IT System Modernization*

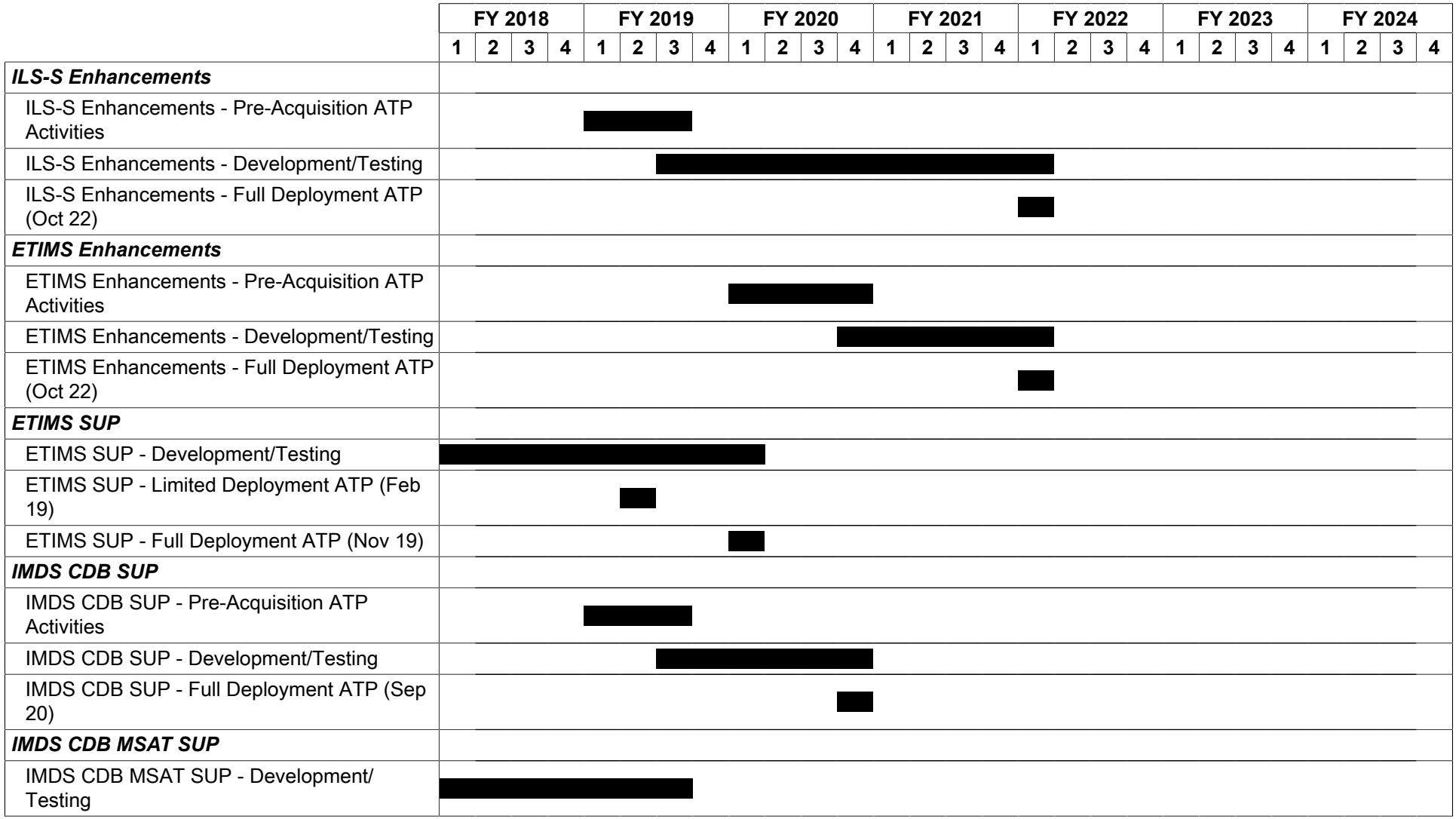

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0708610F / *Logistics Information Technology (LOGIT)*	**Project (Number/Name)** 675207 / *Logistics IT System Modernization*

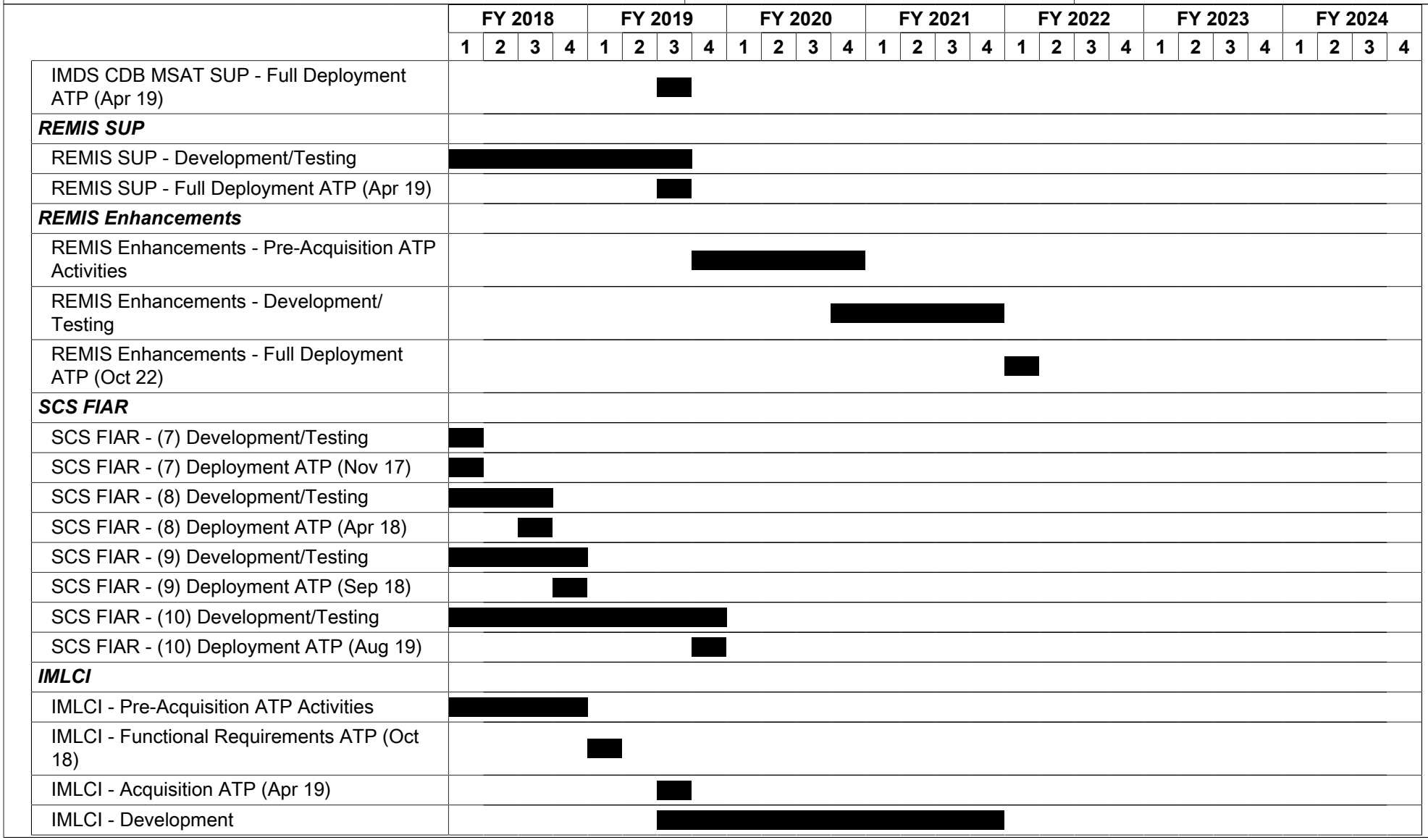

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0708610F / *Logistics Information Technology (LOGIT)*	**Project (Number/Name)** 675207 / *Logistics IT System Modernization*

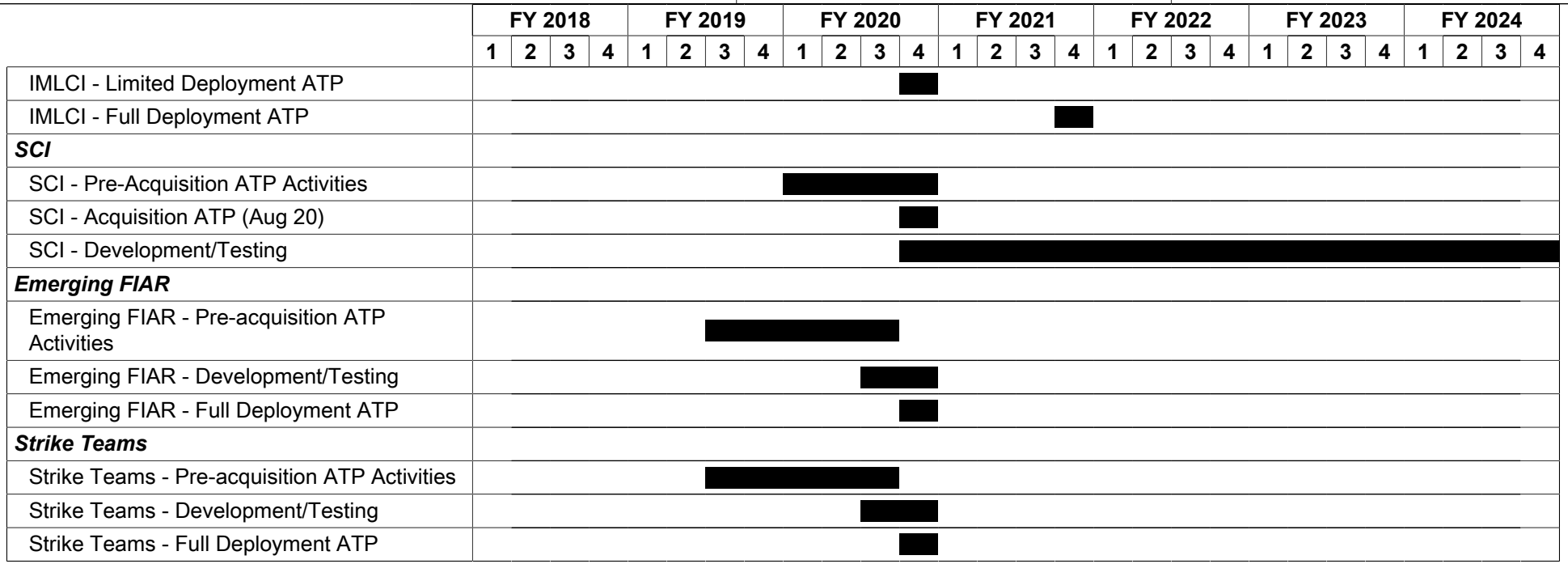

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0708610F / *Logistics Information Technology (LOGIT)*	**Project (Number/Name)** 675207 / *Logistics IT System Modernization*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ILS-S Enhancements				
ILS-S Enhancements - Pre-Acquisition ATP Activities	1	2019	3	2019
ILS-S Enhancements - Development/Testing	3	2019	1	2022
ILS-S Enhancements - Full Deployment ATP (Oct 22)	1	2022	1	2022
ETIMS Enhancements				
ETIMS Enhancements - Pre-Acquisition ATP Activities	1	2020	4	2020
ETIMS Enhancements - Development/Testing	4	2020	1	2022
ETIMS Enhancements - Full Deployment ATP (Oct 22)	1	2022	1	2022
ETIMS SUP				
ETIMS SUP - Development/Testing	1	2018	1	2020
ETIMS SUP - Limited Deployment ATP (Feb 19)	2	2019	2	2019
ETIMS SUP - Full Deployment ATP (Nov 19)	1	2020	1	2020
IMDS CDB SUP				
IMDS CDB SUP - Pre-Acquisition ATP Activities	1	2019	3	2019
IMDS CDB SUP - Development/Testing	3	2019	4	2020
IMDS CDB SUP - Full Deployment ATP (Sep 20)	4	2020	4	2020
IMDS CDB MSAT SUP				
IMDS CDB MSAT SUP - Development/Testing	1	2018	3	2019
IMDS CDB MSAT SUP - Full Deployment ATP (Apr 19)	3	2019	3	2019
REMIS SUP				
REMIS SUP - Development/Testing	1	2018	3	2019
REMIS SUP - Full Deployment ATP (Apr 19)	3	2019	3	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0708610F / *Logistics Information Technology (LOGIT)*	**Project (Number/Name)** 675207 / *Logistics IT System Modernization*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
REMIS Enhancements				
REMIS Enhancements - Pre-Acquisition ATP Activities	4	2019	4	2020
REMIS Enhancements - Development/Testing	4	2020	4	2021
REMIS Enhancements - Full Deployment ATP (Oct 22)	1	2022	1	2022
SCS FIAR				
SCS FIAR - (7) Development/Testing	1	2018	1	2018
SCS FIAR - (7) Deployment ATP (Nov 17)	1	2018	1	2018
SCS FIAR - (8) Development/Testing	1	2018	3	2018
SCS FIAR - (8) Deployment ATP (Apr 18)	3	2018	3	2018
SCS FIAR - (9) Development/Testing	1	2018	4	2018
SCS FIAR - (9) Deployment ATP (Sep 18)	4	2018	4	2018
SCS FIAR - (10) Development/Testing	1	2018	4	2019
SCS FIAR - (10) Deployment ATP (Aug 19)	4	2019	4	2019
IMLCI				
IMLCI - Pre-Acquisition ATP Activities	1	2018	4	2018
IMLCI - Functional Requirements ATP (Oct 18)	1	2019	1	2019
IMLCI - Acquisition ATP (Apr 19)	3	2019	3	2019
IMLCI - Development	3	2019	4	2021
IMLCI - Limited Deployment ATP	4	2020	4	2020
IMLCI - Full Deployment ATP	4	2021	4	2021
SCI				
SCI - Pre-Acquisition ATP Activities	1	2020	4	2020
SCI - Acquisition ATP (Aug 20)	4	2020	4	2020
SCI - Development/Testing	4	2020	4	2024
Emerging FIAR				

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0708610F / *Logistics Information Technology (LOGIT)*	**Project (Number/Name)** 675207 / *Logistics IT System Modernization*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Emerging FIAR - Pre-acquisition ATP Activities	3	2019	3	2020
Emerging FIAR - Development/Testing	3	2020	4	2020
Emerging FIAR - Full Deployment ATP	4	2020	4	2020
Strike Teams				
Strike Teams - Pre-acquisition ATP Activities	3	2019	3	2020
Strike Teams - Development/Testing	3	2020	4	2020
Strike Teams - Full Deployment ATP	4	2020	4	2020

Note

- REMIS Enhancements, ILS-S Enhancements, Logistics Strike Teams, and Emerging FIAR Requirements will be continuing to conduct pre-acquisition ATP activities. These activities include items such as risk reduction efforts, problem statements, and Clinger-Cohen Act documentation.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0708611F / *Support Systems Development*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	11.362	4.497	0.539	0.000	0.539	11.860	13.746	12.707	10.448	Continuing	Continuing
675042: *Log Application Logisitics Integration (LALI)*	-	11.362	4.497	0.539	0.000	0.539	9.875	13.746	12.707	10.448	Continuing	Continuing
675044: *Logistics Systems Development (LSD)**	-	0.000	0.000	0.000	0.000	0.000	1.985	0.000	0.000	0.000	0.000	1.985

*This project's R-2a exhibit has been suppressed due to funding not beginning until after FY 2020

A. Mission Description and Budget Item Justification

Logistics, Installations and Mission Support - Enterprise View (LIMS-EV) capability provides a Business Intelligence (BI) and Decision Support (DS) solution for the A4 community. USAF decision-makers, maintainers and planners require increased access to comprehensive data related to platform mission, operational status, support equipment availability and parts. This data is required to be accessible in a number different configurations ranging from preformatted executive dashboards to highly customizable ad-hoc reporting to enable improved decision making based on accurate, near-real-time data available in a simple self-service environment that provides detailed supply chain data from lowest levels all the way up to operational planners and senior leadership. By aggregating and exposing data from over 130 data sources, LIMS-EV provides warfighters with timely, authoritative information to make informed decisions.

The LIMS-EV capability is migrating, along with the rest of AF Data Services, from GCSS-AF heritage to a commercial government cloud-configured environment. That move will result in improved performance, greater scalability and reliability, enhanced ability to leverage Software as a Service (SAAS), and reduced operational costs from utilization of common infrastructure. This move will also result in implementation of new system engineering processes based on agile software development/rapid prototyping via the CCE 2.0 dev/test/production environments and Data Services development laboratories and will leverage cloud best practices including streamlined promotion and deployment processes, automating previously manual code reviews, security testing, and deployment.

LIMS-EV funding supports the ability to more effectively work in the cloud environment and to exploit emerging technology to enhance existing capabilities, extend access to mobile users, expand the amount of data accessible, and incorporate more predictive capabilities into the current reporting capability. This will extend existing BI capabilities to provide configurable alerting, predictive/what-if analysis, mobile applications and better integrate functionality based on priority requirements as defined/ approved by the A4 governance bodies.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver our integrated logistics capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

The FY 2019 funding request was reduced by $5.034 million to account for the availability of prior year execution balances.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0708611F / *Support Systems Development*

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	9.362	4.497	12.648	0.000	12.648
Current President's Budget	11.362	4.497	0.539	0.000	0.539
Total Adjustments	2.000	0.000	-12.109	0.000	-12.109
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	2.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	-12.109	0.000	-12.109

Change Summary Explanation

FY18 MRK-Investment Mark for Vehicle View lower-carbon solutions effort $2.000M

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0708611F / *Support Systems Development*	Project (Number/Name) 675042 / *Log Application Logisitics Integration (LALI)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675042: *Log Application Logisitics Integration (LALI)*	-	11.362	4.497	0.539	0.000	0.539	9.875	13.746	12.707	10.448	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Logistics, Installations and Mission Support - Enterprise View (LIMS-EV) capability provides a Business Intelligence (BI) and Decision Support (DS) solution for the A4 community. USAF decision-makers, maintainers and planners require increased access to comprehensive data related to platform mission, operational status, support equipment availability and parts. This data is required to be accessible in a number different configurations ranging from preformatted executive dashboards to highly customizable ad-hoc reporting to enable improved decision making based on accurate, near-real-time data available in a simple self-service environment that provides detailed supply chain data from lowest levels all the way up to operational planners and senior leadership. By aggregating and exposing data from over 130 data sources, LIMS-EV provides warfighters with timely, authoritative information to make informed decisions.

The LIMS-EV capability is migrating, along with the rest of AF Data Services, from GCSS-AF heritage to a commercial government cloud-configured environment. That move will result in improved performance, greater scalability and reliability, enhanced ability to leverage Software as a Service (SAAS), and reduced operational costs from utilization of common infrastructure. This move will also result in implementation of new system engineering processes based on agile software development/rapid prototyping via the CCE 2.0 dev/test/production environments and Data Services development laboratories and will leverage cloud best practices including streamlined promotion and deployment processes, automating previously manual code reviews, security testing, and deployment.

LIMS-EV funding supports the ability to more effectively work in the cloud environment and to exploit emerging technology to enhance existing capabilities, extend access to mobile users, expand the amount of data accessible, and incorporate more predictive capabilities into the current reporting capability. This will extend existing BI capabilities to provide configurable alerting, predictive/what-if analysis, mobile applications and better integrate functionality based on priority requirements as defined/ approved by the A4 governance bodies.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver our integrated logistics capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: LIMS-EV Version 2.0	11.362	0.000	0.000
Description: Minor change requests for the Vehicle Management, Supply, Maintenance, Avionics, Propulsion, Repair Network, Support Equipment and Communication Security (COMSEC) communities while refactoring LIMS-EV to native cloud services.			
FY 2019 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0708611F / *Support Systems Development*	**Project (Number/Name)** 675042 / *Log Application Logisitics Integration (LALI)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
N/A ***FY 2020 Plans:*** N/A			
Title: LIMS-EV Version 3.0 Business Capability Acquisition Cycle (BCAC) Phase 3 ***Description:*** Expanded, Scalable, Portable, Enterprise Logistics Data Accessibility ***FY 2019 Plans:*** Four Major Enhancements and 11 Minor change requests for the Vehicle Management, Supply, Maintenance, Avionics, Propulsion, Repair Network, Support Equipment and Communication Security (COMSEC) communities to build the foundation and support targeted initial offerings of the following capabilities: - Enable secure, elastic capability that automatically scales to on-demand peak needs, provides reliable response and reduces scale and time of outages - Provide tiers of data storage efficiently tailoring data accessibility based on needs and costs - Provide greater control to functional representatives to transform data by revising reference tables and business rules without developer intervention - Provide greater functional self service provisioning capability - Implement Mobile Capability to support initiatives (i.e. Flight line of the Future) - Enabling federation of data across multi-security and functional domains. - Expand ADHOC reporting capability without needing special data universes - Modernize expanded visualization capability, with greater consistency across application views. - Expand access to new data feeds as well as unstructured and semi-structured data - Provide foundation infrastructure for Logistics Data Environment Improved Forecasting Capability - Forecasting future health of weapon system and equipment with constraint analysis - Improve trend analysis - Implementation of Statistical Process Control with anomaly detection - Root cause and fault analysis - Future data projections with high degree of confidence ***FY 2020 Plans:*** Eight Major Enhancements and 23 Minor change requests for the Vehicle Management, Supply, Maintenance, Avionics, Propulsion, Repair Network, Support Equipment and Communication Security (COMSEC) communities that build on prior development to enable advanced Predictive Enterprise Logistics Reporting and Analytics in the following areas:	-	4.497	0.539

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0708611F / *Support Systems Development*	**Project (Number/Name)** 675042 / *Log Application Logisitics Integration (LALI)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Implement a modeling & simulation Capability - Big Data analytics - Actuarial capability and reliability analysis - Incorporation of operational data such as flight profile data to support deep performance analysis of weapon system components and supporting predictive modeling - Ability to configure and simulate different logistics outcomes based on known factors ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding decreased from FY19 to FY20 due to late obligations and expenditures in FY18.			
Accomplishments/Planned Programs Subtotals	11.362	4.497	0.539

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

LIMS-EV will utilize services provided by the Air Force Common Computing Environment (CCE) Government Cloud Framework, migrating from the End-of-Life GCSS-AF Integration Framework. AFLCMC/HNII Data Services Program Management Office (PMO), as LIMS-EV Program Manager, is responsible to competitively acquire additional LIMS-EV capabilities using a variety of fixed price, labor hour, time and material, and cost plus contracts through the environment migration and within the CCE Framework.

LIMS-EV capabilities utilize services provided by the GCSS-AF Integration/CCE Framework. AFLCMC/HNII Data Services PMO, as LIMS-EV Program Manager, manages LIMS-EV development projects following the Agile/Rapid Prototyping software development release process.

LIMS-EV development projects will be implemented via the CCE development contract under oversight by AFLCMC/HNII Data Services Program Management Office, Wright-Patterson Air Force Base, Ohio.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0708611F / *Support Systems Development*	Project (Number/Name) 675042 / *Log Application Logisitics Integration (LALI)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
LALI LIMS-EV Systems Engineering Contractor Support (Product Development) LIMS-EV Version 2.0	C/CPFF	Leidos : Dayton, OH	-	11.362		-		-		-		-	Continuing	Continuing	-
LALI LIMS-EV Systems Engineering Contractor Support (Product Development) LIMS-EV Version 3.0 - Business Capability Acquisition Cycle	C/CPAF	Leidos : Dayton, OH	-	-		4.497		0.539		-		0.539	Continuing	Continuing	-
		Subtotal	-	11.362		4.497		0.539		-		0.539	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	11.362		4.497		0.539		-		0.539	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0708611F / *Support Systems Development*	**Project (Number/Name)** 675042 / *Log Application Logisitics Integration (LALI)*

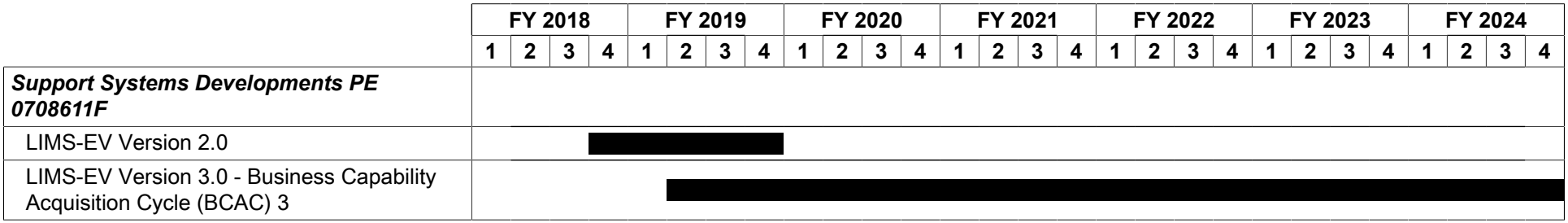

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0708611F / *Support Systems Development*	**Project (Number/Name)** 675042 / *Log Application Logisitics Integration (LALI)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Support Systems Developments PE 0708611F				
LIMS-EV Version 2.0	4	2018	4	2019
LIMS-EV Version 3.0 - Business Capability Acquisition Cycle (BCAC) 3	2	2019	4	2024

Note

LIMS-EV Version 3.0 - Business Capability Acquisition Cycle (BCAC) 3 period of performance end date is 2Q 2025. IDECS limits schedule to 4Q 2024.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0804743F / *Other Flight Training*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	1.998	2.022	2.057	0.000	2.057	2.093	2.137	2.177	2.216	Continuing	Continuing
675304: *Aviation Resource Management System (ARMS)*	-	1.998	2.022	2.057	0.000	2.057	2.093	2.137	2.177	2.216	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Aviation Resource Management System (ARMS) is the authoritative data source for recording and managing aircrew training information, aircrew/parachutist management, flying hour tracking, flight pay management, and flying gate tracking for 57,000 Air Force members. The Air Force uses this information to enhance safety of-flight operations and to determine eligibility to perform aviation related events. ARMS interfaces with the Military Personnel Data System (MilPDS) and multiple operations and flight scheduling systems such as Patriot Excalibur (PEX), Graduate Training Integration Management System (GTIMS), Center Operations On-Line (COOL), Global Decision Support System (GDSS), and Automated Aircrew Management System (AAMS) and is used to determine whom to select for flying operations, assignment actions, and promotion of aircrew members.

New development work is required to provide additional flying operations information which will aid in better portraying Air Force readiness and to feed this data into Defense Readiness Reporting System Strategic (DRRS-S). These enhanced capabilities, to be developed incrementally, include the following: electronic flight record, flying hour management/execution, simulator and RPA management/utilization, full career logbook, training look-back, aircrew member man-month allocation, enhanced resource and jump module management, and additional interfaces.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver ARMS capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

Funds will be used to perform studies and innovative integration efforts for common technology capabilities such as cloud migration, technology development and mobile application.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0804743F / *Other Flight Training*	

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	2.074	2.022	2.057	0.000	2.057
Current President's Budget	1.998	2.022	2.057	0.000	2.057
Total Adjustments	-0.076	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	-0.076	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Aviation Resource Management System (ARMS)	1.998	2.022	2.057	0.000	2.057
Description: Hardware/software development to update ARMS, adding functionality and system interfaces. ***FY 2019 Plans:*** - Finalize Development Activities/Testing for Inc I, Build 2A (Training Data Module) - Continue Development Activities for Inc I Build 2B (Simulator Utilization Module) ***FY 2020 Base Plans:*** - Continue Development Activities for ARMS Missile Management module build. ***FY 2020 OCO Plans:*** N/A. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** - ARMS PMO is building a different system module from previous year, with different functional/financial requirements.					
Accomplishments/Planned Programs Subtotals	1.998	2.022	2.057	0.000	2.057

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0804743F / *Other Flight Training*

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• RDTE 07 0804743F: *Other Flight Training*	1.998	2.240	2.281	-	2.281	2.324	2.371	2.413	2.456	Continuing	Continuing

Remarks

E. Acquisition Strategy

ARMS will incrementally develop enhancements to the existing system. The acquisition will be accomplished organically or with Firm Fixed Price (FFP) contracts awarded under Section 8(a) as small business set aside.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0804743F / *Other Flight Training*	**Project (Number/Name)** 675304 / *Aviation Resource Management System (ARMS)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ARMS Increment 1, Build 1 and Build 2 contract	SS/FFP	581ST SMXS ROBINS AFB : Warner Robins, GA	-	-		-		-		-		-	Continuing	Continuing	3.400
ARMS BUILD I	SS/FFP	581ST SNXS ROBINS AFB : Warner Robins, GA	-	-		-		-		-		-	Continuing	Continuing	-
ARMS BUILD II	SS/FFP	581ST SMXS ROBINS AFB : Warner Robins, GA	-	-		-		-		-		-	Continuing	Continuing	-
ARMS Increment 2 Development	SS/FFP	581ST SMXS ROBINS AFB : Warner Robins, GA	-	0.711	Mar 2019	0.810	Mar 2020	0.810	Mar 2020	-		0.810	Continuing	Continuing	10.000
		Subtotal	-	0.711		0.810		0.810		-		0.810	Continuing	Continuing	N/A

Remarks

ARMS INCREMENT I INCLUDES BUILDS I AND II. ARMS BUILD I AND II ARE NOW LISTED SEPARATELY.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ARMS Architecture Contract Support	C/FFP	Copper River Information Technology, LLC : Anchorage, AK	-	0.065	Sep 2018	0.065	Sep 2019	0.067	Sep 2020	-		0.067	Continuing	Continuing	-
ARMS TECHNICAL & RISK SME	C/FFP	DDC IT SERVICES : Albuquerque, NM	-	-		-		-		-		-	Continuing	Continuing	-
ARMS C&A SUPPORT III	C/FFP	OASIS : Lexington, MA	-	0.154	Apr 2018	0.154	Apr 2019	0.159	Apr 2020	-		0.159	Continuing	Continuing	-
ARMS CONFIGURATION MANAGER	C/FFP	OASIS : Lexington, MA	-	0.126	Apr 2018	0.126	Apr 2019	0.130	Apr 2020	-		0.130	Continuing	Continuing	-
ARMS AGILE TOOLS	C/TBD	TBD : TBD	-	0.051	Apr 2018	-		-		-		-	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0804743F / *Other Flight Training*	**Project (Number/Name)** 675304 / *Aviation Resource Management System (ARMS)*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ARMS SYSTEM ADMIN III	C/FFP	OASIS : Lexington, MA	-	0.156	Apr 2018	0.156	Apr 2019	0.161	Apr 2020	-		0.161	Continuing	Continuing	-
ARMS CIE SUPPORT	C/FFP	TBD : TBD	-	0.207	Mar 2019	0.220	Mar 2020	0.227	Apr 2020	-		0.227	Continuing	Continuing	-
ARMS CIE SUPPORT ADDENDUM	C/FFP	GSA : Atlanta, GA	-	-		-		-		-		-	Continuing	Continuing	-
ARMS INTEGRATION SUPPORT	C/FFP	Not specified. : TBD	-	0.195	Apr 2019	0.158	Apr 2020	0.163	Apr 2020	-		0.163	Continuing	Continuing	-
ARMS PLURALSIGHT	C/TBD	TBD : TBD	-	-		-		-		-		-	Continuing	Continuing	-
ARMS Financial Improvement Audit Readiness Support	SS/FFP	TM Capture : Maxwell AFB-Gunter Annex, AL	-	0.065	Feb 2019	0.065	Feb 2020	0.065	Feb 2020	-		0.065	Continuing	Continuing	0.325
		Subtotal	-	1.019		0.944		0.972		-		0.972	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ARMS Test Support	C/FFP	GSA : Maxwell AFB-Gunter Annex, AL	-	0.054	Apr 2019	0.054	Apr 2020	0.056	Apr 2020	-		0.056	Continuing	Continuing	0.260
ARMS TEST MANAGER	C/CPAF	OASIS : Lexington, MA	-	0.154	Mar 2018	0.154	Mar 2019	0.159	Apr 2020	-		0.159	Continuing	Continuing	-
		Subtotal	-	0.208		0.208		0.215		-		0.215	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ARMS PMA Other Govt Costs	C/TBD	TBD : TBD	-	0.060	Apr 2018	0.060	Apr 2019	0.060	Apr 2020	-		0.060	Continuing	Continuing	-
		Subtotal	-	0.060		0.060		0.060		-		0.060	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0804743F / *Other Flight Training*	Project (Number/Name) 675304 / *Aviation Resource Management System (ARMS)*	

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	1.998		2.022		2.057		-		2.057	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0804743F / *Other Flight Training*	**Project (Number/Name)** 675304 / *Aviation Resource Management System (ARMS)*

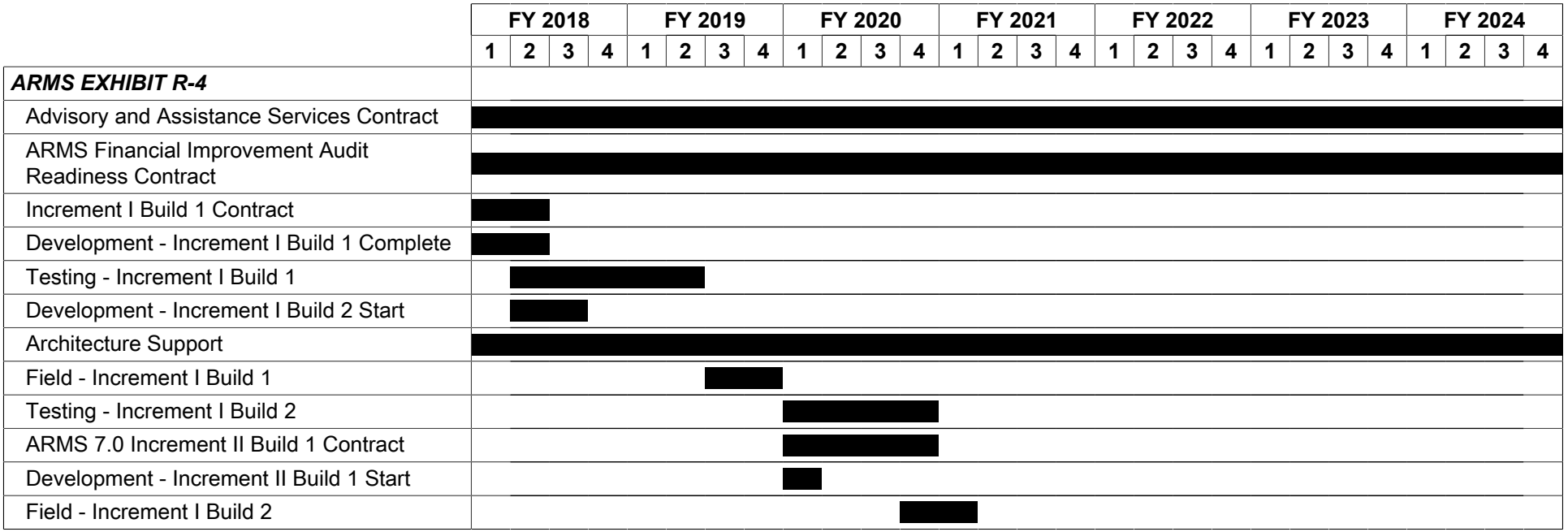

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0804743F / *Other Flight Training*	**Project (Number/Name)** 675304 / *Aviation Resource Management System (ARMS)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ARMS EXHIBIT R-4				
Advisory and Assistance Services Contract	1	2018	4	2024
ARMS Financial Improvement Audit Readiness Contract	1	2018	4	2024
Increment I Build 1 Contract	1	2018	2	2018
Development - Increment I Build 1 Complete	1	2018	2	2018
Testing - Increment I Build 1	2	2018	2	2019
Development - Increment I Build 2 Start	2	2018	3	2018
Architecture Support	1	2018	4	2024
Field - Increment I Build 1	3	2019	4	2019
Testing - Increment I Build 2	1	2020	4	2020
ARMS 7.0 Increment II Build 1 Contract	1	2020	4	2020
Development - Increment II Build 1 Start	1	2020	1	2020
Field - Increment I Build 2	4	2020	1	2021

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0808716F / *Other Personnel Activities*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	0.103	0.108	0.010	0.000	0.010	0.012	0.014	0.016	0.018	Continuing	Continuing
675141: *DEOMI Faculty Research*	-	0.103	0.108	0.010	0.000	0.010	0.012	0.014	0.016	0.018	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Defense Equal Opportunity Management Institute (DEOMI) provides grants to the civilian academic community to conduct research on military and civilian equal opportunity issues using standard social science methodology and engineering analysis. The research methodology and analysis includes developing a literature review proposing hypotheses and methods of research. The grantee will then gather appropriate data, draw conclusions and present discussions, recommendations and reports based on their funding.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	0.107	0.108	0.110	0.000	0.110
Current President's Budget	0.103	0.108	0.010	0.000	0.010
Total Adjustments	-0.004	0.000	-0.100	0.000	-0.100
• 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	-0.004	0.000	-0.100	0.000	-0.100

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0808716F / *Other Personnel Activities*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Equal Opportunity Issues	0.103	0.108	0.010
Description: Conduct research on military and civilian equal opportunity issues. ***FY 2019 Plans:*** Continue conducting research on military and civilian equal opportunity issues. ***FY 2020 Plans:*** Continue conducting research on military and civilian equal opportunity issues. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding decreased due to other higher priority Air Force requirements.			
Accomplishments/Planned Programs Subtotals	0.103	0.108	0.010

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

Grants will be awarded competitively.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0808716F / *Other Personnel Activities*	Project (Number/Name) 675141 / *DEOMI Faculty Research*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DEOMI	Various	Various : Various	-	0.103	Mar 2018	0.108	Mar 2018	0.010	Mar 2020	-		0.010	Continuing	Continuing	-
		Subtotal	-	0.103		0.108		0.010		-		0.010	Continuing	Continuing	N/A

Remarks

Contract method will be a grant

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.103		0.108		0.010		-		0.010	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0808716F / *Other Personnel Activities*	**Project (Number/Name)** 675141 / *DEOMI Faculty Research*

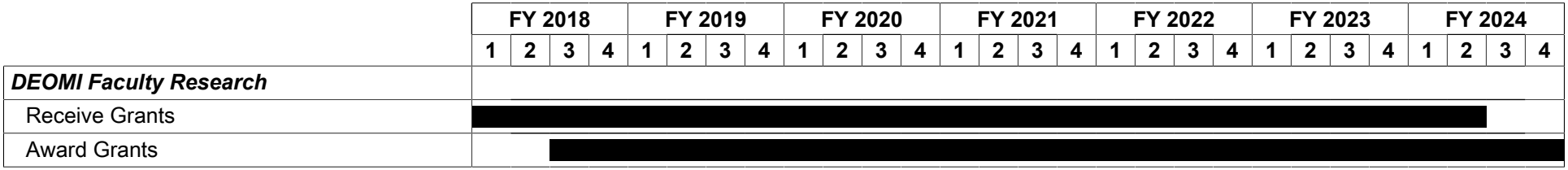

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0808716F / *Other Personnel Activities*	**Project (Number/Name)** 675141 / *DEOMI Faculty Research*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
DEOMI Faculty Research				
Receive Grants	1	2018	2	2024
Award Grants	3	2018	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0901202F / *Joint Personnel Recovery Agency*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	1.933	2.023	2.060	0.000	2.060	2.096	2.139	2.178	2.217	Continuing	Continuing
675196: *Joint Technology Exploitation*	-	1.933	2.023	2.060	0.000	2.060	2.096	2.139	2.178	2.217	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The FY17 funding request was reduced by $.269M to account for the availability of prior year execution balances.

Funding supports Personnel Recovery development efforts to upgrade Isolated Personnel reporting devices & locating systems in support of Combatant Commanders and Services. Joint Personnel Recovery Agency (JPRA) developmental efforts address Personnel Recovery capability shortfalls & gaps identified in the Personnel Recovery Initial Capabilities Document approved by Joint Requirements Oversight Council Memorandum 120-12 on 8 Aug 2012. Activties include funding for research and development, support equipment, contract services and all associated costs specifically identified to support the JPRA headquarters at Ft. Belvoir, VA and other JPRA operating locations.

In FY16, the Common Distress Reporting System (CDRS) began development. CDRS will integrate all personnel locating devices into the existing reporting device architecture & Combat Survivor Evader Locater base stations to provide one common operating picture for timely and efficient recovery operations of isolated personnel.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force					Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*		**R-1 Program Element (Number/Name)** PE 0901202F / *Joint Personnel Recovery Agency*			
B. Program Change Summary ($ in Millions)	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**
Previous President's Budget	2.006	2.023	2.060	0.000	2.060
Current President's Budget	1.933	2.023	2.060	0.000	2.060
Total Adjustments	-0.073	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	-0.073	0.000	0.000	0.000	0.000

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Common Distress Reporting System	1.003	1.004	1.010
Description: Develop/implement the Common Distress Reporting System ***FY 2019 Plans:*** - Continue the Common Distress Reporting System (CDRS)development. CDRS will integrate all personnel locating devices into the existing reporting device architecture & Combat Survivor Evader Locater base stations to provide one common operating picture for timely and efficient recovery operations of isolated personnel. ***FY 2020 Plans:*** - Continue the Common Distress Reporting System (CDRS)development. CDRS will integrate all personnel locating devices into the existing reporting device architecture & Combat Survivor Evader Locater base stations to provide one common operating picture for timely and efficient recovery operations of isolated personnel. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding increase to cover increased costs.			
Title: Collaborative Personnel Recovery planning systems & PR Capabilities Development	0.930	1.019	1.050
Description: - Assess and evaluate technologies for personnel recovery real-time collaborative planning capabilities to include cyber support to personnel recovery, standardization and interoperability of joint personnel recovery mission management and planning systems, and standardization of human and machine-to-machine information exchanges, communications, and data transfer to facilitate mission planning for personnel recovery			

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0901202F / *Joint Personnel Recovery Agency*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY 2019 Plans: - Continue to assess and evaluate technologies for personnel recovery real-time collaborative planning capabilities to include cyber support to personnel recovery, standardization and interoperability of joint personnel recovery mission management and planning systems, and standardization of human and machine-to-machine information exchanges, communications, and data transfer to facilitate mission planning for personnel recovery ***FY 2020 Plans:*** - Continue to assess and evaluate technologies for personnel recovery real-time collaborative planning capabilities to include cyber support to personnel recovery, standardization and interoperability of joint personnel recovery mission management and planning systems, and standardization of human and machine-to-machine information exchanges, communications, and data transfer to facilitate mission planning for personnel recovery ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding increased to cover increased costs.			
Accomplishments/Planned Programs Subtotals	1.933	2.023	2.060

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

Projects will leverage existing program contracts. In the rare instance where a contract does not already exist, contracts will be awarded through full and open competition.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901202F / *Joint Personnel Recovery Agency*	**Project (Number/Name)** 675196 / *Joint Technology Exploitation*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Common Distress Reporting System	SS/TBD	AFLCMC/HBZ : Huntington Beach, CA	-	1.003	Mar 2018	1.004	Mar 2018	1.010	Mar 2020	-		1.010	Continuing	Continuing	-
Optimal Search Study	Various	Various : NV	-	-		-		-		-		-	Continuing	Continuing	-
Collaborative Personnel Recovery Planning Systems & PR Capabilities Development	Various	Various : NV	-	0.930	Mar 2018	1.019	Mar 2018	1.050	Mar 2020	-		1.050	Continuing	Continuing	-
Personnel Recovery Modeling and simulation development	Various	Various : NV	-	-		-		-		-		-	Continuing	Continuing	-
		Subtotal	-	1.933		2.023		2.060		-		2.060	Continuing	Continuing	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	1.933		2.023		2.060		-		2.060	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901202F / *Joint Personnel Recovery Agency*	**Project (Number/Name)** 675196 / *Joint Technology Exploitation*

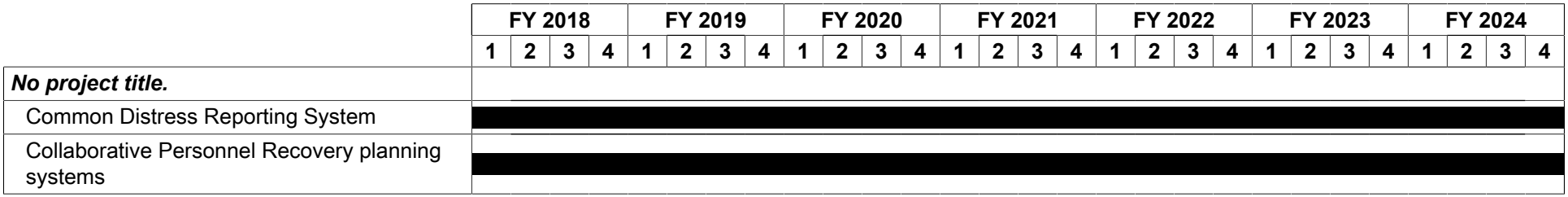

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901202F / *Joint Personnel Recovery Agency*	**Project (Number/Name)** 675196 / *Joint Technology Exploitation*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
No project title.				
Common Distress Reporting System	1	2018	4	2024
Collaborative Personnel Recovery planning systems	1	2018	4	2024

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0901218F / *Civilian Compensation Program*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	2.905	3.561	3.809	0.000	3.809	3.876	3.956	4.028	4.100	Continuing	Continuing
674139: *Civilian Compensation Program*	-	2.905	3.561	3.809	0.000	3.809	3.876	3.956	4.028	4.100	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program element provides for payment of civilian compensation benefits for disability due to personal injury sustained while in the performance of duty or due to employment-related disease according to the Federal Employees Compensation Act (FECA) under Title 5 U.S.C., Chapter 81. The Department of Labor (DOL) administers this program and charges the Department of the Air Force for its employee costs; therefore, this is a MUST PAY bill for Air Force. The Program Element(PE) excludes manpower authorizations and costs. This PE is in Budget Activity 7 in support of payment of civilian compensation benefits for disability due to personal injury sustained while in the performance of duty or due to employment-related disease according to FECA under Title 5 U.S.C., Chapter 81.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	3.780	3.772	3.809	0.000	3.809
Current President's Budget	2.905	3.561	3.809	0.000	3.809
Total Adjustments	-0.875	-0.211	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	-0.726	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	-0.149	-0.211	0.000	0.000	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0901218F / *Civilian Compensation Program*

Change Summary Explanation

FY2018 funding reduced by $0.149M for the Federally Funded Research Development Center (FFRDC).
FY2019 funding reduced by $0.211M for the Federally Funded Research Development Center (FFRDC).

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Civilian Compensation	2.905	3.561	3.809
Description: Program compensates employees assigned to RDT&E facilities for work-related injuries or occupational diseases. ***FY 2019 Plans:*** Continue to provide compensation to employees assigned to RDT&E facilities for work-related injuries or occupational diseases, and implement services to expedite the return of employees back to work. ***FY 2020 Plans:*** Continue to provide compensation to employees assigned to RDT&E facilities for work-related injuries or occupational diseases, and implement services to expedite the return of employees back to work. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding increased to pay for increased costs.			
Accomplishments/Planned Programs Subtotals	2.905	3.561	3.809

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

Not Applicable.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901218F / *Civilian Compensation Program*	**Project (Number/Name)** 674139 / *Civilian Compensation Program*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Continue development of compensation plan	RO	AF/A1 : Pentagon, DC	-	2.905	Apr 2018	3.561	Apr 2019	3.809	Apr 2020	-		3.809	Continuing	Continuing	-
		Subtotal	-	2.905		3.561		3.809		-		3.809	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	2.905		3.561		3.809		-		3.809	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901218F / *Civilian Compensation Program*	**Project (Number/Name)** 674139 / *Civilian Compensation Program*

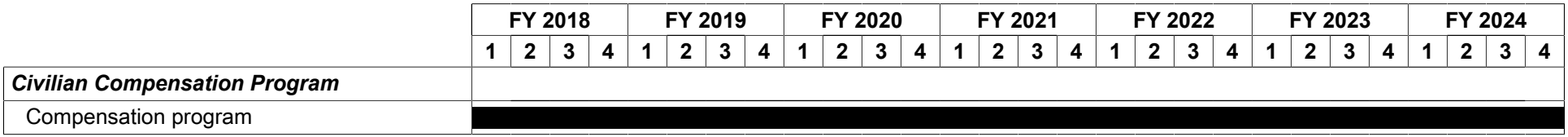

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901218F / *Civilian Compensation Program*	**Project (Number/Name)** 674139 / *Civilian Compensation Program*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Civilian Compensation Program				
Compensation program	1	2018	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0901220F / *Personnel Administration*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	5.404	4.258	6.476	0.000	6.476	6.589	6.725	6.848	6.971	Continuing	Continuing
673318: *Product Data Systems Modernization (PDSM)*	-	0.991	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
675194: *Force Development Transformation*	-	4.413	4.258	6.476	0.000	6.476	6.589	6.725	6.848	6.971	Continuing	Continuing

A. Mission Description and Budget Item Justification

Personnel Services Delivery (PSD), under the Personnel Administration program, funds operational developments necessary to acquire, field, and modify business processes to transform the delivery of Human Resources (HR) capabilities through the structured redesign of the Total Force Personnel Community's people (Active Duty, Reserve, Guard, and Civilians), processes, and technologies. PSD Transformation fundamentally shifts the way personnel services are provided, transitioning from primarily face-to-face interactions with a personnelist to a tiered model with services delivered through online self-service, contact centers, and fewer in-person interactions. PSD supports the migration of legacy applications and other information technologies from on premises data centers to a more sustainable cloud-based hosting solution and flexible services-based architecture as defined by the Defense Enterprise Service Management Framework (DESMF). To this end, PSD executes the prototyping and development of legacy human resource systems through the deployment and transitioning of applications to Department of Defense (DoD) and commercial cloud services.

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

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force					Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*		R-1 Program Element (Number/Name) PE 0901220F / *Personnel Administration*			
B. Program Change Summary ($ in Millions)	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**
Previous President's Budget	7.472	6.358	6.476	0.000	6.476
Current President's Budget	5.404	4.258	6.476	0.000	6.476
Total Adjustments	-2.068	-2.100	0.000	0.000	0.000
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	-2.000	-2.100			
• 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	-0.068	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0901220F / *Personnel Administration*	Project (Number/Name) 673318 / *Product Data Systems Modernization (PDSM)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
673318: *Product Data Systems Modernization (PDSM)*	-	0.991	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In CY 2018 Cadet Administration and Information System (CAMIS) was a new start.

The United States Air Force Academy (USAFA) is currently in the process of modernizing its Cadet Administration and Information System (CAMIS). CAMIS is the USAFA's primary mission system and is used for most functions related to the Cadet Lifecycle including class scheduling, grading, summer programs, performance averages, and graduation/commission requirements tracking. This effort also includes collapsing existing CAMIS IT systems to unique, non-standard processes that remain which include the Cadet Honor System, discipline and accountability, advanced admission, and a replacement for the Cadet Logistics and Supply System (CLASS). The largest component expected to require development includes re-designing the data warehouse to enable Commercial Off the Shelf (COTS) analytic software.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: CAMIS ***Description:*** System development activities associated with modernizing the USAFA CAMIS primary mission system. This system supports most functions related to the Cadet life cycle. ***FY 2019 Plans:*** Effort completed in FY18. ***FY 2020 Plans:*** Effort completed in FY18.	0.991	0.000	0.000
Accomplishments/Planned Programs Subtotals	0.991	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901220F / *Personnel Administration*	**Project (Number/Name)** 673318 / *Product Data Systems Modernization (PDSM)*

D. Acquisition Strategy

CAMIS will modernize the current Student Information System (SIS) to include Recruiting and Admission, Cadet Life Cycle Management, and Cadet Support Services. The majority of efforts are being completed with 3400 sustainment funding and only the data warehouse re-design is covered by this PE. CAMIS is managed by the United States Air Force Academy. All other aspects of the Acquisition Strategy are still in development.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901220F / *Personnel Administration*	**Project (Number/Name)** 673318 / *Product Data Systems Modernization (PDSM)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Data Warehouse Re-design	TBD	TBD : TBD	-	0.991	Jun 2018	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	0.991		-		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.991		0.000		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901220F / *Personnel Administration*	**Project (Number/Name)** 673318 / *Product Data Systems Modernization (PDSM)*

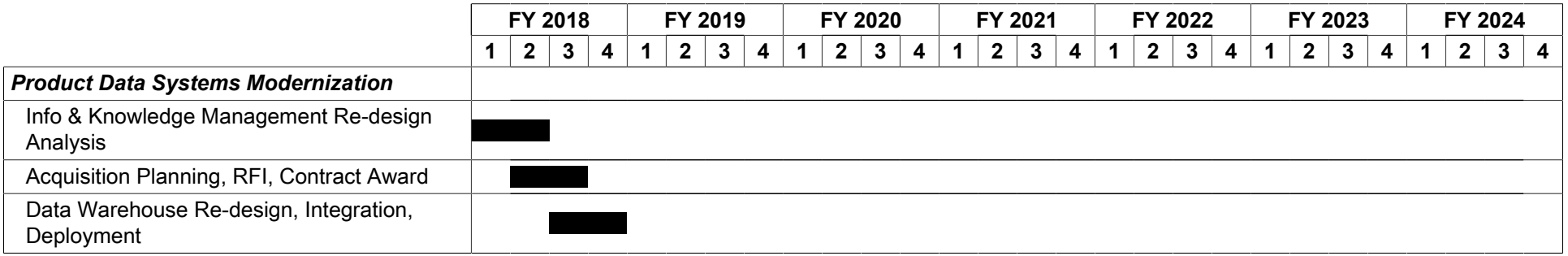

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901220F / *Personnel Administration*	**Project (Number/Name)** 673318 / *Product Data Systems Modernization (PDSM)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Product Data Systems Modernization				
Info & Knowledge Management Re-design Analysis	1	2018	2	2018
Acquisition Planning, RFI, Contract Award	2	2018	3	2018
Data Warehouse Re-design, Integration, Deployment	3	2018	4	2018

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0901220F / *Personnel Administration*	Project (Number/Name) 675194 / *Force Development Transformation*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675194: *Force Development Transformation*	-	4.413	4.258	6.476	0.000	6.476	6.589	6.725	6.848	6.971	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Personnel Services Delivery (PSD), under the Personnel Administration program, funds operational developments necessary to acquire, field, and modify business processes to transform the delivery of Human Resources (HR) capabilities through the structured redesign of the Total Force Personnel Community's people (Active Duty, Reserve, Guard, and Civilians), processes, and technologies. PSD Transformation fundamentally shifts the way personnel services are provided, transitioning from primarily face-to-face interactions with a personnelist to a tiered model with services delivered through online self-service, contact centers, and fewer in-person interactions. PSD supports the migration of legacy applications and other information technologies from on premises data centers to a more sustainable cloud-based hosting solution and flexible services-based architecture as defined by the Defense Enterprise Service Management Framework (DESMF). To this end, PSD executes the prototyping and development of legacy human resource systems through the deployment and transitioning of applications to Department of Defense (DoD) and commercial cloud services. In addition, funds will be used to perform studies and innovative integration efforts for common technology capabilities such as cloud migration, technology development and mobile application.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: AF/A1 Service Oriented Architechture (SOA) Services	1.500	2.500	2.500
Description: Develop reusable business and data sharing SOA services on an established architecture. These services provide authoritative personnel data and business logic to myriad of enterprise processes and systems. ***FY 2019 Plans:*** • Complete delivery of SOA Increment 3 (additional military data elements and update operations) • Complete and deploy reusable business and data sharing SOA services ***FY 2020 Plans:*** • Will continue to develop reusable business and data sharing SOA services (additional military data elements and update operations) ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2019 to FY 2020 Increase/Decrease Statement: SOA transitioning to sustainment in FY 2019. No known further SOA development activities planned in FY 2020, however, residual requirements as well as new emerging requirements will be awarded, as needed.			
Title: Human Resource Systems (HRS) Transition	2.763	1.603	3.817

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901220F / *Personnel Administration*	**Project (Number/Name)** 675194 / *Force Development Transformation*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: In support of the A1 Digital Transformation and Application Data Center Optimization initiatives, identify and document human resource legacy systems for modernization, transition and/or decommission. Support the migration of legacy applications and other information technologies from on premises data centers to a more sustainable cloud-based hosting solution and flexible services-based architecture as defined by the DoD Enterprise Service Framework (DESMF). Rapidly implement human resource capabilities utilizing Commercial-off-the-Shelf (COTS) solutions, Agile incremental delivery, and rapid prototyping. Execute the prototyping and development of legacy human resource systems through the deployment and transitioning of applications to Department of Defense (DoD) and commercial cloud services. ***FY 2019 Plans:*** • Continue migration of apps to an approved Cloud Service Provider • Continue consolidation of apps by life cycle requirements and functionality • Initiate rapid prototyping projects and studies for tiered HR service delivery, HR applications consolidation and cloud-based technology insertion. ***FY 2020 Plans:*** • Will continue rapid prototyping projects and studies for tiered HR service delivery, HR applications consolidation and cloud-based technology insertion. • Will continue migration of apps to an approved Cloud Service Provider • Will continue consolidation of apps by life cycle requirements and functionality ***FY 2019 to FY 2020 Increase/Decrease Statement:*** In support of the A1 Digital Transformation and Application Data Center Optimization initiatives, added activities to rapidly implement human resource capabilities utilizing Commercial-off-the-Shelf (COTS) solutions, Agile incremental delivery, and rapid prototyping.			
Title: Test and Evaluation/Systems Engineering ***Description:*** Transition the Test and Development Environment (T&DE) to an approved Cloud Service Provider. Continued support for all aspects of engineering including software and systems engineering, requirements analysis, configuration management, database administration, and test and evaluation throughout the lifecycle of all Human Resources applications and continued infrastructure development. ***FY 2019 Plans:*** • Continue migration of T&DE capability to an approved Cloud Service Provider • Continue supporting all aspects of engineering including software and systems engineering, requirements analysis, configuration management, and database administration	0.150	0.155	0.159

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901220F / *Personnel Administration*	**Project (Number/Name)** 675194 / *Force Development Transformation*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
• Continue to perform test and evaluation of HRS transition activities including any emergent customer needs and provide system engineering support for the HRS transition ***FY 2020 Plans:*** • Will continue migration of T&DE capability to an approved Cloud Service Provider • Will continue supporting all aspects of engineering including software and systems engineering, requirements analysis, configuration management, and database administration • Will perform test and evaluation of HRS transition activities including any emergent customer needs and provide system engineering support for the HRS transition ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding increase is due to Inflation adjustment.			
Accomplishments/Planned Programs Subtotals	4.413	4.258	6.476

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Personnel Services Delivery employs an evolutionary acquisition strategy to deliver incremental Information Technology, and Human Resources capabilities with development contracts that are awarded in a competitive environment. Rapid prototyping will be used to reduce technology risks, assess Commercial-Off-The-Shelf (COTS) products, and produce technology insertion and migration strategies. In 2015, the government conducted a Full and Open competition for Human Resources System Technical Support and awarded a contract to provide PSD with development and test/technical support. Air Force Program Executive Officer (PEO) for Business and Enterprise Systems (AFPEO BES) is the PEO and Milestone Decision Authority (MDA) for PSD. Air Force Life Cycle Management Center (AFLCMC) is the Contracting Authority for the PSD Program and provides Contracts, Legal and Comptroller support.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901220F / *Personnel Administration*	**Project (Number/Name)** 675194 / *Force Development Transformation*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Service Oriented Architecture	C/FFP	Deloitte Consulting LLP : Alexandria, VA	-	1.158	Aug 2017	2.500	Sep 2019	2.500	Sep 2020	-		2.500	Continuing	Continuing	3.600
Human Resource Systems (HRS) Legacy Systems Study	C/FP	Diligent Consulting Inc. : San Antonio, TX	-	0.458	May 2018	-		-		-		-	Continuing	Continuing	2.853
HRS (Non - AFIPPS Systems Study)	TBD	TBD : TBD	-	0.500	Oct 2018	0.251	Feb 2019	-		-		-	Continuing	Continuing	7.845
HRS Transition Phase 1	TBD	TBD : TBD	-	-		-		1.000	Jan 2020	-		1.000	Continuing	Continuing	-
HRS Transition Phase 2	TBD	TBD : TBD	-	-		-		-		-		-	Continuing	Continuing	-
		Subtotal	-	2.116		2.751		3.500		-		3.500	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering/Technical Support	C/CPFF	Oasis : Lincoln, MA	-	0.152	Apr 2019	0.152	Apr 2020	0.350	Apr 2021	-		0.350	Continuing	Continuing	1.055
FFRDC (SEI) Support	SS/CPAF	CMU-SEI : Pittsburgh, PA	-	0.800	Sep 2018	0.900	Sep 2019	1.000	Sep 2020	-		1.000	Continuing	Continuing	-
		Subtotal	-	0.952		1.052		1.350		-		1.350	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation Support	MIPR	GSA : Atlanta, GA	-	0.035	Apr 2019	0.035	Apr 2020	0.035	Apr 2021	-		0.035	Continuing	Continuing	0.078
Test/Evaluation Support	C/CPIF	Diversified Technical Services, Inc. : San Antonio, TX	-	0.115	Apr 2019	0.120	Apr 2020	0.124	Apr 2021	-		0.124	Continuing	Continuing	1.244
		Subtotal	-	0.150		0.155		0.159		-		0.159	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901220F / *Personnel Administration*	**Project (Number/Name)** 675194 / *Force Development Transformation*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Office Support (PASS, SCS, Travel)	Various	Various : Various	-	1.195	Mar 2019	0.300	Oct 2019	1.467	Oct 2020	-		1.467	Continuing	Continuing	1.357
		Subtotal	-	1.195		0.300		1.467		-		1.467	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	4.413		4.258		6.476		-		6.476	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901220F / *Personnel Administration*	**Project (Number/Name)** 675194 / *Force Development Transformation*

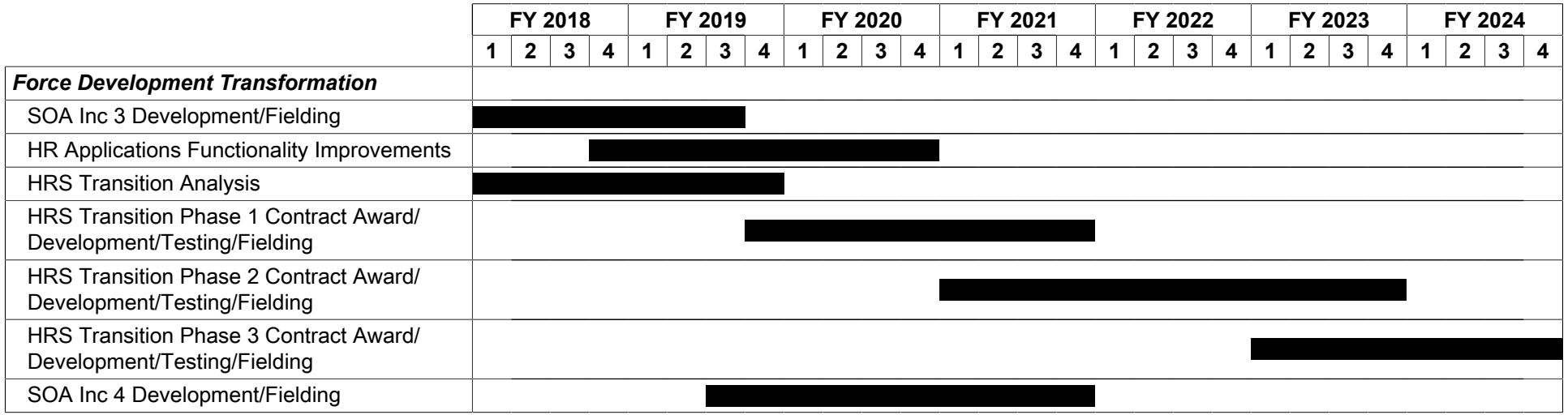

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901220F / *Personnel Administration*	**Project (Number/Name)** 675194 / *Force Development Transformation*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Force Development Transformation				
SOA Inc 3 Development/Fielding	1	2018	3	2019
HR Applications Functionality Improvements	4	2018	4	2020
HRS Transition Analysis	1	2018	4	2019
HRS Transition Phase 1 Contract Award/Development/Testing/Fielding	4	2019	4	2021
HRS Transition Phase 2 Contract Award/Development/Testing/Fielding	1	2021	4	2023
HRS Transition Phase 3 Contract Award/Development/Testing/Fielding	1	2023	4	2024
SOA Inc 4 Development/Fielding	3	2019	4	2021

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0901226F / *Air Force Studies and Analysis Agency*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	1.506	1.418	1.443	0.000	1.443	1.468	1.499	1.526	1.553	Continuing	Continuing
676009: *M & S DEVELOPMENT*	-	1.506	1.418	1.443	0.000	1.443	1.468	1.499	1.526	1.553	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Provides for development and enhancement of modeling and simulation (M&S) tools for strategic planning, operational requirements, modernization and recapitalization of systems and programs, as well as the Planning, Programming, Budgeting and Execution (PPBE) processes for the AF Analytic Community and Secretary of the Air Force Standard Analysis Toolkit in support of AF Senior Leadership. As new technologies are introduced to the battlefield (Digital Electronic Jammers, maneuvering Surface-to-Surface Missiles, Directed Energy Weapons, etc.) along with evolving warfighting techniques and support operations, the range of capabilities that needs to be covered by analytic tools needs to expand as well. M&S creation and enhancement can require extensive research in how to properly implement the emerging weapons capabilities as well as demand development of software techniques to implement the changes. Additionally, emerging and continuing focus areas such as Space, Irregular Warfare, Information Operations, Cyber warfare and ISR demand specific tools of their own for new exploration and development. These focus areas require examination in isolation as well as cross-domain making the problem more complex and increasing the R&D challenges to field new decision support tools.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	1.563	1.418	1.443	0.000	1.443
Current President's Budget	1.506	1.418	1.443	0.000	1.443
Total Adjustments	-0.057	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	-0.057	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0901226F / *Air Force Studies and Analysis Agency*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Modeling and Simulation Development	1.506	1.418	1.443
Description: Develop and Update Modeling & Simulation (M&S) tools. ***FY 2019 Plans:*** Continue research and development of M&S Tools ***FY 2020 Plans:*** Continue research and development of M&S Tools ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding increased to account for increased costs.			
Accomplishments/Planned Programs Subtotals	1.506	1.418	1.443

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

N/A.

E. Acquisition Strategy

Previous and planned future efforts have been/will be awarded under existing Task Order contracts. AF/A9 does not anticipate awarding a new contract for R&D work in the next year.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901226F / *Air Force Studies and Analysis Agency*	**Project (Number/Name)** 676009 / *M & S DEVELOPMENT*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	Various	Not specified. : NV	-	1.506	Mar 2018	1.418	Mar 2019	1.443	Mar 2020	-		1.443	Continuing	Continuing	-
		Subtotal	-	1.506		1.418		1.443		-		1.443	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	1.506		1.418		1.443		-		1.443	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901226F / *Air Force Studies and Analysis Agency*	**Project (Number/Name)** 676009 / *M & S DEVELOPMENT*

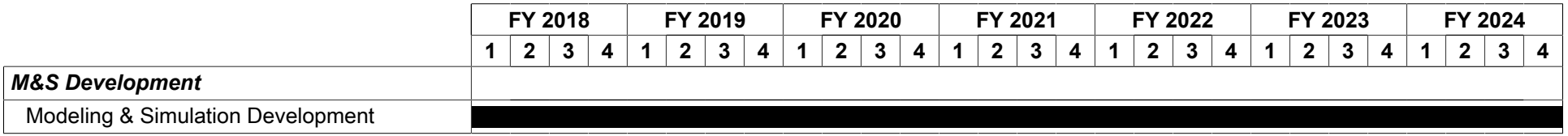

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901226F / *Air Force Studies and Analysis Agency*	**Project (Number/Name)** 676009 / *M & S DEVELOPMENT*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
M&S Development				
Modeling & Simulation Development	1	2018	4	2024

Note

Applying the resources under this PE started in 1Q FY2012 and has continued to develop successful products over time. A9 anticipates work to begin continue for 12-24 months for (1)research into how to better model new friendly and enemy weapons systems, (2) continue to develop tools to better examine evolving weapons technologies and (3) developing new models to better populate the data requirements of existing tools.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0901538F / *Financial Management Information Systems Development*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	628.809	87.802	93.418	9.323	0.000	9.323	7.020	5.193	5.288	5.383	Continuing	Continuing
672222: *Program Budget Enterprise Service (PBES)*	0.000	7.232	15.346	4.359	0.000	4.359	1.971	0.041	0.042	0.043	0.000	29.034
675177: *Cost Estimating Modeling (CEM)*	0.000	4.827	4.954	4.964	0.000	4.964	5.049	5.152	5.246	5.340	Continuing	Continuing
675178: *DEAMS Continuous Capability Development*	0.000	0.000	5.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.500
675179: *Defense Enterprise Accounting Management System Increment 1 (DEAMS Inc 1)*	628.809	75.743	67.618	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	772.170
Program MDAP/MAIS Code: N87												

Note

In FY20, PE 0901554F, DEAMS, changed from PE 0901538F, Financial Management Information Systems Development.
In FY20, Project 675178, DEAMS Continuous Capability Development, changed from Defense Enterprise Accounting Management System Increment 2 (DEAMS Inc. 2).

A. Mission Description and Budget Item Justification

This program element develops upgrades to existing financial management systems. These upgrades are required to comply with auditability and transparency requirements as well as efficiencies in processing financial transactions. This program element also supports studies and analysis to improve future program planning and execution.

There are four projects within this program element: Program and Budget Enterprise Services (PBES), Cost Estimating Modeling (CEM), Defense Enterprise Accounting and Management System (DEAMS) Increment 1 (Inc 1), and DEAMS Continuous Capability Development (CCD), formally known as DEAMS Increment 2.

PBES is a software development effort that will utilize a Service Oriented Architecture (SOA) to deliver budgeting and programming capability for the Air Force and will replace legacy systems (Automated Budget Interactive Data Environment System (ABIDES) and Resource Allocation Programming Information Decision System (RAPIDS), and Enhanced Trade space Tool (ETT) that support the budget formulation and force programming process.

CEM is a knowledge-based study effort to improve Air Force-wide cost estimating by analyzing cost data and recommending changes to estimating models, methods, and tools.

DEAMS development will be governed in Capability Support Phase after Increment 1 Full Deployment (FD).

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0901538F / *Financial Management Information Systems Development*

DEAMS is the Air Force's target core accounting and financial management solution and is a key component of the long-term business process improvements needed to sustain auditability and correct financial system weaknesses.

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

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

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	91.211	99.734	69.667	0.000	69.667
Current President's Budget	87.802	93.418	9.323	0.000	9.323
Total Adjustments	-3.409	-6.316	-60.344	0.000	-60.344
• Congressional General Reductions	0.000	-5.900			
• Congressional Directed Reductions	-0.260	-0.416			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-3.149	0.000			
• Other Adjustments	0.000	0.000	-60.344	0.000	-60.344

Change Summary Explanation

FY19 congressional reduction to maintain DEAMS Continuous Capability Development program affordability.
FY20 funds for DEAMS transitioned to new PE 0901554F

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0901538F / *Financial Management Information Systems Development*	Project (Number/Name) 672222 / *Program Budget Enterprise Service (PBES)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
672222: *Program Budget Enterprise Service (PBES)*	0.000	7.232	15.346	4.359	0.000	4.359	1.971	0.041	0.042	0.043	0.000	29.034
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

PBES will be the single solution software development effort to deliver planning, programming, budgeting and execution (PPBE) capability for the United States Air Force. PBES will replace legacy systems such as the Automated Budget Interactive Data Environment System (ABIDES), Resource Allocation Programming Information Decision System (RAPIDS) and the Enhanced Tradespace Tool (ETT), supporting the budget formulation and force programming process. Upon full deployment of PBES, the system will be compliant with the Standard Financial Information Structure (SFIS) and Standard Line of Accounting (SLOA) conventions, which will enable data standardization across the Department of Defense (DoD).

Utilizing Business Process Re-engineering (BPR), the Air Force has designated PBES as the solution to deliver traceability of financial data in support of the PPBE process. Through the use of BPR, PBES will address excessive overhead, outdated business practices and other time-consuming support activities. PBES will make the budget formulation process more efficient by incorporating business best practices, organizing programming and budgeting personnel, as well as utilizing current technology. PBES will also eliminate checks and balances required of older technology, taking advantage of automated reconciliation services. In addition, the solution will allow the use of Authoritative Data Sources (ADS) for data exposure, resulting in more timely and accurate budget submissions to Office of the Secretary of Defense (OSD), Congress, and other internal and external customers.

A Commercial-off-the-Shelf (COTS) product has been selected as the tool of choice which will require minor configuration changes to meet the stated user requirements. This strategy requires no code changes to the actual COTS product and will drive lower support costs along with making future requirements changes easier in the out-years. Requirements will be satisfied through an iterative process of sprint development cycles, where usable capability is produced and made available to operational users after every sprint. The Integrated Product Office construct along with application of agile principles allows the program to properly plan system requirements, deliver early capability to the end users, achieve early return on investment of taxpayer dollars, division of risk, reduce waste, effectively respond to change, and continuously improve our processes.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver PBES capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: PBES	7.232	15.346	4.359	0.000	4.359

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901538F / *Financial Management Information Systems Development*	**Project (Number/Name)** 672222 / *Program Budget Enterprise Service (PBES)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Description: Software development effort providing modern and enhanced planning, programming, budgeting and execution capabilities to the USAF. Funding supports engineering, cybersecurity, technical development, implementation and automated testing. ACCOMPLISHMENTS: - Stood-up Integration/Development pipeline environments needed for agile development of software and training - Delivered programming/budgeting capability to MAJCOM to support FY21 PB inputs to Air Staff level - Delivered programming/budgeting capability to Air staff to shadow build the FY20 PB - Completed 5 consecutive weeks of MAJCOM testing—tested at every MAJCOM across 15 organizations - Accelerated foundational Planning capability into FY18—delivers capability 1 yr early - Received approval to deploy to MAJCOM and Air staff users to support the FY21 PB build ***FY 2019 Plans:*** - Deliver Sprints 6-12 for test and fielding - Migrate an estimated 40 years-worth of legacy system historical data into PBES module - Develop and deliver first User Productivity on-line training aids for users - Deliver first PBES Planning application for test against FY22 Planning cycle - Deliver OSD interfaces to deliver the AF POM capability - Conduct test for every Sprint delivered and continue POM, Budget, & Planning ad-hoc test - Deliver continuous Sprint patches to make updates to system design & configuration - Continue PBES acquisition planning, reporting, and execution activities - Prepare documentation to support Full Deployment Decision authority to proceed decision - Continue to satisfy risk management framework (RMF) controls needed for authority to operate (ATO) ***FY 2020 Base Plans:*** - Will deliver final Sprints 13 and 14 (AF submission to OSD) for test and fielding - Will migrate remaining legacy system historical data into PBES module - Will complete Full Deployment Authority to Proceed with Milestone Decision Authority - Will deliver patches as needed to correct system deficiencies or upgrades required - Will continue PBES acquisition planning, reporting, and execution activities - Will continue to make updates to system design, configuration, test, and training					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901538F / *Financial Management Information Systems Development*	**Project (Number/Name)** 672222 / *Program Budget Enterprise Service (PBES)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
- Will continue to satisfy risk management framework (RMF) controls needed for ATO ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding decreased due to major program development completing in FY20, early FY21					
Accomplishments/Planned Programs Subtotals	7.232	15.346	4.359	0.000	4.359

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPAF 03 834010: *General Information Technology*	0.000	7.248	1.966	-	1.966	0.695	0.000	0.000	-	0.000	9.909

Remarks

D. Acquisition Strategy

PBES is a Business Category (BCAT) III program following DOD 5000.75 BCAC policy. The PBES strategy, supported by all Stakeholders, was to employ an empowered joint Program Office, Functional Community, and Senior Stakeholder group to rapidly develop, test, and deploy the Air Forces Planning, Programming, Budgeting, and Execution (PPBE) capability within two years. This strategy required mutual trust and risk acceptance by all parties to be successful. Thus far, this strategy has been highly successful delivering PBES capabilities ahead of schedule and substantially under budget.

The first step in this strategy was to utilize early risk reduction efforts (sometimes referred to as "prototyping") to prove the capability and contractors existed to meet user's needs. This was conducted using two 6-month contract vehicles which were both completed months early, delivering several hundred user requirements. The success of these efforts led to the strategy of selecting a COTS product called Oracle Hyperion and to hire a small-business system integrator (SI). The significance in both of these is that the COTS product and the SI have both already been deployed across commercial companies and multiple DoD agencies, thus reducing the risk for implementation by the Government.

Both contract awards for the SI and Oracle licenses were made in 1QFY18, with substantial cost savings received by negotiating bulk license purchases for all AF users. The development strategy was employs agile development methods creating 4-6 week "Sprint" releases to deploy capability rapidly with substantial user feedback along the way. Fourteen total Sprints were planned across two years in an attempt to match on-going Air Force PPBE cycles. As Sprints are developed and tested, they are then deployed for operational use.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901538F / *Financial Management Information Systems Development*	**Project (Number/Name)** 672222 / *Program Budget Enterprise Service (PBES)*

MAJCOMs will first use PBES in Oct 18, for their FY21 POM development and then submit their budget requests up to the Air Staff for their review and creation of the Air Force FY21 POM. Air Staff will primarily use PBES over the legacy system in Jan 19, with continued use throughout the FY21 POM cycle. In FY18, the AF decided to accelerate the PBES Planning application, so AF Planners will first use PBES for the FY22 Plan creation in Feb 19. While PBES will be continually updated throughout these two years, it is also the strategy to migrate all legacy system data into PBES in manageable packages across the two years.

Full deployment of PBES is on schedule to be completed in 1QFY20. The success of this strategy can be attributed to mutual buy-in by all parties, risk acceptance that the solution will not be perfect from the start, and an understanding that not all requirements are exactly known up-front and that changes will be required continuously to be successful.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901538F / *Financial Management Information Systems Development*	**Project (Number/Name)** 672222 / *Program Budget Enterprise Service (PBES)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PBES DEV/TEST LICENSES	C/CPAF	AFLCMC : Maxwell-Gunter AFB, AL	0.000	1.991	Jan 2018	0.100	Jan 2019	0.000		-		0.000	Continuing	Continuing	-
PBES Systems Integrator	C/CPAF	AFLCMC : Maxwell-Gunter AFB, AL	0.000	2.900	Jan 2018	7.984	Jan 2019	1.459		-		1.459	Continuing	Continuing	-
		Subtotal	0.000	4.891		8.084		1.459		-		1.459	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PBES DEV/TEST Hosting	MIPR	HEDC : Hill AFB, UT	0.000	1.400	Jan 2018	3.362	Jan 2019	1.900		-		1.900	Continuing	Continuing	-
Program Management Costs	C/CPAF	AFLCMC : Maxwell-Gunter AFB, AL	0.000	0.941	Apr 2018	3.900	Apr 2019	1.000		-		1.000	Continuing	Continuing	-
		Subtotal	0.000	2.341		7.262		2.900		-		2.900	Continuing	Continuing	N/A

Remarks

Hill AFB Enterprise Data Center

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	7.232		15.346		4.359		-		4.359	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901538F / *Financial Management Information Systems Development*	**Project (Number/Name)** 672222 / *Program Budget Enterprise Service (PBES)*

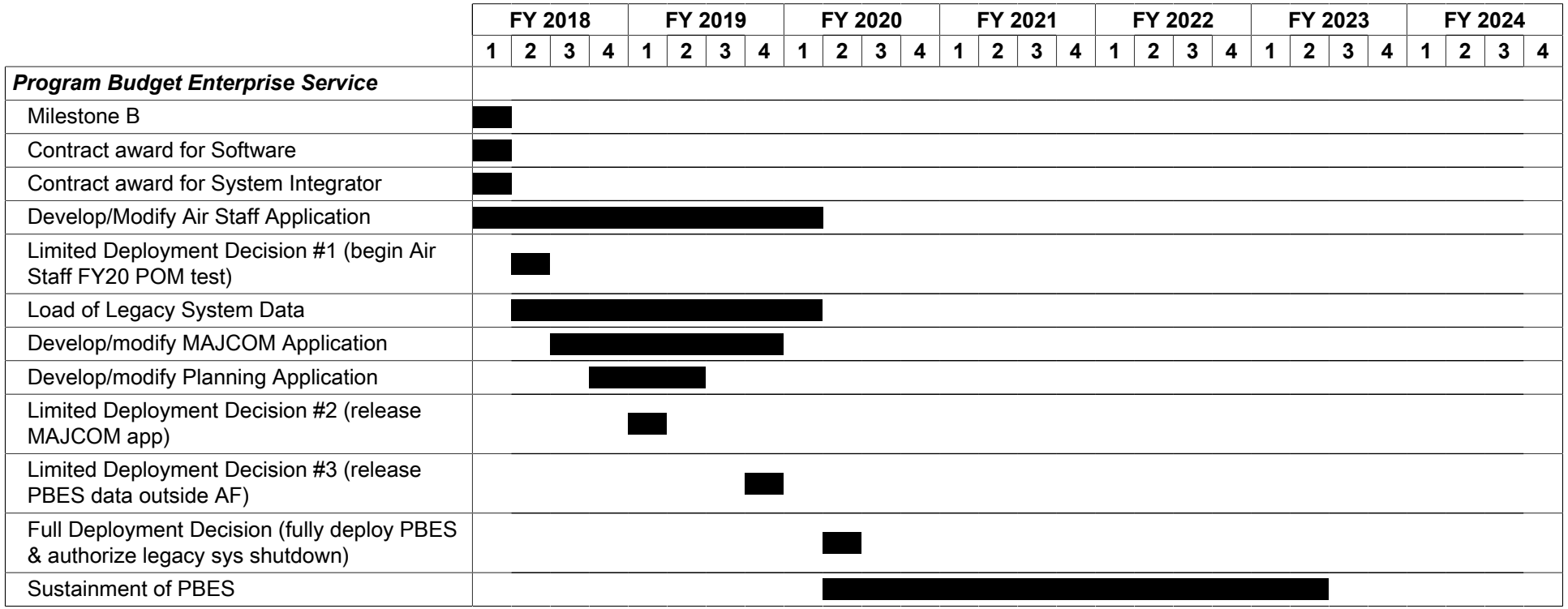

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901538F / *Financial Management Information Systems Development*	**Project (Number/Name)** 672222 / *Program Budget Enterprise Service (PBES)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Program Budget Enterprise Service				
Milestone B	1	2018	1	2018
Contract award for Software	1	2018	1	2018
Contract award for System Integrator	1	2018	1	2018
Develop/Modify Air Staff Application	1	2018	1	2020
Limited Deployment Decision #1 (begin Air Staff FY20 POM test)	2	2018	2	2018
Load of Legacy System Data	2	2018	1	2020
Develop/modify MAJCOM Application	3	2018	4	2019
Develop/modify Planning Application	4	2018	2	2019
Limited Deployment Decision #2 (release MAJCOM app)	1	2019	1	2019
Limited Deployment Decision #3 (release PBES data outside AF)	4	2019	4	2019
Full Deployment Decision (fully deploy PBES & authorize legacy sys shutdown)	2	2020	2	2020
Sustainment of PBES	2	2020	2	2023

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0901538F / *Financial Management Information Systems Development*	Project (Number/Name) 675177 / *Cost Estimating Modeling (CEM)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675177: *Cost Estimating Modeling (CEM)*	0.000	4.827	4.954	4.964	0.000	4.964	5.049	5.152	5.246	5.340	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Cost Estimating Modeling (CEM) provides and enhances Air Force-wide cost estimating capabilities by developing current cost data and estimating methods and tools, data process reengineering, data structure development, and gap filling initiatives. In collaboration with the OSD Cost Assessment Data Enterprise (CADE) project (DoD's unified initiative to collect, organize, store, and use data more efficiently), these products will improve the quality, timeliness, and effectiveness of the acquisition program cost estimates required by statute (e.g., 10 USC 2366, 2433, 2434) and policy directives (e.g., DoDI 5000.02) in support of AF and DoD acquisition decisions, programming and execution decisions, and Congressional mandates.

CEM will ensure the Air Force continuously improves cost estimating capabilities for broad cross-cutting areas, as well as specific to each weapon system type (aircraft, UAVs, ballistic missiles, tactical missiles, munitions, electronics and aircraft modifications, ground stations and automated information systems, space and launch vehicles). Changing technologies, acquisition laws, policy directives, and initiatives drive the need to revise cost estimating processes, methods, and tools. For example, current capability shortfalls reflect gaps in the ability to respond effectively to the laws and regulations such as the FY06 NDAA report (PL 109-163--Provisions relating to Major Defense Acquisition Programs), Weapon System Acquisition Reform Act (WSARA) (provisions related to improving cost estimating quality, especially earlier in the program life-cycle and affordability analysis), Secretary of the Air Force Acquisition Excellence Plan (priorities to improve cost estimating capability and affordability analysis and improved cost estimating support to requirements process), and Office of the Secretary of Defense policy (better buying power initiatives on enhanced trade-off analysis, affordability analysis, and will versus should cost analysis). The CADE and CEM partnership is the lead example for AT&L Better Data initiatives designed as a response to Congressional expressed desire for better outcomes in acquisition. The partnership provides data/analysis/methods/tools and institutional knowledge at the analysts' fingertips versus the status quo inefficient, ad hoc approach.

This project will perform knowledge-based studies to include analyzing historical data and changing technologies/programmatics to develop new estimating methods (e.g. statistical tools, cost estimating relationships) across hundreds of product work breakdown structure elements and functional cost elements within each weapon system type noted above. Examples of areas of cost studies and modeling efforts that cut across all weapon system types are directed energy costs, software cost datasets and metrics; contract or engineering change order studies, analysis, and models; other government cost data, methods, and analysis tools (e.g., depot standup and government test); reliability and maintainability trends and impacts on cost; and fixed price contract performance.

CEM will deliver valuable analytical tools in support of higher quality/credible estimates (as required by statute and regulation) allowing for more realistic cost conscious decisions on over $100B of critical warfighter capability.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901538F / *Financial Management Information Systems Development*	**Project (Number/Name)** 675177 / *Cost Estimating Modeling (CEM)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: CEM	4.827	4.954	4.964	-	4.964
Description: Perform knowledge-based studies (KBS)—Develop/modernize cost data, data collection process improvements, collect and analyze data to develop new estimating methods (e.g. statistical tools, cost estimating relationships (CERs)), and perform other gap filling studies for aircraft, UAVs, ballistic and tactical missiles, munitions, electronics and aircraft modifications, ground stations and automated information systems, space, launch vehicles, and cross-cutting areas. FY18 ACCOMPLISHMENTS: - Completed studies in the areas of Advanced Materials and Manufacturing Processes, Aircraft Reliability Improvements and Life Cycle Cost, Electronic Warfare, Reliability and Maintainability, Joint Cost Analysis Research and Database, Aircraft System Engineering and Program Management, Missile Systems Sufficiency Review Handbook, Radar, Disposal, and Time Phasing - Completed several data collection process reforms ***FY 2019 Plans:*** - Continue to collect historical program data to fill gaps against defined data collection requirements from previous year efforts and integrate historical data collected into CADE system for central access to all DoD - Develop normalized data sets, benchmark metrics, and cost estimating methods/analytical tools with recent data collections - Continue studies started in FY17 and FY18 and begin in areas such as reliability adjustment ratios, fuel consumption and modification cost estimating relationships - Continue to work with OSD CADE team to implement data design and structure requirements and visual analysis tool requirements into CADE system - Conduct weekly reviews with technical/cost teams and quarterly contractor progress reviews with entire government cost community ***FY 2020 Base Plans:*** - Will continue to collect historical program data to fill gaps against defined data collection requirements from previous year efforts and integrate historical data collected into CADE system for central access to all DoD - Will develop normalized data sets, benchmark metrics, and cost estimating methods/analytical tools with recent data collections - Will continue studies started in FY17/18/19 and begin in areas such as ground/airborne radios/terminals, O&S shortfalls cost, fuel consumption, engineering change order benchmarks and directed energy cost					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901538F / *Financial Management Information Systems Development*	**Project (Number/Name)** 675177 / *Cost Estimating Modeling (CEM)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
- Will continue to work with OSD CADE team to implement data design and structure requirements and visual analysis tool requirements into CADE system - Will conduct weekly reviews with technical/cost teams and quarterly contractor progress reviews with entire government cost community ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Slight increase due to tax adjustments over time.					
Accomplishments/Planned Programs Subtotals	4.827	4.954	4.964	-	4.964

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

N/A

D. Acquisition Strategy

Contracts are expected to be firm-fixed price and/or cost plus, and will be awarded through full and open competition and follow Federal Acquisition Regulations (FAR) guidelines. Headquarters Air Force will provide contract management oversight and direction. Contracted knowledge-based studies progress will be reviewed on a quarterly basis and adjusted as appropriate.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901538F / *Financial Management Information Systems Development*	**Project (Number/Name)** 675177 / *Cost Estimating Modeling (CEM)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CEM: Aircraft / UAVs	Various	Various : Various	0.000	2.609	Feb 2018	1.485	Feb 2019	1.600	Feb 2020	-		1.600	Continuing	Continuing	-
CEM: Ballistic Missiles	C/CPFF	Various : Various	0.000	0.124	Sep 2016	0.180	Sep 2016	0.200	Sep 2016	-		0.200	Continuing	Continuing	-
CEM: Electronics, Aircraft Modifications	C/CPFF	Various : Various	0.000	0.205	Sep 2016	0.300	Sep 2016	0.300	Sep 2016	-		0.300	Continuing	Continuing	-
CEM: Ground Stations, Automated Information Systems	C/CPFF	Various : Various	0.000	0.222	Sep 2016	0.525	Sep 2016	0.530	Sep 2016	-		0.530	Continuing	Continuing	-
CEM: Cross-Cutting Studies	Various	Various : Various	0.000	1.144	Feb 2018	1.014	Feb 2019	0.884	Feb 2020	-		0.884	Continuing	Continuing	-
CEM: Space, Launch Vehicles	C/CPFF	Various : Various	0.000	0.448	Sep 2016	1.060	Sep 2016	1.050	Sep 2016	-		1.050	Continuing	Continuing	-
CEM: Tactical Missiles, Munitions	C/CPFF	Various : Various	0.000	0.075	Sep 2016	0.390	Sep 2016	0.400	Sep 2016	-		0.400	Continuing	Continuing	-
		Subtotal	0.000	4.827		4.954		4.964		-		4.964	Continuing	Continuing	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	4.827		4.954		4.964		-		4.964	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901538F / *Financial Management Information Systems Development*	**Project (Number/Name)** 675177 / *Cost Estimating Modeling (CEM)*

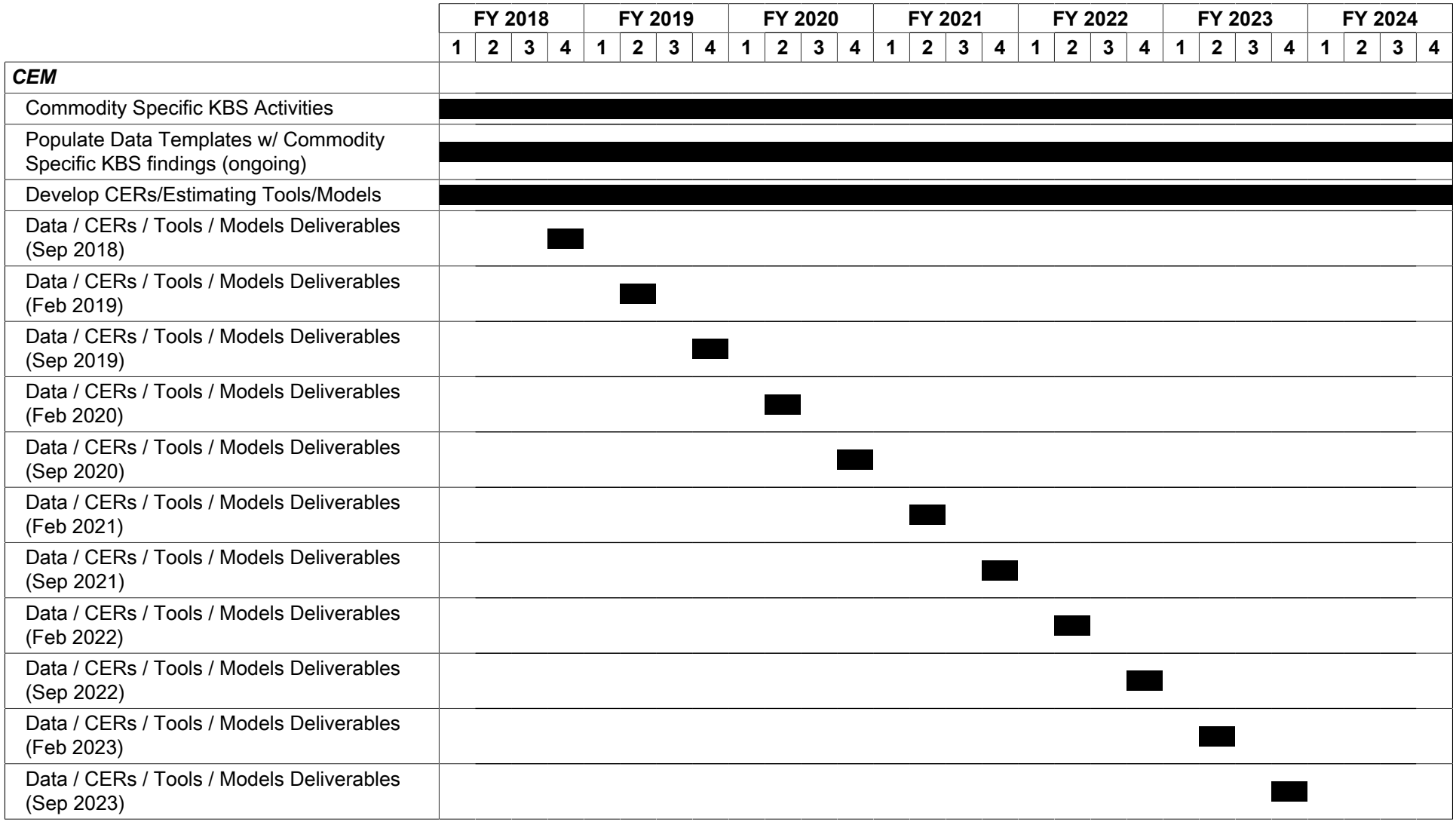

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901538F / *Financial Management Information Systems Development*	**Project (Number/Name)** 675177 / *Cost Estimating Modeling (CEM)*

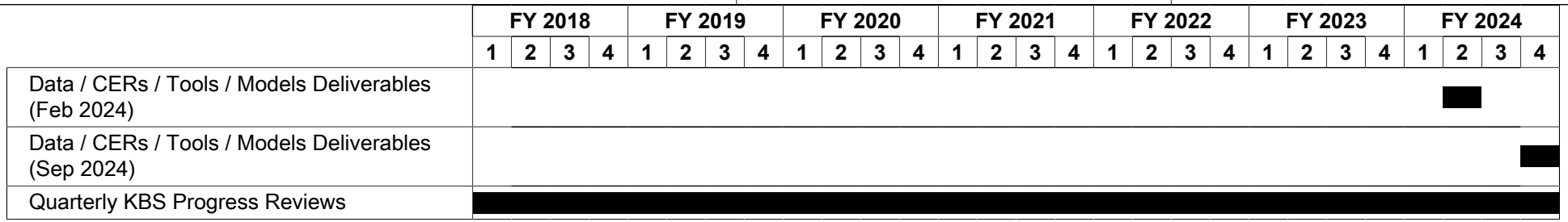

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901538F / *Financial Management Information Systems Development*	**Project (Number/Name)** 675177 / *Cost Estimating Modeling (CEM)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
CEM				
Commodity Specific KBS Activities	1	2018	4	2024
Populate Data Templates w/ Commodity Specific KBS findings (ongoing)	1	2018	4	2024
Develop CERs/Estimating Tools/Models	1	2018	4	2024
Data / CERs / Tools / Models Deliverables (Sep 2018)	4	2018	4	2018
Data / CERs / Tools / Models Deliverables (Feb 2019)	2	2019	2	2019
Data / CERs / Tools / Models Deliverables (Sep 2019)	4	2019	4	2019
Data / CERs / Tools / Models Deliverables (Feb 2020)	2	2020	2	2020
Data / CERs / Tools / Models Deliverables (Sep 2020)	4	2020	4	2020
Data / CERs / Tools / Models Deliverables (Feb 2021)	2	2021	2	2021
Data / CERs / Tools / Models Deliverables (Sep 2021)	4	2021	4	2021
Data / CERs / Tools / Models Deliverables (Feb 2022)	2	2022	2	2022
Data / CERs / Tools / Models Deliverables (Sep 2022)	4	2022	4	2022
Data / CERs / Tools / Models Deliverables (Feb 2023)	2	2023	2	2023
Data / CERs / Tools / Models Deliverables (Sep 2023)	4	2023	4	2023
Data / CERs / Tools / Models Deliverables (Feb 2024)	2	2024	2	2024
Data / CERs / Tools / Models Deliverables (Sep 2024)	4	2024	4	2024
Quarterly KBS Progress Reviews	1	2018	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0901538F / *Financial Management Information Systems Development*	Project (Number/Name) 675178 / *DEAMS Continuous Capability Development*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675178: *DEAMS Continuous Capability Development*	0.000	0.000	5.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.500
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY20, PE 0901554F, DEAMS, changed from PE 0901538F, Financial Management Information Systems Development.
In FY20, Project 675178, DEAMS Continuous Capability Development, changed from Defense Enterprise Accounting Management System Increment 2 (DEAMS Inc. 2).

A. Mission Description and Budget Item Justification

Defense Enterprise Accounting and Management System (DEAMS) is a commercial-off-the-shelf (COTS), Oracle-based software implementation effort that will provide an auditable, modern accounting and finance system. DEAMS is a Joint United States Air Force (USAF) and United States Transportation Command (USTRANSCOM) Enterprise Resource Planning (ERP) Program that will replace many existing accounting and finance legacy systems and will provide core funds execution management functions consistent with financial management laws, regulations and policy, general ledger, funds management, payments, receivables, cost and revenues, and fiduciary reporting. DEAMS is compliant with the Clinger-Cohen Act, Business Enterprise Architecture (BEA), and integrates into Global Combat Support System-Air Force (GCSS-AF). When fully deployed, DEAMS will be key to Air Force compliance with the Financial Improvement and Audit Readiness (FIAR) requirement in the 2010 NDAA.

The remaining DEAMS Increment 1 development activities will be completed using agile software development methodologies under a project called DEAMS Rapid Acquisition. As a Section 873 Agile Pilot program, Rapid Acquisition will also be a stepping stone in the implementation of agile development methodologies for DEAMS Continuous Capability Development (CCD). Under Rapid Acquisition, the program contracted with a new System Integrator (SI) to sustain the DEAMS R12 baseline, develop the remaining Inc. 1 requirements (disbursing, reporting, Governance/Risk/Compliance (GRC)), and provide continual enhancement and improvement to the deployed system, utilizing agile software development.

DEAMS CCD capabilities will be implemented utilizing an agile software development methodology. Requirements for CCD include, but are not limited to, development of the core accounting and reporting functionality necessary to enable deployment of modernized personnel, contracting, and logistics systems. Additional capabilities under requirements definition include complex acquisition management, reimbursable cost accounting, military entitlement accounting, advanced accounting controls and audit sustainment, treasury cash accountability, and management accounting and billing for revolving funds. Included in these capabilities are selected requirements deferred from Increment 1.

Requirements will be addressed through an iterative process of sprint development cycles, where usable capability is produced after every sprint. The PMO construct along with application of agile principles allows the program to properly plan system requirements, deliver early capability to the end users, achieve early return on investment of taxpayer dollars, division of risk, reduce waste, effectively respond to change, and continuously improve our processes.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901538F / *Financial Management Information Systems Development*	**Project (Number/Name)** 675178 / *DEAMS Continuous Capability Development*

Additional user deployments enabled by future increment capabilities include acquisition program executive offices; ranges, laboratories and test centers; and air logistics centers. CCD adds an additional 4,600 users to the Inc 1 baseline for a total of 21,500 users.

This funding request will support development of the Business Capability Acquisition Cycle (BCAC) compliance information artifacts and plans necessary to support the program, Capability Process Maps (CPMs) for each business capability, and mapping of financial management processes the capability will require (Blueprinting). Additionally, the funding will support acquisition strategy planning by early identification/definition of Information Technology Functional Requirements (ITFRs) and Information Assets (IA), Acquisition Strategy Determination, Solution Approach, and Request for Proposal (RFP) preparation.

Funds may be used to develop, acquire, and integrate hardware and software solutions to provide improvements and enhancements in support of the development of the DEAMS capabilities.

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

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Defense Enterprise Accounting and Management System (DEAMS) capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, and 0605898F.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: DEAMS Continuous Capability Development (CCD) Product Development	0.000	5.500	0.000	0.000	0.000
Description: DEAMS CCD system capabilities will be developed and enhanced through completion of development sprint cycles in accordance with an agile software development strategy. DEAMS expects to leverage lessons learned during the Increment I rapid acquisition to develop a T&E process that is more complimentary to the Agile software development process. Development activities include requirements analysis, design, build, test, data conversion, cut-over from legacy systems, and the resolution of deficiency reports and defects. Also includes the support services (product development support, solution architecture support, configuration control and management support, quality assurance support, acquisition strategy support, test planning support, and cybersecurity support) of various Advisory and Assistance Services (A&ASs), Program Management Administration (PMA) activities, and Federally Funded Research and Development Centers (FFRDCs). ***FY 2019 Plans:*** - Will begin Technical support services for requirements definition and analysis and System Integrator request for proposal (RFP) development - Will begin Acquisition planning and support for CCD system capabilities to include but not limited to:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901538F / *Financial Management Information Systems Development*	**Project (Number/Name)** 675178 / *DEAMS Continuous Capability Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
- Acquisition Contracting Interfaces - Foreign Military Sales (FMS) - Budget Distribution Interface - Conversion interface with System Integrator					
FY 2020 Base Plans: - Continue Technical support services for requirements definition and analysis and System Integrator request for proposal (RFP) development - Continue Acquisition planning and support for first set of agile development epics supporting Continuous Capability Development (CCD) system capabilities to include but not limited to: - Ad Hoc Cost Analysis Reporting - Additional Business Intelligence (BI) functionality - Base Supply Expenditures General Funds only - Accounting for base supply purchases - Treasury Direct Phase 2 & 3 - Implements Treasury Direct collections - Civilian Pay Cost Accounting - Record Civilian Pay detail for accruals and expenditure accounting - Contract Data Standards - Implements Acquisition data standards for contract writing systems - Major Acquisition/Reimbursable Program Systems - Interfaces/Capabilities necessary for major acquisition programs reporting and Complex contract obligation and pre-validation - Job Order Cost Accounting - Interface enhancement of Job Order Cost Accounting System (JOCAS) II with Standard Financial Information Structure (SFIS) upgrade - Initiate test planning for Agile acquisition					
FY 2020 OCO Plans: N/A					
FY 2019 to FY 2020 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901538F / *Financial Management Information Systems Development*	**Project (Number/Name)** 675178 / *DEAMS Continuous Capability Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Funding decreases due to PE 0901554F, DEAMS, changing from PE 0901538F, Financial Management Information Systems Development.					
Accomplishments/Planned Programs Subtotals	0.000	5.500	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPAF 03 834470: *Defense Enterprise Accounting & Mgt Sys*	1.000	0.802	1.905	0.000	1.905	0.900	3.107	3.162	3.219	Continuing	Continuing

Remarks

D. Acquisition Strategy

The DEAMS Continuous Capability Development (CCD) acquisition strategy will leverage experience gained from FY19 NDAA Section 869 Pilot Program activities and from agile software development efforts in Increment 1. CCD will be implemented using an agile methodology approach following the Business Capability Acquisition Cycle (BCAC). DEAMS will be in the Capability Sustainment Phase 5 (per DOD Instruction 5000.75) and will conduct continual enhancement/process improvements for the life of the program. DEAMS will continue technical support services for requirements definition and analysis and System Integrator request for proposal (RFP) development, and continue acquisition planning and support for first set of agile development epics supporting CCD system capabilities.

CCD will deliver functionality at earliest opportunity on a stable Increment 1 baseline. User experience and mission impact will be taken into account when establishing the release battle rhythm to the operational system. Factors for software releases include:
- Budget formulation and justification cycles
- End of year financial closeout
- Interdependencies with enterprise business systems
- Higher DOD requirements
- On-going development efforts with LOG-IT, CON-IT, MRO, AFIPPS, and other legacy systems
- Interfaces/data standards changes
- Changes to hosting, deployment technologies, or strategies to optimize system security, performance, and cost savings

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901538F / *Financial Management Information Systems Development*	**Project (Number/Name)** 675178 / *DEAMS Continuous Capability Development*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Administrative (PMA) Costs	Various	Various : Various	0.000	-		5.500	Apr 2019	-		-		-	0.000	5.500	-
		Subtotal	0.000	-		5.500		-		-		-	0.000	5.500	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	-		5.500		-		-		-	0.000	5.500	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901538F / *Financial Management Information Systems Development*	**Project (Number/Name)** 675178 / *DEAMS Continuous Capability Development*

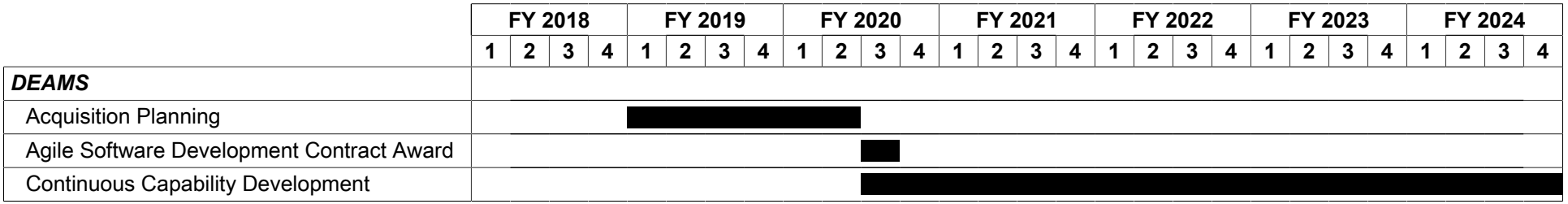

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901538F / *Financial Management Information Systems Development*	**Project (Number/Name)** 675178 / *DEAMS Continuous Capability Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
DEAMS				
Acquisition Planning	1	2019	2	2020
Agile Software Development Contract Award	3	2020	3	2020
Continuous Capability Development	3	2020	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0901538F / *Financial Management Information Systems Development*	Project (Number/Name) 675179 / *Defense Enterprise Accounting Management System Increment 1 (DEAMS Inc 1)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675179: *Defense Enterprise Accounting Management System Increment 1 (DEAMS Inc 1)*	628.809	75.743	67.618	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	772.170
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY20, PE 0901554F, DEAMS, changes from PE 0901538F, Financial Management Information Systems Development.

A. Mission Description and Budget Item Justification

Defense Enterprise Accounting and Management System (DEAMS) is a commercial-off-the-shelf (COTS), Oracle-based software implementation effort that will provide an auditable, modern accounting and finance system. DEAMS is a Joint United States Air Force (USAF) and United States Transportation Command (USTRANSCOM) Enterprise Resource Planning (ERP) Program that will replace many existing accounting and finance legacy systems and will provide core funds execution management functions consistent with financial management laws, regulations and policy, general ledger, funds management, payments, receivables, cost and revenues, and fiduciary reporting. DEAMS is compliant with the Clinger-Cohen Act, Business Enterprise Architecture (BEA), and integrates into Global Combat Support System-Air Force (GCSS-AF). When fully deployed, DEAMS will be key to Air Force compliance with the Financial Improvement and Audit Readiness (FIAR) requirement in the 2010 NDAA.

DEAMS user deployments include:
- Air Mobility Command (AMC) without Transportation Working Capital Funds (TWCF)
- AMC with TWCF, in conjunction with Defense Finance and Accounting Service (DFAS) Rome
- Air Combat Command (ACC) and Air Force Global Strike Command (AFGSC)
- Air Force Reserve Command (AFRC), and Air National Guard (ANG) and other Geographically Separated Units (GSUs) to include DFAS Limestone, Air Force District of Washington (AFDW), Air Force Special Operations Command (AFSOC), U.S. Air Force Academy (USAFA), Pacific Air Forces (PACAF), and DFAS Japan
- U. S. Air Forces in Europe (USAFE), DFAS Europe, and Air Education and Training Command (AETC), Joint Base San Antonio
- Air Force Material Command (AFMC) and Air Force Space Command (AFSPC) (Incremental Deployments)
- Remaining DFAS locations and all other GSUs

On 23 January 2017, the senior official provided the Critical Change Report (CCR) with certifications to Congress. The report recommended a restructure of DEAMS from one increment to multiple increment. The Milestone Decision Authority (MDA) approved the restructured program for DEAMS Inc 1, to include deferring certain requirements to future increments, a limited deployment to an additional 700 users for Inc 1 to United States Air Force in Europe (USAFE), and the updated Full Deployment Authority to Proceed (FD ATP) criteria via an Acquisition Decision Memorandum (ADM) dated 2 June 2017. (FD ATP date is August 2020 and Capability Support Authority to Proceed (CS ATP) date is February 2021.)

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901538F / *Financial Management Information Systems Development*	**Project (Number/Name)** 675179 / *Defense Enterprise Accounting Management System Increment 1 (DEAMS Inc 1)*

The remaining DEAMS Inc 1 schedule includes the Oracle e-Business Suite R12 upgrade and development and deployment of the remaining Increment 1 capabilities (disbursing, reporting, and Governance/Risk/Compliance (GRC)), as well as enhancements and improvements to the existing baseline. In accordance with the FY19 NDAA, DEAMS is an Agile Pilot program as defined in Sec 873 of the FY18 NDAA, and all remaining development will be accomplished using agile software development methodologies.

DEAMS Inc 1 is developing capability which allows for deployment to the remaining user locations. However, DEAMS has also begun transitioning the support of previously deployed locations to the Operation and Support (O&S) phase.

Funds may be used to develop, acquire, and integrate hardware and software solutions to provide improvements and enhancements in support of the development of the DEAMS capabilities.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver financial management information systems capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Product Development	74.754	66.740	0.000	0.000	0.000
Description: DEAMS Inc 1 capability development activities support multiple software releases and user deployments as described in the mission description. Development activities include design, build, test, data conversion, reporting, cutover from legacy systems, and the resolution of deficiency reports and defects. Activities also include hardware support (system administration and database security) and storage service by Defense Information Systems Agency (DISA); continued development of interface to Global Combat Support System - Air Force (GCSS-AF); Enterprise Resource Planning (ERP) Common Computing Environment (CCE); Independent Verification and Validation (IV&V); Developmental Release Field Support (DRFS) to include process execution and data scripts; help desk support; Engineering Integration Services (EIS) for oversight of development tools and processes; deployment training and change management activities. Provides acquisition, contract, finance, and cost management planning and Program Management Administration (PMA) utilizing an agile approach for reporting, disbursing, and auditing initiatives. Develop, using an Agile software development approach, the Disbursing Initiative (includes modernizing disbursing and implementing daily reconciliation with the U.S. Treasury, which will manage the receipt and acceptance of agreements, orders, and invoices), the Reporting Initiative (establish a modernized Business					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901538F / *Financial Management Information Systems Development*	**Project (Number/Name)** 675179 / *Defense Enterprise Accounting Management System Increment 1 (DEAMS Inc 1)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Intelligence reporting solution), and the Segregation of Duties (SOD) Initiative (allow DEAMS to meet regulatory compliance requirements associated with Financial Information System Controls Audit Manual (FISCAM)). Accomplishments: - As of 9 Aug 2018, 155 of 170 Installations migrated to DEAMS Inc 1 and 14,700 of 16,900 end users migrated to Inc 1 - Successfully deployed to US Air Forces in Europe Major Command - Successful FY18 end of year closeout ***FY 2019 Plans:*** - Continue development and deployment of E-Business Suite (EBS) R12 software - Will continue development/integration of DEAMS disbursing initiative, auditing, and long term reporting using Agile Software Development - Will continue to work DEAMS enhancements and improvements - Will continue remaining development activities to develop capability in support of remaining deployments - Will continue program office support activities ***FY 2020 Base Plans:*** N/A ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** In FY20, PE 0901554F, DEAMS, changes from PE 0901538F, Financial Management Information Systems Development.					
Title: Test and Evaluation (T&E)	0.989	0.878	0.000	0.000	0.000
Description: The T&E process will be a complete system operational test to determine DEAMS effectiveness, suitability, and mission capability using the R12 Upgrade. It begins with validation of requirements and end to end functional capabilities including compliance mandates. The T&E effort are conducted in developer sites, Air Force test sites, DISA production sites, and user locations. The DEAMS Test and Evaluation Master Plan (TEMP), Lead Developmental Test Organization (LDTO) Integrated Test Plan (ITP), System Integrators (SIs) Software Test Plans (STPs), and Operational Test Agency (OTA) operational test plans covers the details of					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901538F / *Financial Management Information Systems Development*	**Project (Number/Name)** 675179 / *Defense Enterprise Accounting Management System Increment 1 (DEAMS Inc 1)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Increment 1 T&E. Database Administrator (DBA) Test Support required to service test instances. Capabilities Integration Environment (CIE) Integration/Development support for ancillary Test activities required. Hardware and software required for test activities. The T&E effort for the Agile Pilot Program includes Sprint Testing where functionality developed code in the sprint is tested for conformance to functional and non-functional requirements. Sprint Testing shall address unit and integrated testing. Additionally, there will be Regression Testing to validate that the work within the sprint has not introduced defects into areas of the product not directly impacted by the work of the sprint and has not introduced defects into cross-product dependencies such as interfaces. ***FY 2019 Plans:*** - Continue validation of software and hardware releases and other system updates for DEAMS Inc1 - Continue scheduled test events to add confidence to the revised schedule, and DEAMS critical change - Continue preparations for and begin Follow-on Operational Test and Evaluation (FOT&E) - Continue development/integration of DEAMS disbursing initiative and other system capabilities ***FY 2020 Base Plans:*** N/A ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** In FY20, PE 0901554F, DEAMS, changes from PE 0901538F, Financial Management Information Systems Development.					
Accomplishments/Planned Programs Subtotals	75.743	67.618	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPAF 03 834470: *Defense Enterprise Accounting and Mgmt System*	1.000	0.802	1.905	-	1.905	0.900	3.107	3.162	3.219	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901538F / *Financial Management Information Systems Development*	**Project (Number/Name)** 675179 / *Defense Enterprise Accounting Management System Increment 1 (DEAMS Inc 1)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost

Remarks

D. Acquisition Strategy

DEAMS Inc 1 is over 87% deployed as the baseline viable product for the AF operational finance community. The program relies on heavy customer involvement through the functional management office to govern system changes, requirements development, and day-to-day customer support. DEAMS will employ multiple contract actions as the various Development Activities and Releases are developed, tested, and deployed through FY 2020.

DEAMS Inc 1 accelerated deployment to Air Combat Command (ACC), Air Education & Training Command (AETC), and AF Reserve Command (AFRC) tenant users from FY20 to FY19. This user base was orphaned from ACC, AETC, and AFRC because they reside on bases owned by other Major Commands.

AF Space Command and AF Materiel Command Incremental users at the base operations level will migrate to DEAMS Inc 1 capability in FY20 as planned.

In the FY19 NDAA, DEAMS was selected as an FY18 NDAA Sec 873 Agile Pilot program. To facilitate the transition from traditional to agile software development, Increment 1 development items will be completed under a new rapid acquisition contract action using agile software development methods. This new effort will also inform and facilitate the agile program implementation for DEAMS Continuous Capability Development.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901538F / *Financial Management Information Systems Development*	**Project (Number/Name)** 675179 / *Defense Enterprise Accounting Management System Increment 1 (DEAMS Inc 1)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DEAMS DRFS (Post Production Support, Level 2/3 Help Desk Support), System Stabilization, Design, Blueprint, Code, Development tools/ processes, etc.	C/FFP	Accenture Federal Services LLC : Various	229.182	14.401	Oct 2017	1.528	Oct 2018	-		-		-	0.000	245.111	-
DEAMS: Computing and storage support, system administration, security, storage, etc.	MIPR	DISA : Various	35.344	0.060	Oct 2017	0.032	Oct 2018	-		-		-	0.000	35.436	-
DEAMS: Direct Mission Support (Development/ Integration Environments)	Various	Various : Various	103.852	2.026	Oct 2017	9.739	Oct 2018	-		-		-	0.000	115.617	-
DEAMS: SME Support, General Ledger Reports and Analysis, Business Process Analysis, Master Data Conversion and Training Development	C/T&M	Various : Various	116.008	36.231	Mar 2018	27.310	Mar 2019	-		-		-	0.000	179.549	-
DEAMS FFRDC ERP Engineering	C/Various	The MITRE Corporation : Various	13.203	2.110	Oct 2017	2.500	Oct 2018	-		-		-	0.000	17.813	-
DEAMS: ETASS (Engineering)	C/CPFF	Jacobs Technology : Dayton, OH	40.178	3.280	Feb 2018	5.355	Feb 2019	-		-		-	0.000	48.813	-
DEAMS: DTUS	C/FFP	DSD Laboratories, Inc : Sudbury, MA	0.000	0.000	Jan 2018	-		-		-		-	0.000	0.000	-
DEAMS: Rapid Acquisition	C/CPAF	CACI-ISS, INC : Chantilly, VA	0.000	1.000	Dec 2018	15.000	Apr 2019	-		-		-	0.000	16.000	-
DEAMS ERP Solutions Architecture services	C/FFP	Lintech Global Inc. : Farmington Hills, MI	32.937	6.264	Feb 2018	-		-		-		-	0.000	39.201	-
DEAMS: ERP DBA Development and Support Services	C/FFP	DDC IT Services : Albuquerque, NM	7.865	1.564	Jun 2018	3.376	Feb 2019	-		-		-	0.000	12.805	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901538F / *Financial Management Information Systems Development*	**Project (Number/Name)** 675179 / *Defense Enterprise Accounting Management System Increment 1 (DEAMS Inc 1)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	578.569	66.936		64.840		-		-		-	0.000	710.345	N/A

Remarks

DIRC: DEAMS Increment 1 Requirements Continuation
DTUS: DEAMS Technical Upgrade and Sustainment
DRFS: Developmental Release Field Support
DISA: Defense Information Systems Agency
ERP: Enterprise Resource Planning
ESB: Enterprise Service Bus
ETASS: Engineering and Technology Acquisition Support Services
FFRDC: Federally Funded Research and Development Center
GCSS-AF: Global Combat Support System - Air Force
SME: Subject Matter Expert

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DEAMS: Test services from AFOTEC, JITC, LDTO and other miscellaneous test resources	MIPR	Various : Various	14.280	0.989	Oct 2017	0.878	Oct 2018	-		-		-	0.000	16.147	-
		Subtotal	14.280	0.989		0.878		-		-		-	0.000	16.147	N/A

Remarks

AFOTEC: Air Force Operational Test and Evaluation Center
JITC: Joint Interoperability Test Command
LDTO: Lead Developmental Test Organization

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901538F / *Financial Management Information Systems Development*	**Project (Number/Name)** 675179 / *Defense Enterprise Accounting Management System Increment 1 (DEAMS Inc 1)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DEAMS:Program Management Administration	Various	AFLCMC : Wright-Patterson AFB, OH	35.960	7.818	Oct 2017	1.900	Oct 2018	-		-		-	0.000	45.678	-
		Subtotal	35.960	7.818		1.900		-		-		-	0.000	45.678	N/A

Remarks

A&AS: Advisory & Assistance Services

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	628.809	75.743		67.618		-		-		-	0.000	772.170	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901538F / *Financial Management Information Systems Development*	**Project (Number/Name)** 675179 / *Defense Enterprise Accounting Management System Increment 1 (DEAMS Inc 1)*

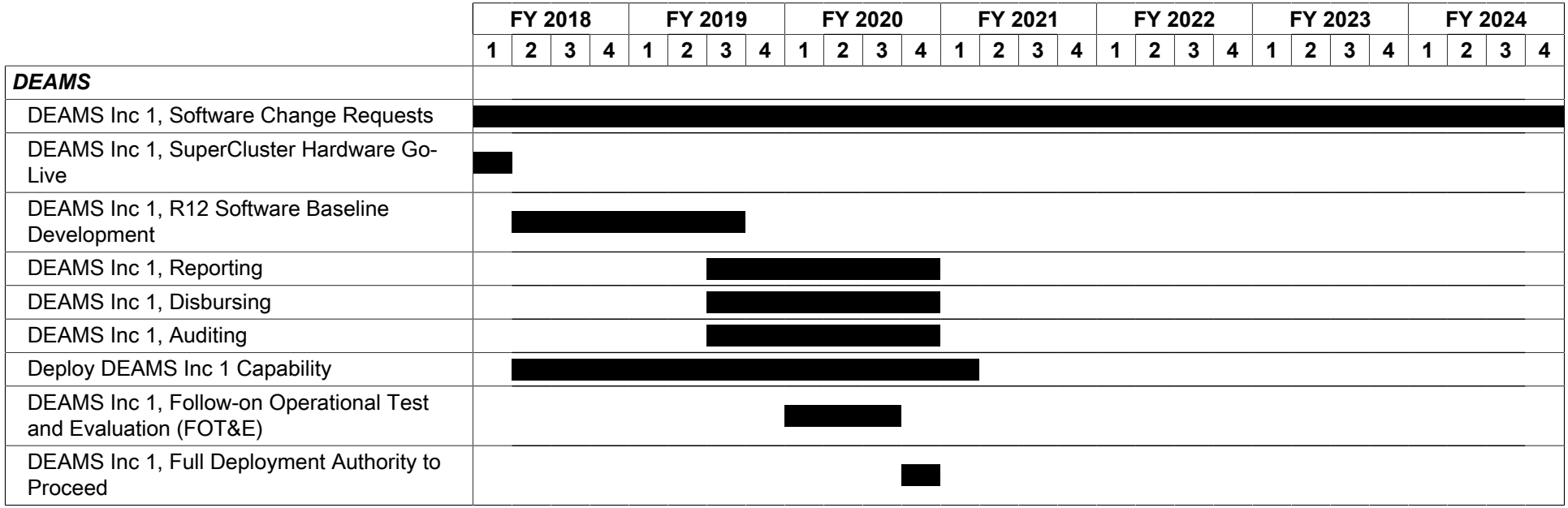

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901538F / *Financial Management Information Systems Development*	**Project (Number/Name)** 675179 / *Defense Enterprise Accounting Management System Increment 1 (DEAMS Inc 1)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
DEAMS				
DEAMS Inc 1, Software Change Requests	1	2018	4	2024
DEAMS Inc 1, SuperCluster Hardware Go-Live	1	2018	1	2018
DEAMS Inc 1, R12 Software Baseline Development	2	2018	3	2019
DEAMS Inc 1, Reporting	3	2019	4	2020
DEAMS Inc 1, Disbursing	3	2019	4	2020
DEAMS Inc 1, Auditing	3	2019	4	2020
Deploy DEAMS Inc 1 Capability	2	2018	1	2021
DEAMS Inc 1, Follow-on Operational Test and Evaluation (FOT&E)	1	2020	3	2020
DEAMS Inc 1, Full Deployment Authority to Proceed	4	2020	4	2020

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0901554F / *Defense Enterprise Acntng and Mgt Sys (DEAMS)*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	46.789	0.000	46.789	57.016	55.151	50.064	50.965	Continuing	Continuing
675178: *DEAMS Continuous Capability Development*	-	0.000	0.000	14.895	0.000	14.895	57.016	55.151	50.064	50.965	Continuing	Continuing
675179: *Defense Enterprise Accounting Management System Increment 1 (DEAMS Inc 1)*	-	0.000	0.000	31.894	0.000	31.894	0.000	0.000	0.000	0.000	0.000	31.894

Note

In FY20, PE 0901554F, DEAMS, changed from PE 0901538F, Financial Management Information Systems Development.
In FY20, Project 675178, DEAMS Continuous Capability Development, changed from Defense Enterprise Accounting Management System Increment 2 (DEAMS Inc. 2).

A. Mission Description and Budget Item Justification

This program element develops upgrades to existing financial management systems. These upgrades are required to comply with auditability and transparency requirements as well as efficiencies in processing financial transactions. This program element also supports studies and analysis to improve future program planning and execution.

There are two projects within this program element: Defense Enterprise Accounting and Management System (DEAMS) Increment 1 (Inc 1), and DEAMS Continuous Capability Development (CCD), formerly known as DEAMS Increment 2. Project 675178: DEAMS Continuous Capability Development (CCD) started in FY19 under PE 0901538F. Project 675179: DEAMS Increment 1 was under PE 0901538F through FY19.

The Defense Enterprise Accounting and Management System (DEAMS) is a commercial-off-the-shelf (COTS), Oracle-based software implementation effort that will provide an auditable, modern accounting and finance system. The DEAMS implementation will replace many existing accounting and finance legacy systems and will provide core funds execution management functions consistent with financial management laws, regulations and policy, general ledger, funds management, payments, receivables, cost and revenues, and fiduciary reporting. DEAMS is compliant with the Clinger-Cohen Act, Business Enterprise Architecture (BEA), and integrates into Global Combat Support System-Air Force (GCSS-AF). DEAMS is a key enabler and provides the core accounting system for all enterprise business system development necessary to sustain financial statement auditability.

DEAMS enhancements will be governed in Capability Support Phase after Increment 1 Full Deployment (FD).

DEAMS is the Air Force's target core accounting and financial management solution and is a key component of the long-term business process improvements needed to sustain auditability and correct financial system weaknesses.

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

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0901554F / *Defense Enterprise Acntng and Mgt Sys (DEAMS)*

This program element may include necessary civilian pay expenses required to manage, execute, and deliver financial management information systems capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	46.789	0.000	46.789
Total Adjustments	0.000	0.000	46.789	0.000	46.789
• 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	46.789	0.000	46.789

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0901554F / *Defense Enterprise Acntng and Mgt Sys (DEAMS)*	Project (Number/Name) 675178 / *DEAMS Continuous Capability Development*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675178: *DEAMS Continuous Capability Development*	-	0.000	0.000	14.895	0.000	14.895	57.016	55.151	50.064	50.965	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY20, PE 0901554F, DEAMS, changed from PE 0901538F, Financial Management Information Systems Development.
In FY20, Project 675178, DEAMS Continuous Capability Development, changed from Defense Enterprise Accounting Management System Increment 2 (DEAMS Inc. 2).

A. Mission Description and Budget Item Justification

Defense Enterprise Accounting and Management System (DEAMS) is a commercial-off-the-shelf (COTS), Oracle-based software implementation effort that will provide an auditable, modern accounting and finance system. DEAMS is a Joint United States Air Force (USAF) and United States Transportation Command (USTRANSCOM) Enterprise Resource Planning (ERP) Program that will replace many existing accounting and finance legacy systems and will provide core funds execution management functions consistent with financial management laws, regulations and policy, general ledger, funds management, payments, receivables, cost and revenues, and fiduciary reporting. DEAMS is compliant with the Clinger-Cohen Act, Business Enterprise Architecture (BEA), and integrates into Global Combat Support System-Air Force (GCSS-AF). When fully deployed, DEAMS will be key to Air Force compliance with the Financial Improvement and Audit Readiness (FIAR) requirement in the 2010 NDAA.

The remaining DEAMS Increment 1 development activities will be completed using agile software development methodologies under a project called DEAMS Rapid Acquisition. In FY19, DEAMS CCD was added to the FY18 NDAA, as a Section 873 Agile Pilot program, Rapid Acquisition will also be a stepping stone in the implementation of agile development methodologies for DEAMS Continuous Capability Development (CCD). Under Rapid Acquisition, the program contracted with a new System Integrator (SI) to sustain the DEAMS R12 baseline, develop the remaining Inc. 1 requirements (disbursing, reporting, Governance/Risk/Compliance (GRC)), and provide continual enhancement and improvement to the deployed system, utilizing agile software development.

DEAMS CCD capabilities will be implemented utilizing an agile software development methodology. Requirements for CCD include, but are not limited to, development of the core accounting and reporting functionality necessary to enable deployment of modernized personnel, contracting, and logistics systems. Additional capabilities under requirements definition include complex acquisition management, reimbursable cost accounting, military entitlement accounting, advanced accounting controls and audit sustainment, treasury cash accountability, and management accounting and billing for revolving funds. Included in these capabilities are selected requirements deferred from Increment 1.

Requirements will be addressed through an iterative process of sprint development cycles, where usable capability is produced after every sprint. The PMO construct along with application of agile principles allows the program to properly plan system requirements, deliver early capability to the end users, achieve early return on investment of taxpayer dollars, division of risk, reduce waste, effectively respond to change, and continuously improve our processes.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901554F / *Defense Enterprise Acntng and Mgt Sys (DEAMS)*	**Project (Number/Name)** 675178 / *DEAMS Continuous Capability Development*

Additional user deployments enabled by future increment capabilities include acquisition program executive offices; ranges, laboratories and test centers; and air logistics centers. CCD adds an additional 4,600 users to Inc 1 baseline for a total of 21,500 users.

This funding request will support development of the Business Capability Acquisition Cycle (BCAC) compliant information artifacts and plans necessary to support the program, Capability Process Maps (CPMs) for each business capability, and mapping of financial management processes the capability will require (Blueprinting). Additionally, the funding will support acquisition strategy planning by early identification/definition of Information Technology Functional Requirements (ITFRs) and Information Assets (IA), Acquisition Strategy Determination, Solution Approach, and Request for Proposal (RFP) preparation.

Funds may be used to develop, acquire, and integrate hardware and software solutions to provide improvements and enhancements in support of the development of the DEAMS capabilities.

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

This program element may include necessary civilian pay expenses required to manage, execute, and deliver financial management information systems capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: DEAMS Continuous Capability Development (CCD) Product Development	0.000	0.000	14.895	0.000	14.895
Description: DEAMS CCD system capabilities will be developed and enhanced through completion of development sprint cycles in accordance with an agile software development strategy. DEAMS expects to leverage lessons learned during the Increment I rapid acquisition to develop a T&E process that is more complimentary to the Agile software development process. Development activities include requirements analysis, design, build, test, data conversion, cut-over from legacy systems, and the resolution of deficiency reports and defects. Also includes the support services (product development support, solution architecture support, configuration control and management support, quality assurance support, acquisition strategy support, test planning support, and cybersecurity support) of various Advisory and Assistance Services (A&ASs), Program Management Administration (PMA) activities, and Federally Funded Research and Development Centers (FFRDCs). ***FY 2019 Plans:*** - Will begin Technical support services for requirements definition and analysis and System Integrator request for proposal (RFP) development - Will begin Acquisition planning and support for CCD system capabilities to include but not limited to:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901554F / *Defense Enterprise Acntng and Mgt Sys (DEAMS)*	**Project (Number/Name)** 675178 / *DEAMS Continuous Capability Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
- Acquisition Contracting Interfaces - Foreign Military Sales (FMS) - Budget Distribution Interface - Conversion interface with System Integrator					
FY 2020 Base Plans: - Continue Technical support services for requirements definition and analysis and System Integrator request for proposal (RFP) development - Continue Acquisition planning and support for first set of agile development epics supporting Continuous Capability Development (CCD) system capabilities to include but not limited to: - Ad Hoc Cost Analysis Reporting - Additional Business Intelligence (BI) functionality - Base Supply Expenditures General Funds only - Accounting for base supply purchases - Treasury Direct Phase 2 & 3 - Implements Treasury Direct collections - Civilian Pay Cost Accounting - Record Civilian Pay detail for accruals and expenditure accounting - Contract Data Standards - Implements Acquisition data standards for contract writing systems - Major Acquisition/Reimbursable Program Systems - Interfaces/Capabilities necessary for major acquisition programs reporting and Complex contract obligation and pre-validation - Job Order Cost Accounting - Interface enhancement of Job Order Cost Accounting System (JOCAS) II with Standard Financial Information Structure (SFIS) upgrade - Initiate test planning for Agile acquisition					
FY 2020 OCO Plans: N/A					
FY 2019 to FY 2020 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901554F / *Defense Enterprise Acntng and Mgt Sys (DEAMS)*	**Project (Number/Name)** 675178 / *DEAMS Continuous Capability Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Funding increases due to PE 0901554F, DEAMS, changing from PE 0901538F, Financial Management Information Systems Development.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	14.895	0.000	14.895

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPAF 03 834470: *Defense Enterprise Accounting & Mgt Sys*	1.000	0.802	1.905	0.000	1.905	0.900	3.107	3.162	3.219	Continuing	Continuing

Remarks

D. Acquisition Strategy

The DEAMS Continuous Capability Development (CCD) acquisition strategy will leverage experience gained from FY19 NDAA Section 869 Pilot Program activities and from agile software development efforts in Increment 1. CCD will be implemented using an agile methodology approach following the Business Capability Acquisition Cycle (BCAC). DEAMS will be in the Capability Sustainment Phase 5 (per DOD Instruction 5000.75) and will conduct continual enhancement/process improvements for the life of the program. DEAMS will continue technical support services for requirements definition and analysis and System Integrator request for proposal (RFP) development, and continue acquisition planning and support for first set of agile development epics supporting CCD system capabilities.

CCD will deliver functionality at earliest opportunity on a stable Increment 1 baseline. User experience and mission impact will be taken into account when establishing the release battle rhythm to the operational system. Factors for software releases include:
- Budget formulation and justification cycles
- End of year financial closeout
- Interdependencies with enterprise business systems
- Higher DOD requirements
- On-going development efforts with LOG-IT, CON-IT, MRO, and AFIPPS
- Interfaces/data standards changes
- Changes to hosting, deployment technologies, or strategies to optimize system security, performance, and cost savings

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901554F / *Defense Enterprise Acntng and Mgt Sys (DEAMS)*	**Project (Number/Name)** 675178 / *DEAMS Continuous Capability Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DEAMS Continuous Capability Development (CCD) Product Development	C/TBD	TBD : TBD	-	-		-		11.941	Apr 2020	-		11.941	Continuing	Continuing	-
		Subtotal	-	-		-		11.941		-		11.941	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Administrative (PMA) Costs	Various	Various : Various	-	-		-		2.954	Oct 2019	-		2.954	Continuing	Continuing	-
		Subtotal	-	-		-		2.954		-		2.954	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		0.000		14.895		-		14.895	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901554F / *Defense Enterprise Acntng and Mgt Sys (DEAMS)*	**Project (Number/Name)** 675178 / *DEAMS Continuous Capability Development*

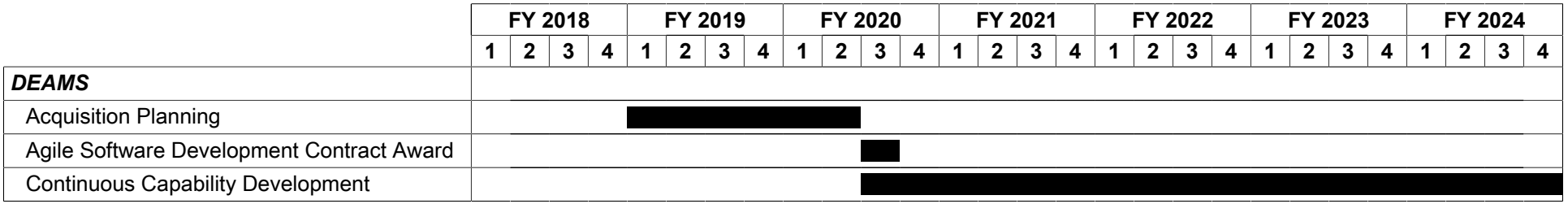

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901554F / *Defense Enterprise Acntng and Mgt Sys (DEAMS)*	**Project (Number/Name)** 675178 / *DEAMS Continuous Capability Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
DEAMS				
Acquisition Planning	1	2019	2	2020
Agile Software Development Contract Award	3	2020	3	2020
Continuous Capability Development	3	2020	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0901554F / *Defense Enterprise Acntng and Mgt Sys (DEAMS)*	Project (Number/Name) 675179 / *Defense Enterprise Accounting Management System Increment 1 (DEAMS Inc 1)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675179: *Defense Enterprise Accounting Management System Increment 1 (DEAMS Inc 1)*	-	0.000	0.000	31.894	0.000	31.894	0.000	0.000	0.000	0.000	0.000	31.894
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY20, PE 0901554F, DEAMS, changed from PE 0901538F, Financial Management Information Systems Development.

A. Mission Description and Budget Item Justification

Defense Enterprise Accounting and Management System (DEAMS) is a commercial-off-the-shelf (COTS), Oracle-based software implementation effort that will provide an auditable, modern accounting and finance system. DEAMS is a Joint United States Air Force (USAF) and United States Transportation Command (USTRANSCOM) Enterprise Resource Planning (ERP) Program that will replace many existing accounting and finance legacy systems and will provide core funds execution management functions consistent with financial management laws, regulations and policy, general ledger, funds management, payments, receivables, cost and revenues, and fiduciary reporting. DEAMS is compliant with the Clinger-Cohen Act, Business Enterprise Architecture (BEA), and integrates into Global Combat Support System-Air Force (GCSS-AF). When fully deployed, DEAMS will be key to Air Force compliance with the Financial Improvement and Audit Readiness (FIAR) requirement in the 2010 NDAA.

DEAMS user deployments include:
- Air Mobility Command (AMC) without Transportation Working Capital Funds (TWCF)
- AMC with TWCF, in conjunction with Defense Finance and Accounting Service (DFAS) Rome
- Air Combat Command (ACC) and Air Force Global Strike Command (AFGSC)
- Air Force Reserve Command (AFRC), and Air National Guard (ANG) and other Geographically Separated Units (GSUs) to include DFAS Limestone, Air Force District of Washington (AFDW), Air Force Special Operations Command (AFSOC), U.S. Air Force Academy (USAFA), Pacific Air Forces (PACAF), and DFAS Japan
- U. S. Air Forces in Europe (USAFE), DFAS Europe, and Air Education and Training Command (AETC), Joint Base San Antonio
- Air Force Material Command (AFMC) and Air Force Space Command (AFSPC) (Incremental Deployments)
- Remaining DFAS locations and all other GSUs

On 23 January 2017, the senior official provided the Critical Change Report (CCR) with certifications to Congress. The report recommended a restructure of DEAMS from one increment to multiple increment. The Milestone Decision Authority (MDA) approved the restructured program for DEAMS Inc 1, to include deferring certain requirements to future increments, a limited deployment to an additional 700 users for Inc 1 to United States Air Force in Europe (USAFE), and the updated Full Deployment Authority to Proceed (FD ATP) criteria via an Acquisition Decision Memorandum (ADM) dated 2 June 2017. (FD ATP date is August 2020 and Capability Support Authority to Proceed (CS ATP) date is February 2021.)

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901554F / *Defense Enterprise Acntng and Mgt Sys (DEAMS)*	**Project (Number/Name)** 675179 / *Defense Enterprise Accounting Management System Increment 1 (DEAMS Inc 1)*

The remaining DEAMS Inc 1 schedule includes the Oracle e-Business Suite R12 upgrade and development and deployment of the remaining Increment 1 capabilities (disbursing, reporting, and Governance/Risk/Compliance (GRC)), as well as enhancements and improvements to the existing baseline. In accordance with the FY19 NDAA, DEAMS is an Agile Pilot program as defined in Sec 873 of the FY18 NDAA, and all remaining development will be accomplished using agile software development methodologies.

DEAMS Inc 1 is developing capability which allows for deployment to the remaining user locations. However, DEAMS has also begun transitioning previously deployed locations to the Operation and Support (O&S) phase.

Funds may be used to develop, acquire, and integrate hardware and software solutions to provide improvements and enhancements in support of the development of the DEAMS capabilities.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver financial management information systems capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Product Development	0.000	0.000	31.304	0.000	31.304
Description: DEAMS Inc 1 capability development activities support multiple software releases and user deployments as described in the mission description. Development activities include design, build, test, data conversion, reporting, cutover from legacy systems, and the resolution of deficiency reports and defects. Activities also include hardware support (system administration and database security) and storage service by Defense Information Systems Agency (DISA); continued development of interface to Global Combat Support System - Air Force (GCSS-AF); Enterprise Resource Planning (ERP) Common Computing Environment (CCE); Independent Verification and Validation (IV&V); Developmental Release Field Support (DRFS) to include process execution and data scripts; help desk support; Engineering Integration Services (EIS) for oversight of development tools and processes; deployment training and change management activities. Provides acquisition, contract, finance, and cost management planning and Program Management Administration (PMA) utilizing an agile approach for reporting, disbursing, and auditing initiatives. Develop, using an Agile software development approach, the Disbursing Initiative (includes modernizing disbursing and implementing daily reconciliation with the U.S. Treasury, which will manage the receipt and acceptance of agreements, orders, and invoices), the Reporting Initiative (establish a modernized Business					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901554F / *Defense Enterprise Acntng and Mgt Sys (DEAMS)*	**Project (Number/Name)** 675179 / *Defense Enterprise Accounting Management System Increment 1 (DEAMS Inc 1)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Intelligence reporting solution), and the Segregation of Duties (SOD) Initiative (allow DEAMS to meet regulatory compliance requirements associated with Financial Information System Controls Audit Manual (FISCAM)). Accomplishments: - As of 9 Aug 2018, 155 of 170 Installations migrated to DEAMS Inc 1 and 14,700 of 16,900 end users migrated to Inc 1 - Successfully deployed to US Air Forces in Europe Major Command - Successful FY18 end of year closeout ***FY 2019 Plans:*** - Continue development and deployment of E-Business Suite (EBS) R12 software - Continue development/integration of DEAMS disbursing initiative, auditing and long term reporting using Agile Software Development - Continue to work DEAMS enhancements and improvements - Continue remaining development activities to develop capability in support of remaining deployments - Continue program office support activities ***FY 2020 Base Plans:*** - Will continue with agile development/integration sprints of DEAMS disbursing initiative, auditing and long term reporting using Agile Software Development - Will continue to work DEAMS enhancements and improvements using Agile Software Development - Will continue remaining development activities to develop capability in support of remaining deployments using Agile Software Development - Will continue program office support activities ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding increases due to PE 0901554F, DEAMS, changing from PE 0901538F, Financial Management Information Systems Development.					
Title: Test and Evaluation (T&E)	0.000	0.000	0.590	0.000	0.590

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901554F / *Defense Enterprise Acntng and Mgt Sys (DEAMS)*	**Project (Number/Name)** 675179 / *Defense Enterprise Accounting Management System Increment 1 (DEAMS Inc 1)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Description: The T&E process will be a complete system operational test to determine DEAMS effectiveness, suitability, and mission capability using the R12 Upgrade. It begins with validation of requirements and end to end functional capabilities including compliance mandates. The T&E effort are conducted in developer sites, Air Force test sites, DISA production sites, and user locations. The DEAMS Test and Evaluation Master Plan (TEMP), Lead Developmental Test Organization (LDTO) Integrated Test Plan (ITP), System Integrators (SIs) Software Test Plans (STPs), and Operational Test Agency (OTA) operational test plans covers the details of Increment 1 T&E. Database Administrator (DBA) Test Support required to service test instances. Capabilities Integration Environment (CIE) Integration/Development support for ancillary Test activities required. Hardware and software required for test activities. The T&E effort for the Agile Pilot Program includes Sprint Testing where functionality developed code in the sprint is tested for conformance to functional and non-functional requirements. Sprint Testing shall address unit and integrated testing. Additionally, there will be Regression Testing to validate that the work within the sprint has not introduced defects into areas of the product not directly impacted by the work of the sprint and has not introduced defects into cross-product dependencies such as interfaces. ***FY 2019 Plans:*** - Continue validation of software and hardware releases and other system updates for DEAMS Inc1 - Continue scheduled test events to add confidence to the revised schedule, and DEAMS critical change - Continue preparations for and begin Follow-on Operational Test and Evaluation (FOT&E) - Continue development/integration of DEAMS disbursing initiative and other system capabilities ***FY 2020 Base Plans:*** - Complete Follow-on Operational Test and Evaluation (FOT&E) - Continue development/integration of DEAMS disbursing initiative and other system capabilities - Will continue to validate planned software releases and coordinate the complete testing of the Oracle R12 technical software upgrade - Will continue to validate user deployments and coordinate testing - Will continue to plan for and start execution of FOT&E ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:***					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901554F / *Defense Enterprise Acntng and Mgt Sys (DEAMS)*	**Project (Number/Name)** 675179 / *Defense Enterprise Accounting Management System Increment 1 (DEAMS Inc 1)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Funding increases due to PE 0901554F, DEAMS, changing from PE 0901538F, Financial Management Information Systems Development.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	31.894	0.000	31.894

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPAF 03 834470: *Defense Enterprise Accounting & Mgt Sys*	1.000	0.802	1.905	0.000	1.905	0.900	3.107	3.162	3.219	Continuing	Continuing

Remarks

D. Acquisition Strategy

DEAMS Inc 1 is over 87% deployed as the baseline viable product for the AF operational finance community. The program relies on heavy customer involvement through the functional management office to govern system changes, requirements development, and day-to-day customer support. DEAMS will employ multiple contract actions as the various Development Activities and Releases are developed, tested, and deployed through FY20.

DEAMS Inc 1 accelerated deployment to Air Combat Command (ACC), Air Education & Training Command (AETC), and AF Reserve Command (AFRC) tenant users from FY20 to FY19. This user base was orphaned from ACC, AETC, and AFRC only because they reside on bases owned by other Major Commands.

AF Space Command and AF Materiel Command Incremental users at the base operations level will migrate to DEAMS Inc 1 capability in FY20 as planned.

In the FY19 NDAA, DEAMS was nominated to be an FY18 NDAA Sec 873 Agile Pilot program. To facilitate the transition from traditional to agile software development, Increment 1 development items will be completed under a new rapid acquisition contract action using agile software development methods. This new effort will also inform and facilitate the agile program implementation for DEAMS Continuous Capability Development.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901554F / *Defense Enterprise Acntng and Mgt Sys (DEAMS)*	**Project (Number/Name)** 675179 / *Defense Enterprise Accounting Management System Increment 1 (DEAMS Inc 1)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DEAMS: Rapid Acquisition	C/T&M	CACI-ISS, INC : Chantilly, VA	-	-		-		8.201	Feb 2020	-		8.201	0.000	8.201	-
DEAMS: SME Support, General Ledger Reports and Analysis, Business Process Analysis, Master Data Conversion and Training Development	C/T&M	Kearney and Company : Various	-	-		-		10.000		-		10.000	Continuing	Continuing	-
DEAMS: ERP Solutions Architecture services	C/FP	Lintech Global, Inc. : Farmington Hills, MI	-	-		-		3.500	Feb 2020	-		3.500	0.000	3.500	-
DEAMS: Oracle Software Solutions	Various	Various : Various	-	-		-		0.500	May 2020	-		0.500	0.000	0.500	-
DEAMS: ETASS (Engineering)	C/CPFF	Jacobs Technology : Dayton, OH	-	-		-		2.670	Feb 2020	-		2.670	0.000	2.670	-
DEAMS: FFRDC ERP Engineering	C/Various	MITRE Corporation : Various	-	-		-		0.900	Oct 2019	-		0.900	0.000	0.900	-
DEAMS: Direct mission Support (Development/ Integration Environments)	Various	Various : Various	-	-		-		2.000	Oct 2019	-		2.000	0.000	2.000	-
DEAMS: Computing and storage support, system administration, security, storage, etc.	MIPR	DISA : Various	-	-		-		0.033	Oct 2019	-		0.033	0.000	0.033	-
DEAMS: ERP DBA Development and Support Services	C/FFP	DDC IT Services, LLC : Albuquerque, NM	-	-		-		2.000	Jun 2020	-		2.000	0.000	2.000	-
		Subtotal	-	-		-		29.804		-		29.804	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901554F / *Defense Enterprise Acntng and Mgt Sys (DEAMS)*	**Project (Number/Name)** 675179 / *Defense Enterprise Accounting Management System Increment 1 (DEAMS Inc 1)*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DEAMS: Test services from AFOTEC, JITC, LDTO and other miscellaneous test resources	Various	Various : Various	-	-		-		0.590	Oct 2019	-		0.590	0.000	0.590	-
		Subtotal	-	-		-		0.590		-		0.590	0.000	0.590	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DEAMS Program Management Administration	Various	AFLCMC : WPAFB, OH	-	-		-		1.500	Oct 2019	-		1.500	0.000	1.500	-
		Subtotal	-	-		-		1.500		-		1.500	0.000	1.500	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		0.000		31.894		-		31.894	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901554F / *Defense Enterprise Acntng and Mgt Sys (DEAMS)*	**Project (Number/Name)** 675179 / *Defense Enterprise Accounting Management System Increment 1 (DEAMS Inc 1)*

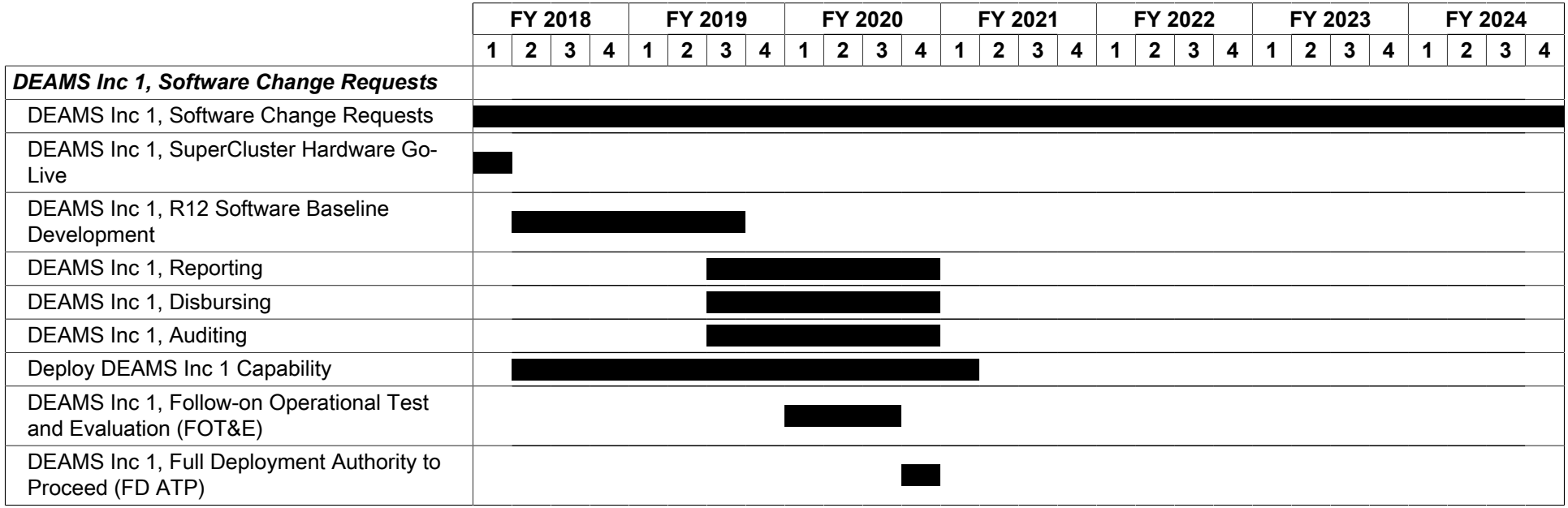

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0901554F / *Defense Enterprise Acntng and Mgt Sys (DEAMS)*	**Project (Number/Name)** 675179 / *Defense Enterprise Accounting Management System Increment 1 (DEAMS Inc 1)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
DEAMS Inc 1, Software Change Requests				
DEAMS Inc 1, Software Change Requests	1	2018	4	2024
DEAMS Inc 1, SuperCluster Hardware Go-Live	1	2018	1	2018
DEAMS Inc 1, R12 Software Baseline Development	2	2018	3	2019
DEAMS Inc 1, Reporting	3	2019	4	2020
DEAMS Inc 1, Disbursing	3	2019	4	2020
DEAMS Inc 1, Auditing	3	2019	4	2020
Deploy DEAMS Inc 1 Capability	2	2018	1	2021
DEAMS Inc 1, Follow-on Operational Test and Evaluation (FOT&E)	1	2020	3	2020
DEAMS Inc 1, Full Deployment Authority to Proceed (FD ATP)	4	2020	4	2020

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1201017F / *Global Sensor Integrated on Network (GSIN)*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	3.647	0.000	3.647	3.709	0.000	0.000	0.000	0.000	7.356
675368: *GSIN (Global Integrated Sensor Network)*	-	0.000	0.000	3.647	0.000	3.647	3.709	0.000	0.000	0.000	0.000	7.356
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2020, PE 0301017F, Global Sensor Integrated on Network (GSIN), Project 675368, GSIN (Global Integrated Sensor Network), efforts were transferred to PE 1201017F, Global Sensor Integrated on Network (GSIN), Project Project 675368, GSIN (Global Integrated Sensor Network), for more accurate classification of work.

A. Mission Description and Budget Item Justification

The mission of USSTRATCOM is to establish and provide full-spectrum, global strike, coordinated space and information operations capabilities to meet both deterrent and decisive national security objectives and to provide operational space support, integrated missile defense, Global Command Control, Communications, and Computers Intelligence Surveillance and Reconnaissance (C4ISR), and specialized planning expertise to the joint warfighter.

The Nation's strategic C2 sensors, and mission planning programs cannot rapidly exchange information across multiple missions creating ambiguity that delays time critical national C2 decision making processes. GSIN developed and established a unified schema that integrates disparate Missile Warning/Missile Defense (MW/MD) data into a single exposed data set providing redundant and unambiguous MW/MD data to national leadership. GSIN also enables existing radars and sensors to provide data in net-centric formats consumable by other authorized systems and mission areas, thus reducing the need to acquire more systems. Activities also include studies and analysis to support both current program planning, execution, and future program planning.

GSIN directly supports USSTRATCOM and other COCOMs and MAJCOM mission sets. GSIN meshes together selected systems and sensors (from tactical to strategic), including the Nation's most modern and capable assets, taking advantage of their larger numbers, improved algorithms, mobility, and forward deployment to provide earlier cross-cueing and expanded decision space when every second counts. Repurposing these traditionally stove-piped systems and sensors, GSIN enables the warfighter in several ways. GSIN enables creation of a User Defined Operating Picture (UDOP) to provide a single, unambiguous missile event picture allowing realtime collaboration for nuclear C2 and improved senior leader situational awareness (SA) for effective decision-making. GSIN also improves Space Situational Awareness (SSA) by tapping additional sensor capability and provides this data for the larger space order of battle capabilities. GSIN dramatically improves the ingestion of nontraditional, but readily available, non-US government and commercial data to the Air Force Space Command (AFSPC) catalog managed by the 18SPCC at Vandenberg AFB. GSIN addresses NORTHCOM/STRATCOM's signed Joint Emergent Operational Need (JEON) ST-0010 request for uninterrupted traditional and non-traditional sensor data integration and the Global Threat Characterization Assessment (GTCA) Operational Planning Team report. GSIN provides critical and unique data to the large AFSPC SSA data repositories to facilitate the large Space Battle Management Command and Control (BMC2) suite of capabilities/programs. Finally, GSIN provides Machine Learner and Data Analysis functions to optimize and operate situational awareness in the field.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1201017F / *Global Sensor Integrated on Network (GSIN)*

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

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	3.647	0.000	3.647
Total Adjustments	0.000	0.000	3.647	0.000	3.647
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	3.647	0.000	3.647

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Radar, sensor, technical intelligence (TI), and Allied Systems	0.000	0.000	2.200
Description: Radar, sensor, technical intelligence and Allied Systems: Designs, develops, exposes and integrates data from radar, sensors and technical intelligence systems in regions of the world where potential GSIN users currently do not have coverage. Provide real time data from systems that previously reported in hours or days after critical events. Conduct studies/ surveys/meetings as necessary to continually identify systems meeting GSIN user data exposure needs. Space Situational Awareness (SSA): Designs, develops, tests, exposes, and integrates SSA data from previously untapped systems into space production systems and the Global Information Grid (GIG). Develop implementation plans to mature data exposure capabilities.			
FY 2019 Plans:			

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1201017F / *Global Sensor Integrated on Network (GSIN)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
N/A ***FY 2020 Plans:*** - Begin Implementing Strategic Study - Complete deployment and testing of Radar/Sensor/TI Project 4 and transition to PoR - Identify and begin development of Radar/Sensor/TI Project 5. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Efforts transferred from PE 0301017F to this PE in FY2020.			
Title: Data Services, Net Centric Integration and Configuration Control, and program outreach ***Description:*** Develop common XML net-enabled data schemas and configuration management processes and procedures for Missile Warning, Missile Defense, Space, MASINT/Technical Intelligence, and Sensor data to manage the XML schema and associated XML messaging and services. Develop technical outreach for potential new GSIN data consumers and providers who require GSIN sensor data. Upgrade GSIN capabilities as DISA Enterprise Services evolve. Continue modifications to data services. Support integration of GSIN sensor data into appropriate registries/catalogs. Continue development of GSIN data services to enable visualization in a common operating picture. Conduct studies and demonstrations of SSA capabilities, data correlation, and assessment services for risk reduction evaluations. ***FY 2019 Plans:*** N/A ***FY 2020 Plans:*** - Continue developing plans to address NORTHCOM/USSTRATCOM JEON GTCA. Advocate and secure additional RDT&E funding if necessary. - Begin development of a record capability of GSIN exposed data and play it back in real time through a visualization tool. - Continue developing and releasing periodic configuration control processes. - Continue technical outreach processes for new GSIN data consumers and providers. - Deliver new GSIN capabilities to match evolving DISA Enterprise Service updates. - Continue development of new and improved data services. -- Complete deployment and integration of Radar/Sensor/TI Project 4 into DISA Enterprise Services. -- Begin development and integration of Radar/Sensor/TI Project 5 into DISA Enterprise Services. -- Begin development and integration of Radar/Sensor/TI Project 6 into DISA Enterprise Services. ***FY 2019 to FY 2020 Increase/Decrease Statement:***	0.000	0.000	1.447

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1201017F / *Global Sensor Integrated on Network (GSIN)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Efforts transferred from PE 0301017F to this PE in FY2020.			
Accomplishments/Planned Programs Subtotals	0.000	0.000	3.647

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

GSIN uses existing government contract vehicles,from agencies such as Missile Defense Agency (MDA) or Air Force Life Cycle Management Center (AFLCMC), to develop and modernize the combined SSA/MW/MD/MASINT/TI data exposure architecture and solution. The contracts are managed by the relevant organizations contracting office. GSIN does not award or manage any contracts. The AFLCMC at Hanscom AFB, (AFLCMC/HB) provides necessary program management, financial management, and other support as may be applicable for GSIN.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1201017F / *Global Sensor Integrated on Network (GSIN)*	Project (Number/Name) 675368 / *GSIN (Global Integrated Sensor Network)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GSIN Space Situational Awareness Data Exposure - Radar/Sensor/TI Project 5	C/CPAF	Raytheon : Colorado Springs, CO : TBD	-	-		-		1.417	Jan 2020	-		1.417	Continuing	Continuing	-
GSIN Space Situational Awareness Data Exposure - Radar/Sensor/TI Project 6	TBD	Raytheon : Boston, MA : TBD	-	-		-		1.200	Jan 2020	-		1.200	Continuing	Continuing	-
Strategic Study	C/CPAF	KBR Wyle : Omaha, ND : TBD	-	-		-		0.500	Nov 2019	-		0.500	Continuing	Continuing	-
		Subtotal	-	-		-		3.117		-		3.117	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GSIN Program Management Administration	C/FFP	Various : Omaha, NE : TBD	-	-		-		0.530	Oct 2019	-		0.530	Continuing	Continuing	-
		Subtotal	-	-		-		0.530		-		0.530	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		0.000		3.647		-		3.647	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1201017F / *Global Sensor Integrated on Network (GSIN)*	**Project (Number/Name)** 675368 / *GSIN (Global Integrated Sensor Network)*

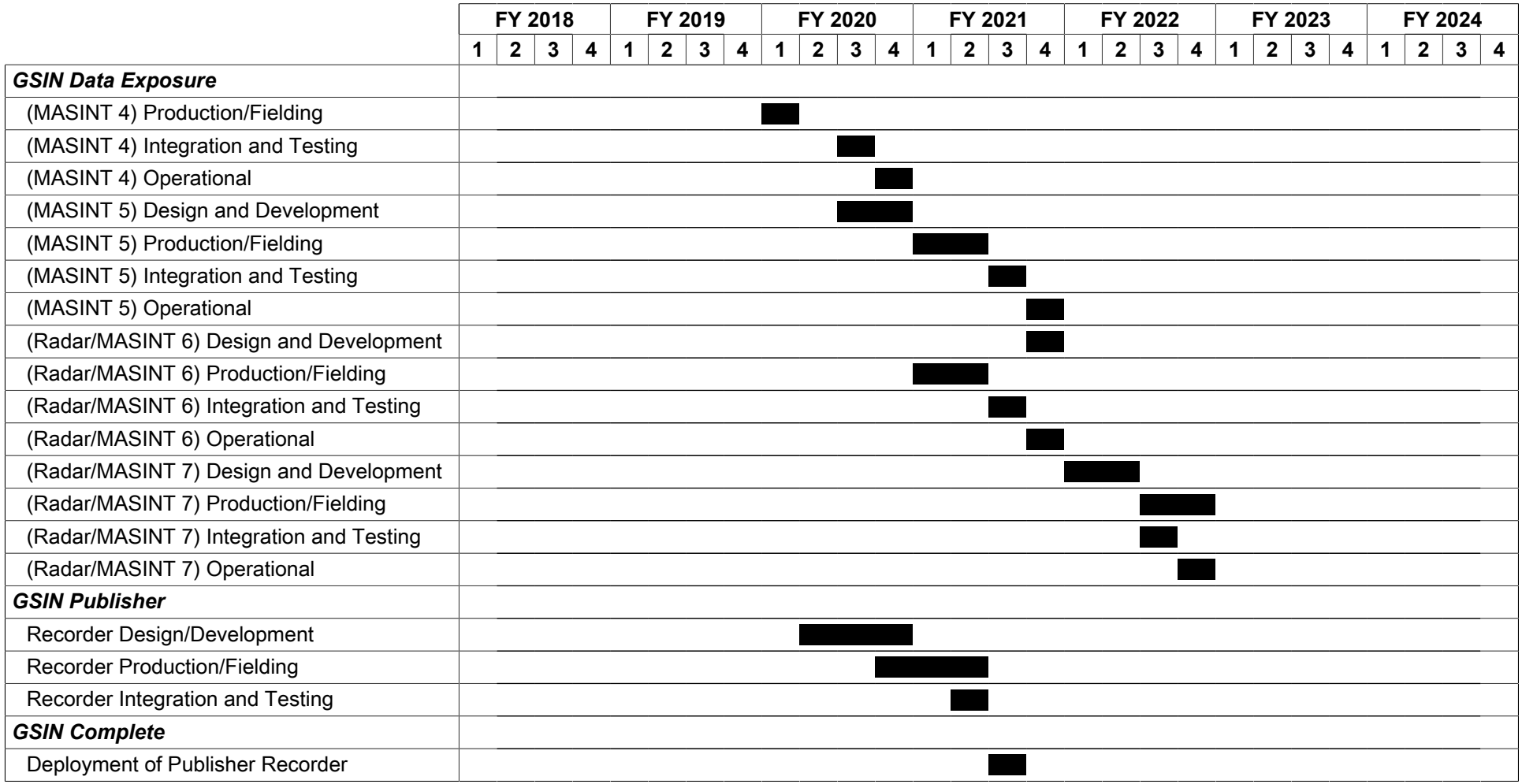

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1201017F / *Global Sensor Integrated on Network (GSIN)*	**Project (Number/Name)** 675368 / *GSIN (Global Integrated Sensor Network)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
GSIN Data Exposure				
(MASINT 4) Production/Fielding	1	2020	1	2020
(MASINT 4) Integration and Testing	3	2020	3	2020
(MASINT 4) Operational	4	2020	4	2020
(MASINT 5) Design and Development	3	2020	4	2020
(MASINT 5) Production/Fielding	1	2021	2	2021
(MASINT 5) Integration and Testing	3	2021	3	2021
(MASINT 5) Operational	4	2021	4	2021
(Radar/MASINT 6) Design and Development	4	2021	4	2021
(Radar/MASINT 6) Production/Fielding	1	2021	2	2021
(Radar/MASINT 6) Integration and Testing	3	2021	3	2021
(Radar/MASINT 6) Operational	4	2021	4	2021
(Radar/MASINT 7) Design and Development	1	2022	2	2022
(Radar/MASINT 7) Production/Fielding	3	2022	4	2022
(Radar/MASINT 7) Integration and Testing	3	2022	3	2022
(Radar/MASINT 7) Operational	4	2022	4	2022
GSIN Publisher				
Recorder Design/Development	2	2020	4	2020
Recorder Production/Fielding	4	2020	2	2021
Recorder Integration and Testing	2	2021	2	2021
GSIN Complete				
Deployment of Publisher Recorder	3	2021	3	2021

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1201921F / *Service Support to STRATCOM - Space Activities*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	13.769	14.161	0.988	0.000	0.988	0.996	1.006	1.015	1.024	Continuing	Continuing
670373: *DCIP*	-	0.475	0.487	0.488	0.000	0.488	0.496	0.506	0.515	0.524	Continuing	Continuing
672486: *JOINT NAVWAR CENTER (JNWC) SPACE ACTIVITIES*	-	7.199	7.427	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
67A011: *Space Analysis and Application Development*	-	6.095	6.247	0.500	0.000	0.500	0.500	0.500	0.500	0.500	Continuing	Continuing

Note

Prior to the FY20 PB cycle, The Space Analysis and Application Development Program (WSC 67A011), the Joint Navigation and Warfare Center (WSC 672486), along with the Data Integration and Fusion Center (WSC 67A011), and the Defense Critical Infrastructure Program (WSC 670373) funding were all reported under PE 1201921F. Beginning in FY20, the Space Analysis and Application Development program and the Joint Navigation Warfare Center will be reported under the newly created PE 1202140F, USSPACECOM. Leaving only the Data Integration and Fusion Center and the Defense Critical Infrastructure Program being reported under PE 1201921F.

A. Mission Description and Budget Item Justification

The USSTRATCOM Data Integration and Fusion Center (DIFC) is an innovative organization developing and experimenting innovative concepts designed to validate both material and non-material methodologies to overcome data isolation in order to enable kill chains in the Joint Battlespace. Funds are necessary to update current government-owned software to ingest and disseminate new data sources from Title 10 and Title 50 sensors. The DIFC efforts at COCOM sponsored experimentation events will inform service acquisition decisions, capability gaps, intelligence gaps and tactics, techniques and procedures (TTP) development and implementation to mitigate effects on warfighter operations.

The USSTRATCOM Defense Critical Infrastructure Protection program (DCIP) is a risk management program that seeks to ensure the availability of networked assets critical to USSTRATCOM and other DoD missions. Critical infrastructure assets can include installations, facilities, antennas, vehicles, computing systems, and communications links. DCIP is directed by the Office of the Assistant Secretary of Defense (Homeland Defense & Americas' Security Affairs) [OASD (HD&ASA)]. DCIP manages the identification, prioritization, assessment, and assurance of Critical Infrastructure as a comprehensive program that includes the development of adaptive plans and procedures to mitigate risk, restore capability in the event of loss or degradation, support incident management, and protect defense critical infrastructure.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1201921F / *Service Support to STRATCOM - Space Activities*

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	14.255	14.161	15.001	0.000	15.001
Current President's Budget	13.769	14.161	0.988	0.000	0.988
Total Adjustments	-0.486	0.000	-14.013	0.000	-14.013
• 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	-0.486	0.000	-14.013	0.000	-14.013

Change Summary Explanation

In FY20 the decrease is associated with the funding for the Joint Navigation Warfare Center, and the USSTRATCOM Space Modeling and Simulation moving into the newly created USSPACECOM PE 1202140F. The only RDT&E funding remaining in 1201921F will be for the Data Integration and Fusion Center (~$500K per year) and the Defense Critical Infrastructure Program (DCIP) ($488K in FY20).

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1201921F / *Service Support to STRATCOM - Space Activities*	Project (Number/Name) 670373 / *DCIP*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
670373: *DCIP*	-	0.475	0.487	0.488	0.000	0.488	0.496	0.506	0.515	0.524	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

An October 2014 memorandum of agreement between USSTRATCOM and Deputy Assistant Secretary of Defense for Defense Continuity and Mission Assurance transferred budget authority for DCIP funding to USSTRATCOM beginning in FY16. THIS IS NOT A NEW START.

A. Mission Description and Budget Item Justification

The USSTRATCOM Defense Critical Infrastructure Protection program (DCIP) is a risk management program that seeks to ensure the availability of networked assets critical to USSTRATCOM and other DoD missions. Critical infrastructure assets can include installations, facilities, antennas, vehicles, computing systems, and communications links. DCIP is directed by the Office of the Assistant Secretary of Defense (Homeland Defense & Americas' Security Affairs) [OASD (HD&ASA)]. DCIP manages the identification, prioritization, assessment, and assurance of Critical Infrastructure as a comprehensive program that includes the development of adaptive plans and procedures to mitigate risk, restore capability in the event of loss or degradation, support incident management, and protect defense critical infrastructure.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Defense Critical Infrastructure Program	0.475	0.487	0.488	-	0.488
Description: The USSTRATCOM Defense Critical Infrastructure Protection program (DCIP) is a risk management program that seeks to ensure the availability of networked assets critical to USSTRATCOM and other DoD missions. Critical infrastructure assets can include installations, facilities, antennas, vehicles, computing systems, and communications links. DCIP is directed by the Office of the Assistant Secretary of Defense (Homeland Defense & Americas' Security Affairs) [OASD (HD&ASA)]. DCIP manages the identification, prioritization, assessment, and assurance of Critical Infrastructure as a comprehensive program that includes the development of adaptive plans and procedures to mitigate risk, restore capability in the event of loss or degradation, support incident management, and protect defense critical infrastructure. ***FY 2019 Plans:*** Continued support of analysis, studies and research of critical infrastructure assets and dependencies supporting all USSTRATCOM assigned missions, to include focusing efforts of future critical infrastructure vulnerability assessments and researching the various sources to perform threats and hazards assessments.					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1201921F / *Service Support to STRATCOM - Space Activities*	**Project (Number/Name)** 670373 / *DCIP*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
No OCO requested ***FY 2020 Base Plans:*** DCIP will continue to support of analysis, studies and research of critical infrastructure assets and dependencies supporting all USSTRATCOM assigned missions, to include focusing efforts of future critical infrastructure vulnerability assessments and researching the various sources to perform threats and hazards assessments. No OCO requested ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY19 to FY20 increase is due to inflation					
Accomplishments/Planned Programs Subtotals	0.475	0.487	0.488	-	0.488

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

The Defense Critical Infrastructure Program is an on-going program, cost to complete is N/A

D. Acquisition Strategy

Projects funded through DCIP will be awarded using competitive contracts to the maximum extent possible.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1201921F / *Service Support to STRATCOM - Space Activities*	**Project (Number/Name)** 670373 / *DCIP*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Asset Dependency and Risk Characterization Research	C/Various	TBD : TBD	-	0.475	Jan 2018	0.487	Jan 2019	0.488	Jan 2020	0.000		0.488	Continuing	Continuing	-
		Subtotal	-	0.475		0.487		0.488		0.000		0.488	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.475		0.487		0.488		0.000		0.488	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1201921F / *Service Support to STRATCOM - Space Activities*	**Project (Number/Name)** 670373 / *DCIP*

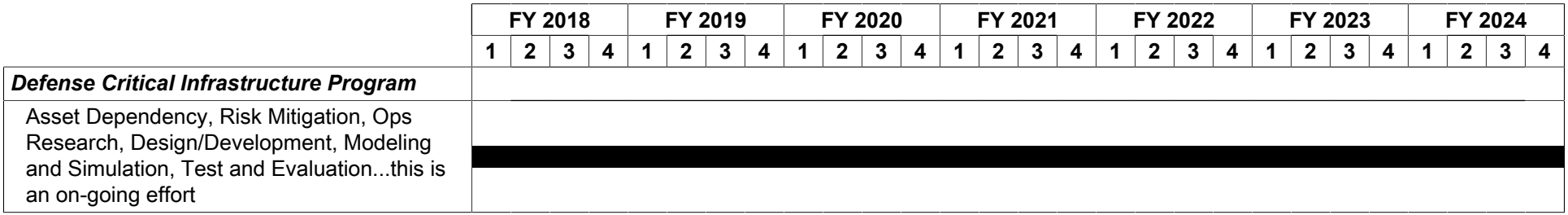

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1201921F / *Service Support to STRATCOM - Space Activities*	**Project (Number/Name)** 670373 / *DCIP*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Defense Critical Infrastructure Program				
Asset Dependency, Risk Mitigation, Ops Research, Design/Development, Modeling and Simulation, Test and Evaluation...this is an on-going effort	1	2018	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1201921F / *Service Support to STRATCOM - Space Activities*	Project (Number/Name) 672486 / *JOINT NAVWAR CENTER (JNWC) SPACE ACTIVITIES*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
672486: *JOINT NAVWAR CENTER (JNWC) SPACE ACTIVITIES*	-	7.199	7.427	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Beginning in FY20 all funding moved to PE 1202140F - USSPACECOM PE

A. Mission Description and Budget Item Justification

Navigation Warfare (Navwar) is deliberate defensive and offensive action to assure positioning, navigation, and timing (PNT) information through coordinated employment of space, cyberspace, and electronic warfare (EW) operations. Funds are used to create and maintain NAVWAR knowledge. Navwar expertise is developed in part by execution of PNT Operational Field Assessments (POFAs). GYPSY POFA's are linked to Combatant Commander's (CCMD) Tier 1 exercises and provide operational realistic threat-representative, GPS-contested environments for analytical assessment of air, ground, maritime, space & cyberspace mission capability. MODORD to OPERATION OLYMPIC DEFENDER calls for the execution of GPS-contested environments as part of the Joint Combat Capability in Contested Environment Assessments (JC3EA). FORTUNE POFAs are PNT capability and vulnerability assessments associated with a Service exercise or mission event. PRISM POFAs encompass all Operations, Actions, and Activities (OAAs) associated with events outside of specific CCMD and/or service exercises or mission events. Assessments inform service acquisition decisions, capability gaps, intelligence gaps and tactics, techniques and procedures (TTP) development and implementation to mitigate effects on warfighter operations in the anticipated theater Navwar threat environments. JNWC assesses Department wide PNT posture through the PNT Annual assessment IAW DoDI 4650.08.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: PNT Operational Field Assessments	7.199	7.427	0.000	0.000	0.000
Description: The JNWC will investigate, operationally assess, and simulate potential threats and mitigation strategies for denial of blue force PNT capabilities as well as preventing the hostile use of PNT information. Major Performers - Best value to the government selected contractors, universities, government facilities, federally funded research and development centers, laboratories, or other organizations					
FY 2019 Plans: Operational assessments - Simulate potential threats and mitigation strategies for potential denial of blue force PNT capabilities - Continuing development to prevent the hostile use of Positioning, Navigation and Timing (PNT) information.					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1201921F / *Service Support to STRATCOM - Space Activities*	**Project (Number/Name)** 672486 / *JOINT NAVWAR CENTER (JNWC) SPACE ACTIVITIES*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
No OCO requested ***FY 2020 Base Plans:*** Continuing Operational assessments - Simulate potential threats and mitigation strategies for potential denial of blue force PNT capabilities - Continuing development to prevent the hostile use of Positioning, Navigation and Timing (PNT) information. ***FY 2020 OCO Plans:*** No OCO Requested ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY19 to FY20 increase is due to inflation. FY18 PDM plussed up JNWC RDT&E to current level.					
Accomplishments/Planned Programs Subtotals	7.199	7.427	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Beginning in FY20, the program will be reported under the newly created PE 1202140F, USSPACECOM

D. Acquisition Strategy

New contracts will be awarded using competitive procedures to the maximum extent possible.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1201921F / *Service Support to STRATCOM - Space Activities*	**Project (Number/Name)** 672486 / *JOINT NAVWAR CENTER (JNWC) SPACE ACTIVITIES*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PNT Operational Field Assessments	PO	Multiple : Kirtland AFB, NM	-	7.199	Oct 2017	7.427	Oct 2018	0.000		0.000		0.000	Continuing	Continuing	-
		Subtotal	-	7.199		7.427		0.000		0.000		0.000	Continuing	Continuing	N/A

Remarks

Beginning in FY 2018 the JNWC portfolio transferred out of PE 15921F in to PE 120921F.

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	7.199		7.427		0.000		0.000		0.000	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1201921F / *Service Support to STRATCOM - Space Activities*	**Project (Number/Name)** 672486 / *JOINT NAVWAR CENTER (JNWC) SPACE ACTIVITIES*

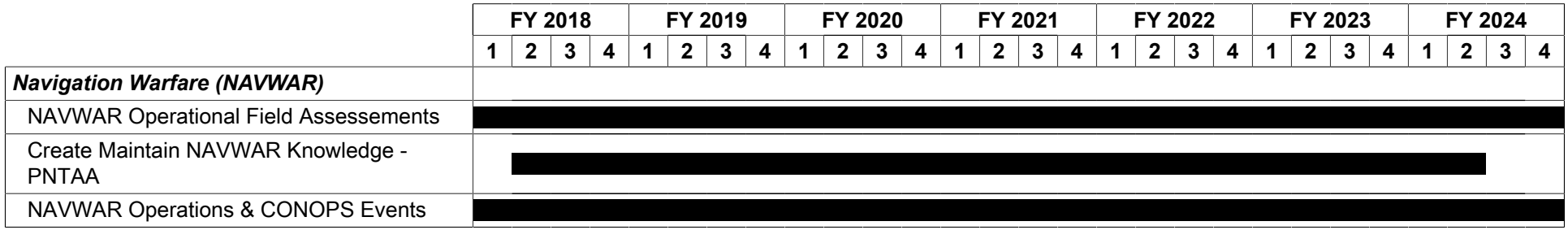

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1201921F / *Service Support to STRATCOM - Space Activities*	**Project (Number/Name)** 672486 / *JOINT NAVWAR CENTER (JNWC) SPACE ACTIVITIES*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Navigation Warfare (NAVWAR)				
NAVWAR Operational Field Assessements	1	2018	4	2024
Create Maintain NAVWAR Knowledge - PNTAA	2	2018	2	2024
NAVWAR Operations & CONOPS Events	1	2018	4	2024

Note

Joint Navigation Warfare Center (JNWC) conducts PRISM, FORTUNE, and GYPSY operational field assessments on an on-going, annual basis.

PRISM events encompass all Operations, Actions, and Activities (OAAs) associated with events outside of specific Combatant Command and/or Service exercise or mission event.

FORTUNE events are Positioning, Navigation, and Timing (PNT) vulnerability field assessments and are small scale technical risk assessments or can be risk reduction events for larger GYPSY events.

GYPSY events are larger than FORTUNE PNT related events and involve other coalition partners, and multiple US services in direct support of Geographic Combatant Command requirements.

JNWC uses the Major Range and Test Facility Base (MRTFB) program, administered by USD (AT&L). Requirements dictate which MRTFB facility will be contracted to host a GYPSY or FORTUNE event.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1201921F / *Service Support to STRATCOM - Space Activities*	Project (Number/Name) 67A011 / *Space Analysis and Application Development*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
67A011: *Space Analysis and Application Development*	-	6.095	6.247	0.500	0.000	0.500	0.500	0.500	0.500	0.500	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Prior to the FY20 PB cycle, The Space Analysis and Application Development Program was reported under PE 1201921F, WSC 67A011. Beginning in FY20, the program will be reported under the newly created PE 1202140F, USSPACECOM. Leaving only the Data Integration and Fusion Center being reported in WSC/BPAC 67A011, PE 1201921F

A. Mission Description and Budget Item Justification

The USSTRATCOM Data Integration and Fusion Center (DIFC) is an innovative organization developing and experimenting innovative concepts designed to validate both material and non-material methodologies to overcome data isolation in order to enable kill chains in the Joint Battlespace. Funds are necessary to update current government-owned software to ingest and disseminate new data sources from Title 10 and Title 50 sensors. The DIFC efforts at COCOM sponsored experimentation events will inform service acquisition decisions, capability gaps, intelligence gaps and tactics, techniques and procedures (TTP) development and implementation to mitigate effects on warfighter operations.

The Space Analysis and Application Development program Integrates space based effects into Department's 'Model of Record' for joint campaign analysis. Current modeling and simulation (M&S) models are inadequate to represent the contribution that U.S space capabilities make to the air, sea, and land fight and do not accurately portray current and future space threats. This line of effort integrates effects of space capabilities into the Synthetic Theater Operations Research Model (STORM) and other mission and campaign-level M&S tools. Enhanced space M&S will enable the DoD to make informed decisions regarding the direction of U.S. Space Doctrine, Tactics, Techniques, Procedures, and Resource Decisions. The DoD requires the ability to conduct campaign-level analysis to quantify the holistic operational impacts of adversary space actions on military campaigns and U.S. global operations.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Data Integration and Fusion Center	0.818	0.800	0.500	0.000	0.500
Description: USSTRATCOM/J8 Data Integration and Fusion Center (DIFC) is an innovative organization developing and experimenting innovative concepts designed to validate both material and non-material methodologies to overcome data isolation in order to enable kill chains in the Joint Battlespace. The DIFC will work to update current government-owned software to ingest and disseminate new data sources from Title 10 and Title 50 sensors. The DIFC efforts at COCOM sponsored experimentation events will inform					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1201921F / *Service Support to STRATCOM - Space Activities*	**Project (Number/Name)** 67A011 / *Space Analysis and Application Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
service acquisition decisions, capability gaps, intelligence gaps and tactics, techniques and procedures (TTP) development and implementation to mitigate effects on warfighter operations. ***FY 2019 Plans:*** The DIFC continues to investigate, experiment, and disseminate various Title 10 and Title 50 data sources from collection through dissemination to tactical platforms using machine to machine solutions to move data more efficiently and affect kill chain timelines. ***FY 2020 Base Plans:*** The DIFC will continue to investigate, experiment, and disseminate various Title 10 and Title 50 data sources from collection through dissemination to tactical platforms using machine to machine solutions to move data more efficiently and affect kill chain timelines. ***FY 2020 OCO Plans:*** No OCO Requested ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY17 RMD 700A1 programmed funding decrease between years FY19 and FY20 from $800K in FY19 to $500K in FY20 and out.					
Title: Space Analysis and Application Development	5.277	5.447	0.000	0.000	0.000
Description: The Space Analysis and Application Development program Integrates space based effects into Department's 'Model of Record' for joint campaign analysis. Current modeling and simulation (M&S) models are inadequate to represent the contribution that U.S space capabilities make to the air, sea, and land fight and do not accurately portray current and future space threats. This line of effort integrates effects of space capabilities into the Synthetic Theater Operations Research Model (STORM) and other mission and campaign-level M&S tools. Enhanced space M&S will enable the DoD to make informed decisions regarding the direction of U.S. Space Doctrine, Tactics, Techniques, Procedures, and Resource Decisions. The DoD requires the ability to conduct campaign-level analysis to quantify the holistic operational impacts of adversary space actions on military campaigns and U.S. global operations. ***FY 2019 Plans:*** - Conduct mission-level modeling and analysis to quantify the effects of US and adversary space interactions, with focus on six of the Joint Mission Threads (JMTs) developed in FY17					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1201921F / *Service Support to STRATCOM - Space Activities*	**Project (Number/Name)** 67A011 / *Space Analysis and Application Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
- Review and update JMTs focused on the Sea Domain, and account for evolved Techniques, Tactics, and Procedures (TTPs) for those missions. - In coordination with European Command and Pacific Command, identify and select 4 joint missions for mission-level analysis and integration into campaign-level modeling - Analyze/assess modeling results to determine impact/effects of space activities on U.S. military campaigns and global operations - Assess and integrate enterprise-level model data for Environmental Monitoring and ISR space-based capabilities into campaign-level modeling - Coordinate and update Blue space order of battle data, Red counterspace order of battle data, and Red counterspace CONOPS to support integration of space into mission and campaign-level M&S - Support cost-benefit analyses of Offensive Space Control alternatives with quantifiable impacts to warfighter operations - Develop change request proposals and submit to STORM Configuration Control Board (CCB) to improve instantiation of denied/degraded Intelligence, Surveillance, and Reconnaissance (ISR) space-based capability and its effects on the Warfighter in STORM - In coordination with HAF/A9 (Headquarters Air Force Studies, Analyses and Assessments), develop schedule and identify funding requirements and sources toward implementation of approved change requests and improved instantiation of space and contested space capabilities in STORM - Provide Modeling, Simulation, and Analysis support to inform Air Force Space Command's Space Enterprise Vision (SEV) No OCO Requested					
FY 2020 Base Plans: Beginning in FY20 the RDT&E funding portfolio for the Space Analysis and Application Development program within USSTRATCOM transfers to the newly created PE 1202140F, USSPACECOM.					
FY 2020 OCO Plans: Please see BA07, PE1202140F, BPAC 67A011					
FY 2019 to FY 2020 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1201921F / *Service Support to STRATCOM - Space Activities*	**Project (Number/Name)** 67A011 / *Space Analysis and Application Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
See above					
Accomplishments/Planned Programs Subtotals	6.095	6.247	0.500	0.000	0.500

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Space Campaign Modeling and Simulation funding moved to the newly created USSPACECOM PE 1202140F beginning in FY20. All that will remain in BPAC 67A011 PE 1201921F is the Data Integration and Fusion Center RDT&E funding. It will be an on-going program. Cost to complete is N/A

D. Acquisition Strategy

Any new projects funded in this program will be awarded using competitive procedures to the maximum extent possible.

Best value to the government selected contractors, universities, government facilities, federally funded research and development centers, laboratories, or other organizations

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1201921F / *Service Support to STRATCOM - Space Activities*	**Project (Number/Name)** 67A011 / *Space Analysis and Application Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Model Space effects and evaluate current campaign models to determine feasibility to incorporate into space architectures	TBD	TBD : TBD	-	5.277	Oct 2017	5.447	Oct 2018	0.000		-		0.000	Continuing	Continuing	-
Data Integration and Fusion Center	C/Various	Multiple Gov/Civ Agencies : Schriever AFB, CO	-	0.818	Oct 2017	0.800	Oct 2018	0.500	Oct 2018	-		0.500	Continuing	Continuing	-
		Subtotal	-	6.095		6.247		0.500		-		0.500	Continuing	Continuing	N/A

Remarks

Best value to the government selected contractors, universities, government facilities, federally funded research and development centers, laboratories, or other organizations

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	6.095		6.247		0.500		-		0.500	Continuing	Continuing	N/A

Remarks

Beginning in FY20 the RDT&E funding in the USSTRATCOM Space Analysis and Application Development program is transferring into the newly created PE 1202140F, USSPACECOM

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1201921F / *Service Support to STRATCOM - Space Activities*	**Project (Number/Name)** 67A011 / *Space Analysis and Application Development*

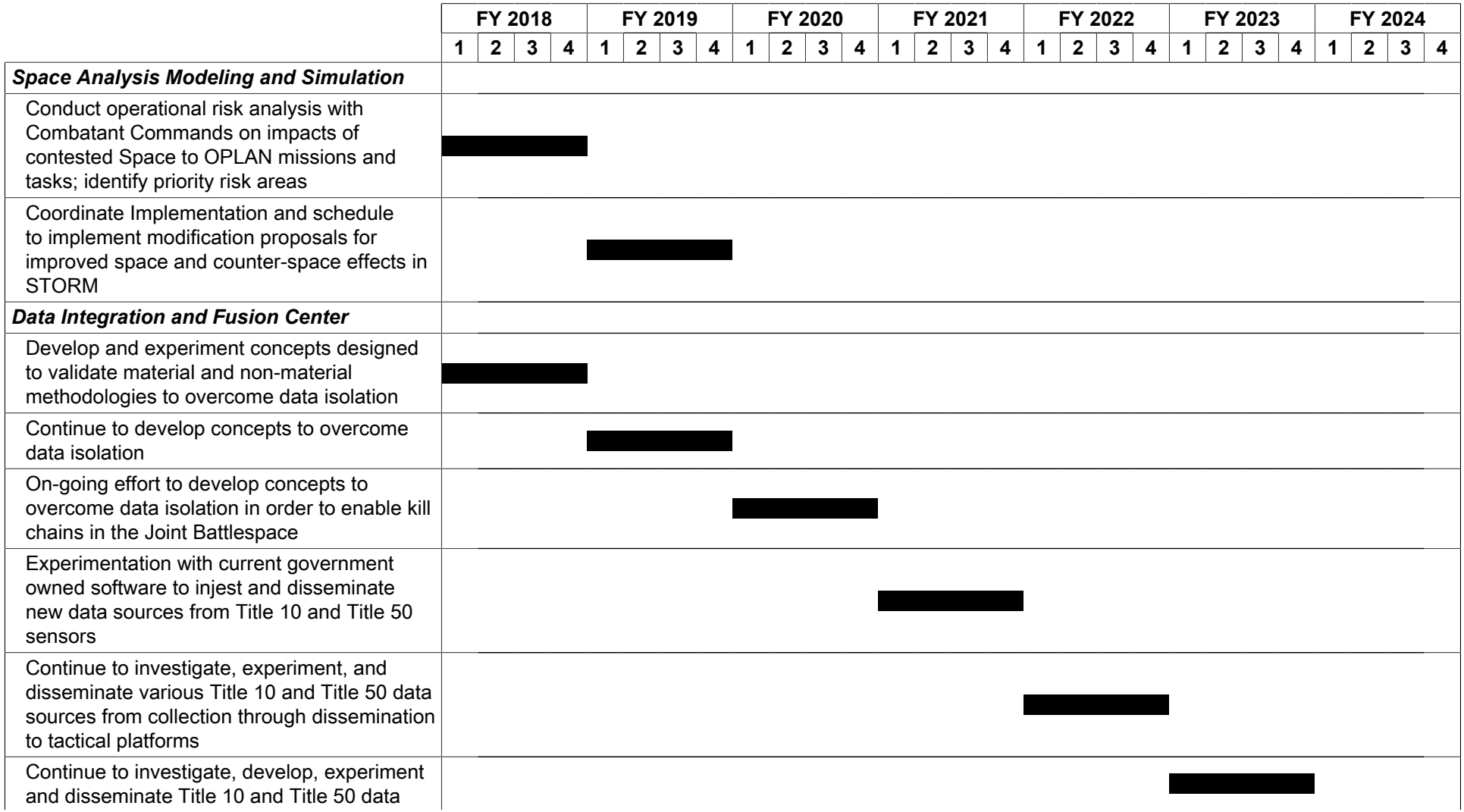

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1201921F / *Service Support to STRATCOM - Space Activities*	**Project (Number/Name)** 67A011 / *Space Analysis and Application Development*

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
sources from collection through distribution to tactical platforms																												
Continue to investigate, develop, experiment and disseminate Title 10 & Title 50 sources from collection through distribution to the Warfighter in the field																												

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1201921F / *Service Support to STRATCOM - Space Activities*	**Project (Number/Name)** 67A011 / *Space Analysis and Application Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Space Analysis Modeling and Simulation				
Conduct operational risk analysis with Combatant Commands on impacts of contested Space to OPLAN missions and tasks; identify priority risk areas	1	2018	4	2018
Coordinate Implementation and schedule to implement modification proposals for improved space and counter-space effects in STORM	1	2019	4	2019
Data Integration and Fusion Center				
Develop and experiment concepts designed to validate material and non-material methodologies to overcome data isolation	1	2018	4	2018
Continue to develop concepts to overcome data isolation	1	2019	4	2019
On-going effort to develop concepts to overcome data isolation in order to enable kill chains in the Joint Battlespace	1	2020	4	2020
Experimentation with current government owned software to injest and disseminate new data sources from Title 10 and Title 50 sensors	1	2021	4	2021
Continue to investigate, experiment, and disseminate various Title 10 and Title 50 data sources from collection through dissemination to tactical platforms	1	2022	4	2022
Continue to investigate, develop, experiment and disseminate Title 10 and Title 50 data sources from collection through distribution to tactical platforms	1	2023	4	2023
Continue to investigate, develop, experiment and disseminate Title 10 & Title 50 sources from collection through distribution to the Warfighter in the field	1	2024	4	2024

Note

Beginning in FY20 the funding portfolio for the Space Analysis Modeling and Simulation program within USSTRATCOM will transfer to the newly created PE 1202140F, USSPACECOM

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1202140F / *Service Support to U.S. SPACECOM Activities*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	11.863	0.000	11.863	9.014	9.192	9.324	9.567	Continuing	Continuing
672486: *JOINT NAVWAR CENTER (JNWC) SPACE ACTIVITIES*	-	0.000	0.000	7.467	0.000	7.467	7.513	7.583	7.723	7.862	Continuing	Continuing
67A011: *Space Analysis and Application Development*	-	0.000	0.000	4.396	0.000	4.396	1.501	1.609	1.601	1.705	Continuing	Continuing

Note

Prior to the FY20 PB cycle, The Space Analysis and Application Development Program (WSC 67A011) and the Joint Navigation and Warfare Center (WSC 672486) were reported under PE 1201921F, Service Support to STRATCOM - Space Activities. Beginning in FY20, the programs will be reported under the newly created PE 1202140F, Service Support to U.S. SPACECOM Activities

A. Mission Description and Budget Item Justification

The Space Analysis and Application Development program integrates space based effects into Department's 'Model of Record' for joint campaign analysis. Current modeling and simulation (M&S) models are inadequate to represent the contribution that U.S space capabilities make to the air, sea, and land fight and do not accurately portray current and future space threats. This line of effort integrates effects of space capabilities into the Synthetic Theater Operations Research Model (STORM) and other mission and campaign-level M&S tools. Enhanced space M&S will enable the DoD to make informed decisions regarding the direction of U.S. Space Doctrine, Tactics, Techniques, Procedures, and Resource Decisions. The DoD requires the ability to conduct campaign-level analysis to quantify the holistic operational impacts of adversary space actions on military campaigns and U.S. global operations.

Navigation Warfare (NAVWAR) is deliberate defensive and offensive action to assure positioning, navigation, and timing (PNT) information through coordinated employment of space, cyberspace, and electronic warfare (EW) operations. Funds are used to create and maintain NAVWAR knowledge. NAVWAR expertise is developed in part by execution of PNT Operational Field Assessments (POFAs). GYPSY POFA's are linked to Combatant Commander's (CCMD) Tier 1 exercises (USSTRATCOM's Global Lightning and Global Thunder are examples) and provide operational realistic threat-representative, GPS-contested environments for analytical assessment of air, ground, maritime, space & cyberspace mission capability. FORTUNE POFAs are PNT capability and vulnerability assessments associated with a Service exercise or mission event. PRISM POFAs encompass all Operations, Actions, and Activities (OAAs) associated with events outside of specific CCMD and/or service exercises or mission events. Assessments inform service acquisition decisions, capability gaps, intelligence gaps and tactics, techniques and procedures (TTP) development and implementation to mitigate effects on warfighter operations in the anticipated theater NAVWAR threat environments. JNWC assesses Department wide PNT posture through the PNT Annual assessment IAW DoDI 4650.08.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1202140F / *Service Support to U.S. SPACECOM Activities*

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	11.863	0.000	11.863
Total Adjustments	0.000	0.000	11.863	0.000	11.863
• 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	11.863	0.000	11.863

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1202140F / *Service Support to U.S. SPACECOM Activities*	Project (Number/Name) 672486 / *JOINT NAVWAR CENTER (JNWC) SPACE ACTIVITIES*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
672486: *JOINT NAVWAR CENTER (JNWC) SPACE ACTIVITIES*	-	0.000	0.000	7.467	0.000	7.467	7.513	7.583	7.723	7.862	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Beginning in FY20 all funding from RDT&E funding from PE 1201921F Service Support to STRATCOM - Space Activities, moved to PE 1202140F - Service Support to U.S. SPACECOM Activities

A. Mission Description and Budget Item Justification

Navigation Warfare (NAVWAR) is deliberate defensive and offensive action to assure positioning, navigation, and timing (PNT) information through coordinated employment of space, cyberspace, and electronic warfare (EW) operations. Funds are used to create and maintain NAVWAR knowledge. NAVWAR expertise is developed in part by execution of PNT Operational Field Assessments (POFAs). GYPSY POFA's are linked to Combatant Commander's (CCMD) Tier 1 exercises (USSTRATCOM's Global Thunder and Global Lightning are examples) and provide operational realistic threat-representative, GPS-contested environments for analytical assessment of air, ground, maritime, space & cyberspace mission capability. FORTUNE POFAs are PNT capability and vulnerability assessments associated with a Service exercise or mission event. PRISM POFAs encompass all Operations, Actions, and Activities (OAAs) associated with events outside of specific CCMD and/or service exercises or mission events. Assessments inform service acquisition decisions, capability gaps, intelligence gaps and tactics, techniques and procedures (TTP) development and implementation to mitigate effects on warfighter operations in the anticipated theater NAVWAR threat environments. JNWC assesses department wide PNT posture through the PNT Annual assessment IAW DoDI 4650.08.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: PNT Operational Assessments	0.000	0.000	7.467	0.000	7.467
Description: The JNWC will investigate, operationally assess, and simulate potential threats and mitigation strategies for denial of blue force PNT capabilities as well as preventing the hostile use of PNT information. Major Performers - Best value to the government selected contractors, universities, government facilities, federally funded research and development centers, laboratories, or other organizations					
FY 2019 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1202140F / *Service Support to U.S. SPACECOM Activities*	**Project (Number/Name)** 672486 / *JOINT NAVWAR CENTER (JNWC) SPACE ACTIVITIES*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Operational assessments - Simulate potential threats and mitigation strategies for potential denial of blue force PNT capabilities - Continuing development to prevent the hostile use of Positioning, Navigation and Timing (PNT) information ***FY 2020 Base Plans:*** Continuing Operational assessments - Simulate potential threats and mitigation strategies for potential denial of blue force PNT capabilities - Continuing development to prevent the hostile use of Positioning, Navigation and Timing (PNT) information. ***FY 2020 OCO Plans:*** No OCO requested ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase between FY19 ($7.427M in PE 1201921F) and 20 ($7.467M in PE 1202140F) is due to programmed inflation					
Accomplishments/Planned Programs Subtotals	0.000	0.000	7.467	0.000	7.467

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Prior to the FY20 PB cycle, The Joint Navigation Warfare Center was reported under PE 1201921F, WSC 672486. Beginning in FY20, the program will be reported under the newly created PE 1202140F, Service Support to U.S. SPACECOM Activities

D. Acquisition Strategy

New contracts will be awarded using competitive procedures to the maximum extent possible.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1202140F / *Service Support to U.S. SPACECOM Activities*	**Project (Number/Name)** 672486 / *JOINT NAVWAR CENTER (JNWC) SPACE ACTIVITIES*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Position Navigation and Timing Operational Field Assessments	PO	Multiple, Kirtland AFB NM : Kirtland, NM	-	-		-		7.467	Oct 2019	0.000		7.467	Continuing	Continuing	-
		Subtotal	-	-		-		7.467		0.000		7.467	Continuing	Continuing	N/A

Remarks

Prior to the FY20 PB cycle, The Joint Navigation and Warfare Center (JNWC) was reported under PE 1201921F, WSC 672486. Beginning in FY20, the program will be reported under the newly created PE 1202140F, Service Support to U.S. SPACECOM Activities

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		0.000		7.467		0.000		7.467	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1202140F / *Service Support to U.S. SPACECOM Activities*	**Project (Number/Name)** 672486 / *JOINT NAVWAR CENTER (JNWC) SPACE ACTIVITIES*

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Navigation Warfare (NAVWAR)																												
NAVWAR Operational Field Assessments																												
Create / Maintain NAVWAR Knowledge																												
NAVWAR Operational and CONOPS Events																												

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1202140F / *Service Support to U.S. SPACECOM Activities*	**Project (Number/Name)** 672486 / *JOINT NAVWAR CENTER (JNWC) SPACE ACTIVITIES*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Navigation Warfare (NAVWAR)				
NAVWAR Operational Field Assessments	1	2020	4	2024
Create / Maintain NAVWAR Knowledge	1	2020	4	2024
NAVWAR Operational and CONOPS Events	1	2020	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1202140F / *Service Support to U.S. SPACECOM Activities*	Project (Number/Name) 67A011 / *Space Analysis and Application Development*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
67A011: *Space Analysis and Application Development*	-	0.000	0.000	4.396	0.000	4.396	1.501	1.609	1.601	1.705	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Prior to the FY20 PB cycle, The Space Analysis and Application Development Program was reported under PE 1201921F, WSC 67A011. Beginning in FY20, the program will be reported under the newly created PE 1202140F, Service Support to U.S. SPACECOM Activities

This is NOT a new start.

A. Mission Description and Budget Item Justification

The Space Analysis and Application Development program Integrates space based effects into Department's 'Model of Record' for joint campaign analysis. Current modeling and simulation (M&S) models are inadequate to represent the contribution that U.S space capabilities make to the air, sea, and land fight and do not accurately portray current and future space threats. This line of effort integrates effects of space capabilities into the Synthetic Theater Operations Research Model (STORM) and other mission and campaign-level M&S tools. Enhanced space M&S will enable the DoD to make informed decisions regarding the direction of U.S. Space Doctrine, Tactics, Techniques, Procedures, and Resource Decisions. The DoD requires the ability to conduct campaign-level analysis to quantify the holistic operational impacts of adversary space actions on military campaigns and U.S. global operations.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Space Campaign Modeling and Simulation, Development/Modification/Verification/Validation	0.000	0.000	4.396	0.000	4.396
Description: Developed, modifies, verifies, and validates new models for Space mission areas and modifies existing models to portray new capabilities ***FY 2019 Plans:*** - Conduct mission-level modeling and analysis to quantify the effects of US and adversary space interactions, with focus on six of the Joint Mission Threads (JMTs) developed in FY17 - Review and update JMTs focused on the Sea Domain, and account for evolved Techniques, Tactics, and Procedures (TTPs) for those missions. - In coordination with European Command and Pacific Command, identify and select 4 joint missions for mission-level analysis and integration into campaign-level modeling					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1202140F / *Service Support to U.S. SPACECOM Activities*	**Project (Number/Name)** 67A011 / *Space Analysis and Application Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
- Analyze/assess modeling results to determine impact/effects of space activities on U.S. military campaigns and global operations - Assess and integrate enterprise-level model data for Environmental Monitoring and ISR space-based capabilities into campaign-level modeling - Coordinate and update Blue space order of battle data, Red counterspace order of battle data, and Red counterspace CONOPS to support integration of space into mission and campaign-level M&S - Support cost-benefit analyses of Offensive Space Control alternatives with quantifiable impacts to warfighter operations - Develop change request proposals and submit to STORM Configuration Control Board (CCB) to improve instantiation of denied/degraded Intelligence, Surveillance, and Reconnaissance (ISR) space-based capability and its effects on the Warfighter in STORM - In coordination with HAF/A9 (Headquarters Air Force Studies, Analyses and Assessments), develop schedule and identify funding requirements and sources toward implementation of approved change requests and improved instantiation of space and contested space capabilities in STORM - Provide Modeling, Simulation, and Analysis support to inform Air Force Space Command's Space Enterprise Vision (SEV) No OCO Requested					
FY 2020 Base Plans: - In coordination with HAF A/9 (HQ Air Force Studies, Analysis, and Assessments), develop schedule to identify requirements toward implementation of approved change requests and instantiation of space and contested space capabilities in STORM - Coordinate and update Blue space order of battle data, Red counter-space order of battle data, and Red counter-space CONOPS to support integration of contested space into mission and campaign-level M&S					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1202140F / *Service Support to U.S. SPACECOM Activities*	**Project (Number/Name)** 67A011 / *Space Analysis and Application Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
- Continue development of software and tools to model Red on Blue contested space (one versus one, many versus many, and space campaign-level) - Update likelihood assessment data for Red counter-space capability (likelihood to employ, and likelihood to be effective) to inform counter-space risk assessment and enterprise-level modeling - Review and update JMT consequence assessment used to inform risk analyses and enterprise level modeling - Utilize updated tools and data to support analytical efforts of new Space Analysis Consortium, and collaborate with partners to inform senior leader forums and decisions on space investments, requirements, acquisition, and operational risk decisions - Support cost benefit analyses of Space Control activities with quantifiable impacts to warfighter operations - Provide analysis support to inform Air Force Space Command's Space Enterprise Vision (SEV) No OCO Requested ***FY 2020 OCO Plans:*** No OCO requested ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Planned reduction between FY19 and FY20 is due to realignment of a portion of the RDT&E portfolio into Operations and Maintenance to support capabilities that have transitioned from a development program to an operational capability.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	4.396	0.000	4.396

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Prior to the FY20 PB cycle, The Space Analysis and Application Development Program was reported under PE 1201921F, WSC 67A011. Beginning in FY20, the program will be reported under the newly created PE 1202140F, Service Support to U.S. SPACECOM Activities

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1202140F / *Service Support to U.S. SPACECOM Activities*	**Project (Number/Name)** 67A011 / *Space Analysis and Application Development*

D. Acquisition Strategy

Any new projects funded in this program will be awarded using competitive procedures to the maximum extent possible.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1202140F / *Service Support to U.S. SPACECOM Activities*	**Project (Number/Name)** 67A011 / *Space Analysis and Application Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Model Space effects for two mission tasks and integrate into STORM for joint campaign analysis	C/CPAF	TBD : TBD	-	0.000	Oct 2018	0.000	Oct 2019	4.396	Oct 2019	0.000		4.396	Continuing	Continuing	-
		Subtotal	-	0.000		0.000		4.396		0.000		4.396	Continuing	Continuing	N/A

Remarks

Prior to the FY20 PB cycle, The Space Analysis and Application Development Program was reported under PE 1201921F, WSC 67A011. Beginning in FY20, the program will be reported under the newly created PE 1202140F, USSPACECOM

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.000		0.000		4.396		0.000		4.396	Continuing	Continuing	N/A

Remarks

Prior to the FY20 PB cycle, The Space Analysis and Application Development Program was reported under PE 1201921F, WSC 67A011. Beginning in FY20, the program will be reported under the newly created PE 1202140F, USSPACECOM

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1202140F / *Service Support to U.S. SPACECOM Activities*	**Project (Number/Name)** 67A011 / *Space Analysis and Application Development*

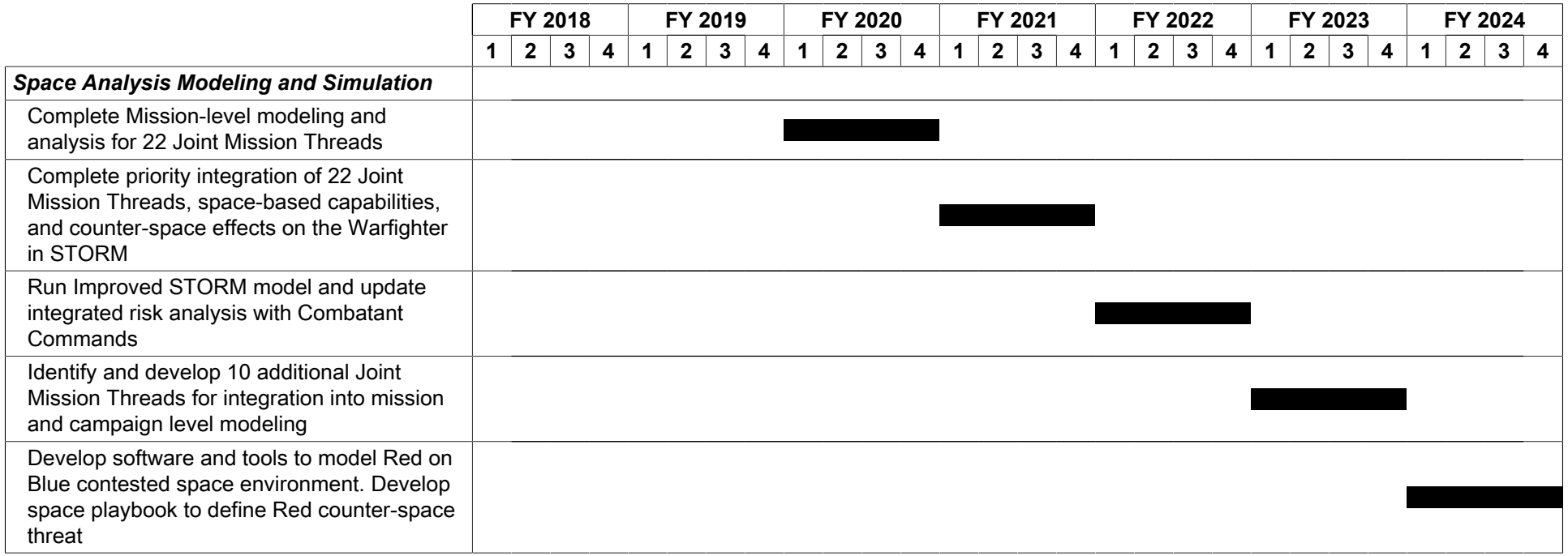

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1202140F / *Service Support to U.S. SPACECOM Activities*	**Project (Number/Name)** 67A011 / *Space Analysis and Application Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Space Analysis Modeling and Simulation				
Complete Mission-level modeling and analysis for 22 Joint Mission Threads	1	2020	4	2020
Complete priority integration of 22 Joint Mission Threads, space-based capabilities, and counter-space effects on the Warfighter in STORM	1	2021	4	2021
Run Improved STORM model and update integrated risk analysis with Combatant Commands	1	2022	4	2022
Identify and develop 10 additional Joint Mission Threads for integration into mission and campaign level modeling	1	2023	4	2023
Develop software and tools to model Red on Blue contested space environment. Develop space playbook to define Red counter-space threat	1	2024	4	2024

Note

Prior to the FY20 PB cycle, The Space Analysis and Application Development Program was reported under PE 1201921F, WSC 67A011. Beginning in FY20, the program will be reported under the newly created PE 1202140F, USSPACECOM

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 1202247F / *AF TENCAP*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	80.726	31.986	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
670001: *Air Force TENCAP*	-	80.726	31.986	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY2020, PE 1202247F, Air Force TENCAP efforts were transferred to PE 0207247F, Air Force TENCAP, in order to return program to the Major Force Program for General Purpose Forces.

A. Mission Description and Budget Item Justification

Air Force TENCAP increases warfighter effectiveness through the exploitation of national capabilities and promotes cross-domain integration of these capabilities into military operations/training and intelligence, surveillance and reconnaissance (ISR) activities.

AF TENCAP exploits existing air, space, cyber, national and global ISR, and Non-Traditional ISR (NTISR) for operational and tactical applications by rapidly prototyping and providing capability demonstrations. Projects are designed to transition to warfighters or national intelligence agencies for operational use, and to appropriate acquisition Programs of Record for sustainment and further development. AF TENCAP projects influence the design and operation of current and future air, space, cyber, national and global ISR, and NTISR systems while providing situational awareness to warfighters, national intelligence agency organizations, and units.

The program consists of multiple small projects supporting one of the Air Force Core Function Mission Areas (CFMAs). Projects are executed to provide continued support to Special Operations Forces and the warfighter, with impacts at the national, operational, and tactical levels.

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

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1202247F / *AF TENCAP*	

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	31.914	31.986	21.365	0.000	21.365
Current President's Budget	80.726	31.986	0.000	0.000	0.000
Total Adjustments	48.812	0.000	-21.365	0.000	-21.365
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	48.812	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	-21.365	0.000	-21.365

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Exploitation Applications	19.583	17.428	0.000	0.000	0.000
Description: Exploiting existing air, space, cyber, national and global ISR, and Non-Traditional ISR (NTISR) for operational and tactical applications by rapidly prototyping and demonstrating capabilities. Activities also influence the design and operation of future space, cyber, national and global ISR, and NTISR systems for tactical users.					
FY 2019 Plans: - Will continue to rapidly prototype projects and focus warfighter support and resource allocation based on AF TENCAP mission/investment areas - Will continue to execute projects which provide continued support to Special Operations Forces and the warfighter, with impacts at the national, operational, and tactical levels - Will continue focused effort to increase Air Domain Awareness to Air Force and Joint Warfighters					
FY 2020 Base Plans: N/A					
FY 2020 OCO Plans: N/A					
FY 2019 to FY 2020 Increase/Decrease Statement:					

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1202247F / *AF TENCAP*	

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
- Funding decreased due to transition of AF TENCAP to PE 0207247F					
Title: Talon SPITBALL ***Description:*** Talon SPITBALL is a technology prototype to develop jam-resistant antenna for next-generation aircraft. Talon SPITBALL will enable uninterrupted tactical communications and intelligence information for advanced aircraft operating in denied environments. ***FY 2019 Plans:*** - Will complete development, test, and transition of jam-resistant antenna for advanced aircraft ***FY 2020 Base Plans:*** N/A ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** - Funding decreased due to transition of capability to the warfighter	11.093	5.797	0.000	0.000	0.000
Title: Talon PIKE ***Description:*** Talon PIKE is a technology prototype to develop a counter-Unmanned Aerial System (UAS) capability for tactical users by leveraging national technical means. Talon PIKE will protect ground forces from UAS threats in hostile environments. ***FY 2019 Plans:*** - Will complete rapid prototype development, testing, and transition of counter-UAS capability ***FY 2020 Base Plans:*** N/A ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** - Funding decreased due to transition of capability to the warfighter	17.900	5.000	0.000	0.000	0.000
Title: Talon Tactical Mobile Over-the-Horizon Radar (TACMOR)	32.150	3.761	0.000	0.000	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1202247F / *AF TENCAP*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Description: Talon TACMOR is a technology prototype to expand air domain awareness and maritime domain awareness over the Western Pacific region. TACMOR is an FY17 Joint Capability Technology Demonstration project. ***FY 2019 Plans:*** - Will continue rapid prototype development of air and maritime domain awareness capability ***FY 2020 Base Plans:*** N/A ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** - Funding decreased due to transition of AF TENCAP to PE 0207247F					
Accomplishments/Planned Programs Subtotals	80.726	31.986	0.000	0.000	0.000

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• RDTE 07 0207247F: *AF TENCAP*	0.000	0.000	21.365	0.000	21.365	21.683	22.134	22.536	22.941	Continuing	Continuing

Remarks

N/A

E. Acquisition Strategy

Projects are selected based upon needs identified by the program's customers - DOD Departments, Combatant Commands, Components, MAJCOMs, and/or National Intelligence Agencies. Many projects are executed via existing contracts maintained by other agencies; others are executed via AF TENCAP contracts established with vendors responding to annual Broad Agency Announcements. The U.S. Government organization sponsoring a project is responsible for assuming acquisition, deployment, logistics, sustainment and budgetary responsibilities for the developed capability after it has been successfully demonstrated by AF TENCAP.

AF TENCAP projects typically use an incremental acquisition strategy. AF TENCAP utilizes a disciplined systems engineering approach that allows program teams to solve problems through a series of segments. Each increment has to be successful to pursue the following segment which mitigates cost and schedule risk.

Contracts funded in this program element will be awarded using competitive procedures to the maximum extent possible.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1202247F / *AF TENCAP*

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1202247F / *AF TENCAP*	**Project (Number/Name)** 670001 / *Air Force TENCAP*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Exploitation Applications	Various	Various : Various	-	18.583	Dec 2017	16.428	Dec 2018	-		-		-	Continuing	Continuing	-
Talon SPITBALL	C/CPFF	Ball Aerospace : Littleton, CO	-	11.093	Dec 2017	5.797	Dec 2018	-		-		-	Continuing	Continuing	-
Talon PIKE	MIPR	Sandia National Labs : Sandia, NM	-	17.900	Aug 2018	5.000	Dec 2018	-		-		-	Continuing	Continuing	-
Talon TACMOR	SS/CPFF	BAE Systems : Australia	-	32.150	Apr 2018	3.761	Apr 2019	-		-		-	Continuing	Continuing	-
		Subtotal	-	79.726		30.986		-		-		-	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Oversight (PMA)	Various	Various : Various	-	1.000	Dec 2017	1.000	Dec 2018	-		-		-	Continuing	Continuing	-
		Subtotal	-	1.000		1.000		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	80.726		31.986		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1202247F / *AF TENCAP*	**Project (Number/Name)** 670001 / *Air Force TENCAP*

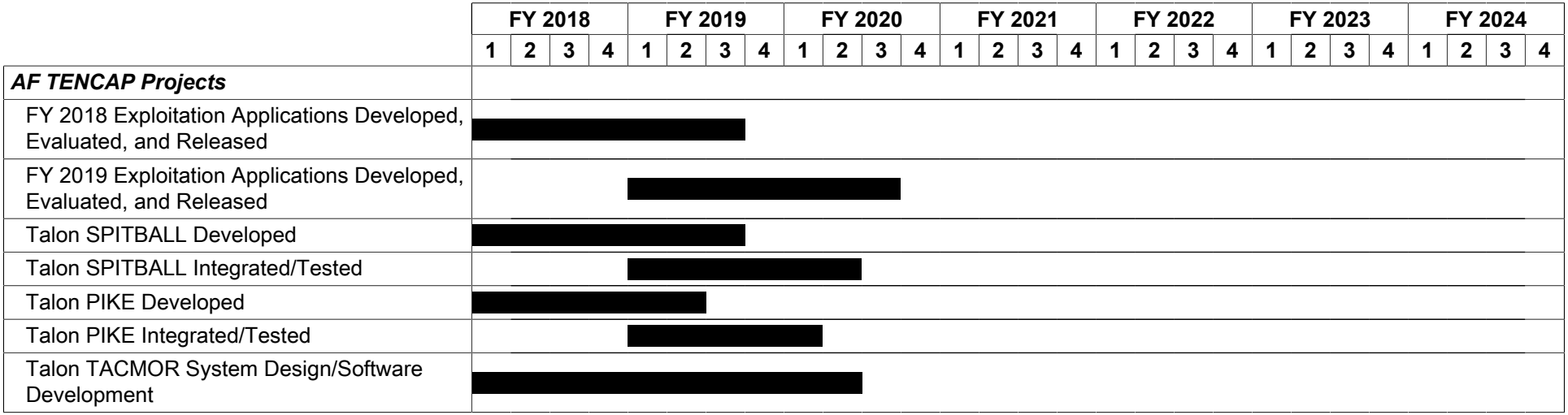

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1202247F / *AF TENCAP*	**Project (Number/Name)** 670001 / *Air Force TENCAP*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
AF TENCAP Projects				
FY 2018 Exploitation Applications Developed, Evaluated, and Released	1	2018	3	2019
FY 2019 Exploitation Applications Developed, Evaluated, and Released	1	2019	3	2020
Talon SPITBALL Developed	1	2018	3	2019
Talon SPITBALL Integrated/Tested	1	2019	2	2020
Talon PIKE Developed	1	2018	2	2019
Talon PIKE Integrated/Tested	1	2019	1	2020
Talon TACMOR System Design/Software Development	1	2018	2	2020

Note

Most project selection activities occur approximately per the timelines shown, but some projects are initiated on a rolling basis throughout each year in response to time-sensitive operational requirements.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force												Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 1203001F / *Family of Advanced BLoS Terminals (FAB-T)*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	26.262	60.168	197.388	0.000	197.388	246.010	190.594	99.569	76.220	0.000	896.211
672490: *Family of Advanced Beyond Line-of-Sight Terminals (FAB-T)*	0.000	26.262	60.168	16.000	0.000	16.000	17.000	15.000	0.000	0.000	0.000	134.430
673035: *Presidential and National Voice Conferencing*	0.000	0.000	0.000	65.911	0.000	65.911	62.219	43.525	27.887	3.247	0.000	202.789
673040: *Force Element Terminal*	0.000	0.000	0.000	115.477	0.000	115.477	166.791	132.069	71.682	72.973	0.000	558.992
Program MDAP/MAIS Code: 199												

A. Mission Description and Budget Item Justification

The FAB-T project replaces legacy Milstar terminals and will provide Extremely High Frequency (EHF), protected high data rate communication for nuclear and conventional forces to include Presidential and Nation Voice Conferencing (PNVC). FAB-T will provide the new, highly secure, state-of-the-art capability for DoD platforms to include strategic platforms and airborne/ground command posts via Milstar, AEHF, and Enhanced Polar System (ESP) Satellites. FAB-T terminals will also support the critical command and control (C2) of the Milstar, AEHF and EPS satellite constellations. The Air Force will continue development of the FAB-T Command Post Terminal (CPT), performing activities to meet current and future emerging SATCOM requirements.

The Force Element Terminal (FET) project provides secure, protected, and survivable communications for the strategic and tactical warfighter through airborne based MILSATCOM terminals, The FET will provide the B-52, and RC-135 aircraft with worldwide nuclear and non-nuclear survivable, anti-jam Low Probability of Detect (LPD)/ Low Probability of Intercept (LPI), data and voice communications. The FET will be interoperable with Milstar, AEHF, Enhanced Polar Systems - Recapitalization (EPS-R), and Evolved Strategic SATCAM (ESS) Satellite constellations utilizing both Low Data Rate (LDR) and Extended Data Rate (XDR) waveforms.

The PNVC capability is a critical element of the Nuclear Command, Control, and communications (NC3) System. PNVC is the Survivable Emergency Conferencing Network (SECN) replacement capability which provides anti-jam, anti-scintillation, survivable, and endurable voice communications through the AEHF satellite system for national and strategic users. There are several components being developed and procured by other organizations that must be synchronized to expeditiously field the capability. The PNVC Integrator is responsible for end-to-end integration of these components, to include requirements traceability, end-to-end system testing, configuration and checkout activities, training and technical manuals, network transition support, identification of deficiencies in overall PNVC system capability, enterprise and life cycle support for PNVC components. The AFPEO-SP approved entry into the acquisition lifecycle as post MS-A ACAT III Program of Record in January 2016. Starting in December 2018 PNVC Integrator is responsible for all program elements' requests for funding related to the Defense Information Systems and Agency (DISA) components of the PNVC System in accordance with FY 2018 National Defense Authorization Act, Sec. 1661.

Space acquisition must respond with speed and agility to emerging adversary threats. Space & Missile Systems Center (SMC) is transforming the organization and implementation of space acquisition to an enterprise approach, maximizing innovation and resiliency, leveraging international, commercial, and mission partnerships,

and managing program/project priorities according to an integrated unclassified/classified enterprise space architecture. Expanding the appropriate acquisition authorities and contract mechanisms to deliver capability sooner, SMC will strategically execute experimentation, prototyping, risk reduction, and other efforts to develop new or repurpose capabilities.

The FY 2020 funding request was reduced by $12.154 million to account for the availability of prior year execution balances.

Reduce Family of Beyond Line-of-Sight Terminal (FAB-T) Force Element Terminal (FET) saved $29.700M in FY 2020. Reduce Family of Beyond Line-of-Sight Terminal (FAB-T) Force Element Terminal (FET) description: Redirects an identified FY 2020 excess in RDT&E funding to programs aligned with the National Defense Strategy for improvement of lethality, such as Kill Chain Automation.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	32.426	80.168	184.320	0.000	184.320
Current President's Budget	26.262	60.168	197.388	0.000	197.388
Total Adjustments	-6.164	-20.000	13.068	0.000	13.068
• Congressional General Reductions	-1.134	0.000			
• Congressional Directed Reductions	-5.000	-20.000			
• 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	-0.030	0.000			
• Other Adjustments	0.000	0.000	13.068	0.000	13.068

Change Summary Explanation

FY 2018: -$5.000M Congressional Reduction for prior year carryover
FY 2019: -$20.000M Congressional Reduction; FET Terminals early to need
FY 2020: -$41.840M Reduction to FAB-T FET; +$35.900M increase to PNVC

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203001F / *Family of Advanced BLoS Terminals (FAB-T)*	Project (Number/Name) 672490 / *Family of Advanced Beyond Line-of-Sight Terminals (FAB-T)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
672490: *Family of Advanced Beyond Line-of-Sight Terminals (FAB-T)*	0.000	26.262	60.168	16.000	0.000	16.000	17.000	15.000	0.000	0.000	0.000	134.430
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In FY 2020 PE 1203001F, Project 672490, transferred to PE 1203001F, Project 673035 for PNVC and Project 673040 for FET for program transparency.

The FAB-T program replaces legacy Milstar terminals and will provide Extremely High Frequency (EHF), protected high data rate communication for nuclear and conventional forces to include Presidential and National Voice Conferencing (PNVC). FAB-T will provide this new, highly secure, state-of-the-art capability for DoD platforms to include strategic platforms and airborne/ground command posts via Milstar, AEHF, and Enhanced Polar System (EPS) satellites. FAB-T terminals will also support the critical command and control (C2) of the Milstar, AEHF and EPS satellite constellations. The Air Force will continue development of the FAB-T Command Post Terminal (CPT), performing systems engineering, architecture studies, development & operational test efforts, FAB-T terminal interoperability with the full AEHF satellite constellation activities, and other program activities to meet current and future emerging SATCOM requirements.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: FAB-T CPT Development	1.859	0.100	16.000
Description: The FAB-T program will provide EHF voice and data MILSATCOM for nuclear and conventional forces as well as airborne and ground command posts with connectivity to Milstar, AEHF, and EPS satellites. ***FY 2019 Plans:*** The FAB-T program provides EHF voice and data MILSATCOM for nuclear and conventional forces as well as airborne and ground command posts with connectivity to Milstar, AEHF, and EPS satellites. ***FY 2020 Plans:*** The FAB-T program will continue to provide EHF voice and data MILSATCOM for nuclear and conventional forces as well as airborne and ground command posts with connectivity to Milstar, AEHF, and EPS satellites. Additional development will be for National Security Agency (NSA) AEHF terminal certification. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 increased compared to FY 2019 by $15.900M. Justification for this increase is described in the plans above.			
Title: PNVC Integrator	18.810	28.346	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203001F / *Family of Advanced BLoS Terminals (FAB-T)*	**Project (Number/Name)** 672490 / *Family of Advanced Beyond Line-of-Sight Terminals (FAB-T)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: PNVC is the SECN replacement capability which provides anti-jam, anti-scintillation, survivable, and endurable voice communications through the AEHF satellite system for national and strategic users. The PNVC capability consists of constituent programs being developed and produced by other organizations. This program will integrate test and support configuration of hardware from these other programs. PNVC components will be installed at ground fixed and mobile command locations, as well as in the airborne E-4B, E-6B and Very Important Person Special Airlift Mission (VIPSAM) aircraft. ***FY 2019 Plans:*** Award Product Support Integrator contract activity to complete training, technical publications and conclude Developmental and Operational Testing activities. Execute further Developmental Test focused on system functional performance with an expanded number of network participants to address all nodes (fixed, transportable, airborne and special users) in a scintillated environment with component variants. Continue support of fielding activities and site checkout. Continue program office and other related support activities that may include, but are not limited to studies, technical analysis, etc. ***FY 2020 Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A			
Title: FAB-T FET ***Description:*** Funding ensures the continued development of Force Element Terminals. Development activities related to FET design, development and qualification testing will be executed. ***FY 2019 Plans:*** Funding for the continued development of Force Element Terminals. Activities will include, but not limited to, development and coordination of regulatory and statutory Milestone documents, technical requirements definition, and FET Request for Proposal (RFP) planning for award of a development contract in FY 2019. Funding will also be used for technology risk reduction activities and platform environmental studies to ensure a viable AEHF terminal can be developed in timely manner for the B-52 and RC-135. ***FY 2020 Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A	5.593	31.722	0.000
Accomplishments/Planned Programs Subtotals	26.262	60.168	16.000

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203001F / *Family of Advanced BLoS Terminals (FAB-T)*	**Project (Number/Name)** 672490 / *Family of Advanced Beyond Line-of-Sight Terminals (FAB-T)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APAF 05 FBLOST: *FAB-T*	12.553	14.293	9.610	-	9.610	5.062	0.000	0.000	-	0.000	41.518
• APAF 05 PNVC: *PNVC*	2.464	-	-	-	-	-	-	-	-	0.000	2.464
• SPAF 01 FBLOST: *FAB-T*	78.737	27.867	32.105	-	32.105	8.497	0.000	0.000	-	0.000	147.206
• SPAF 02 PNVC: *PNVC*	2.214	-	1.915	-	1.915	5.246	5.877	1.578	1.607	0.000	18.437
• SPAF FET:: *FET*	-	-	-	-	-	-	-	88.913	90.515	0.000	179.428
• SPAF FAB-T: *FAB-T*	1.343	6.141	0.000	-	0.000	0.000	0.000	-	-	0.000	7.484
• SPAF 02 SSPARE Spares and Repair...: *FAB-T*	3.598	15.863	0.057	-	0.057	0.000	0.000	-	-	0.000	19.518

Remarks

D. Acquisition Strategy

FAB-T Acquisition Strategy: In FY 2012, the government restructured the FAB-T development program to introduce competition into the acquisition strategy in order to reduce risk in delivering this capability as well as to drive down production costs. To ensure the best value to the government, the Air Force awarded production contracts in September 2013 to both contractors (Boeing and Raytheon). The production contracts began with production planning for both contractors. In June 2014, the Air Force down-selected to Raytheon. Development and production of FAB-T Command Post Terminals continued with Raytheon. The first Production contract options to produce CPT terminals were exercised after a successful Milestone C decision was approved September 1, 2015.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203001F / *Family of Advanced BLoS Terminals (FAB-T)*	**Project (Number/Name)** 672490 / *Family of Advanced Beyond Line-of-Sight Terminals (FAB-T)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FAB-T CPT Prime Contract	C/Various	Raytheon : Marlboro, MA	0.000	0.029	Dec 2018	-		12.677	Oct 2019	-		12.677	0.000	12.706	-
FAB-T CPT Technical Mission Analysis	Various	MITRE : Various, MA	0.000	1.435	Nov 2018	-		1.200	Oct 2019	-		1.200	0.000	2.635	-
FAB-T CPT GFE	Various	TBD : TBD	0.000	-		-		0.400	Oct 2019	-		0.400	0.000	0.400	-
FAB-T FET Prime Contracts	Various	Various : Various, MA	0.000	2.296	Jan 2018	13.910	Dec 2018	-		-		-	0.000	16.206	-
FAB-T FET Technical Mission Analysis	Various	Various : Various, MA	0.000	1.519	Jan 2018	2.750	Dec 2018	-		-		-	0.000	4.269	-
PNVC Prime Contract	Various	Various : Various, MA	0.000	12.210	Feb 2018	12.400	Jan 2019	-		-		-	0.000	24.610	-
PNVC Technical Mission Analysis	Various	Various : Various, MA	0.000	2.300	Jan 2018	6.400	Oct 2018	-		-		-	0.000	8.700	-
PNVC Enterprise SE&I	Various	Various : Various, MA	0.000	2.500	Jan 2018	1.900	Nov 2018	-		-		-	0.000	4.400	-
PNVC GFE/GFP	Various	Various : Various, MA	0.000	0.200	Jan 2018	7.000		-		-		-	0.000	7.200	-
		Subtotal	0.000	22.489		44.360		14.277		-		14.277	0.000	81.126	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FAB-T CPT Test	PO	Various : Various	0.000	0.116	Dec 2018	-		0.523	Dec 2019	-		0.523	0.000	0.639	-
FAB-T FET Test and Evaluation	PO	Various : Various	0.000	-		-		-		-		-	0.000	0.000	-
PNVC Government Test and LDTO Support	PO	Various : Various	0.000	0.000		2.400	Apr 2019	-		-		-	0.000	2.400	-
		Subtotal	0.000	0.116		2.400		0.523		-		0.523	0.000	3.039	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203001F / *Family of Advanced BLoS Terminals (FAB-T)*	**Project (Number/Name)** 672490 / *Family of Advanced Beyond Line-of-Sight Terminals (FAB-T)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FAB-T CPT FFRDC	Various	Various : TBD	0.000	0.204	Dec 2018	-		-		-		-	0.000	0.204	-
FAB-T FET Other Support	Various	Various : MA	0.000	0.057	Oct 2017	0.589	Dec 2018	-		-		-	0.000	0.646	-
FAB-T FET A&AS	Various	Various : MA	0.000	1.721	Jan 2018	6.373	Mar 2019	-		-		-	0.000	8.094	-
PNVC FFRDC	MIPR	Various : CA	0.000	0.100		0.200	Nov 2018	-		-		-	0.000	0.300	-
PNVC A&AS	Various	Various : TBD	0.000	0.500	Mar 2019	2.096	Nov 2018	-		-		-	0.000	2.596	-
PNVC Other Support	Various	Various : MA	0.000	1.000		4.100	Nov 2018	-		-		-	0.000	5.100	-
FAB-T CPT Other Support	Various	Various : MA	0.000	0.075		0.050		1.200	Nov 2019	-		1.200	0.000	1.325	-
		Subtotal	0.000	3.657		13.408		1.200		-		1.200	0.000	18.265	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	26.262		60.168		16.000		-		16.000	0.000	102.430	N/A

Remarks

Prior Years funding, FY 2016/FY 2017 $95.229M was executed in PE 0303001F. Prior to FY 2016, $180.602M was executed in PE 0303601F.

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203001F / *Family of Advanced BLoS Terminals (FAB-T)*	**Project (Number/Name)** 672490 / *Family of Advanced Beyond Line-of-Sight Terminals (FAB-T)*

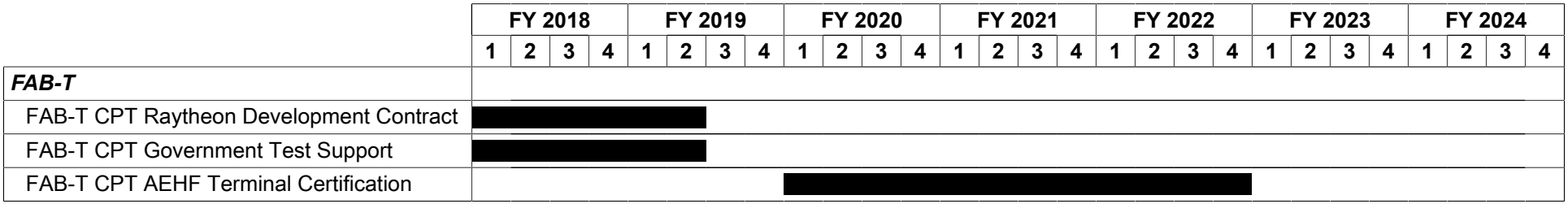

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203001F / *Family of Advanced BLoS Terminals (FAB-T)*	**Project (Number/Name)** 672490 / *Family of Advanced Beyond Line-of-Sight Terminals (FAB-T)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
FAB-T				
FAB-T CPT Raytheon Development Contract	1	2018	2	2019
FAB-T CPT Government Test Support	1	2018	2	2019
FAB-T CPT AEHF Terminal Certification	1	2020	4	2022

Note

FAB-T Raytheon Development Contract actual award date 4Q 2012, completion is 2Q 2019.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203001F / *Family of Advanced BLoS Terminals (FAB-T)*	Project (Number/Name) 673035 / *Presidential and National Voice Conferencing*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
673035: *Presidential and National Voice Conferencing*	0.000	0.000	0.000	65.911	0.000	65.911	62.219	43.525	27.887	3.247	0.000	202.789
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project is not a New Start. In FY 2020 PE 1203001F, the PNVC effort in Project 672490 transferred to PE 1203001F, Project 673035, PNVC, for additional transparency.

The PNVC capability is a critical element of the Nuclear Command, Control, and Communications (NC3) System. PNVC is the Survivable Emergency Conferencing Network (SECN) replacement capability which provides anti-jam, anti-scintillation, survivable, and endurable voice communications through the AEHF satellite system for national and strategic users. There are several components being developed and procured by other organizations that must be synchronized to expeditiously field this capability. The PNVC Integrator is responsible for end-to-end integration of these components, to include requirements traceability, end-to-end system testing, configuration and checkout activities, training and technical manuals, network transition support, identification of deficiencies in overall PNVC system capability, enterprise and life cycle support for PNVC components. The AFPEO/SP approved entry into the acquisition lifecycle as a post MS-A ACAT III Program of Record in January 2016. Starting in December 2018, PNVC Integrator is responsible for all program elements' requests for funding related to the Defense Information Systems Agency (DISA) components of the PNVC System in accordance with FY 2018 National Defense Authorization Act, Sec. 1661.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: PNVC Integrator	0.000	0.000	65.911
Description: PNVC is the SECN replacement capability which provides anti-jam, anti-scintillation, survivable, and endurable voice communications through the AEHF satellite system for national and strategic users. The PNVC capability consists of constituent programs being developed and produced by other organizations. This program will integrate test and support configuration of hardware from these other programs. PNVC components will be installed at ground fixed and mobile command locations as well as in the airborne E-4B, E-6 and Very Important Person Special Airlift Mission (VIPSAM) aircraft.			
FY 2019 Plans: PNVC was included in project 672490 in FY 2019.			
FY 2020 Plans: PNVC Integrator government team will conduct Phase 1 Developmental Test for ground based systems, with prime contractor support. In parallel, prime contractor and component contractors will identify and resolve hardware and software deficiencies identified during risk reduction testing, and conduct regression and interoperability testing post-disposition using both contractor and government test laboratories. Prime contractor will also be conducting Phase 2 risk reduction and contractor test for three			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203001F / *Family of Advanced BLoS Terminals (FAB-T)*	**Project (Number/Name)** 673035 / *Presidential and National Voice Conferencing*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
airborne and SMART-T systems, and completing integration and checkout of PNVC systems at 12 locations world-wide. Finally, government and contract teams will conduct technical order verification and conducting user training across all nodes and sites. Planning and support activities will include qualification test planning, logistics support planning, risk reduction activities, technical analysis and studies, platform integration support, and program office support. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, prototyping, etc. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 increased by $27.003M compared to FY 2019 due to establishment of new project line for PNVC.			
Accomplishments/Planned Programs Subtotals	0.000	0.000	65.911

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• RDTE 07 672490: *PNVC*	18.810	36.496	-	-	-	-	-	-	-	0.000	55.306
• APAF 05 FBLOST: *FAB-T*	12.553	14.293	9.610	-	9.610	5.062	-	-	-	0.000	41.518
• APAF 05 PNVC: *PNVC*	2.464	-	-	-	-	-	-	-	-	0.000	2.464
• SPAF 03 FBLOST: *FAB-T*	78.837	27.867	32.105	-	32.105	8.497	-	0.000	-	0.000	147.306
• SPAF 03 PNVC: *PNVC*	2.214	-	-	-	-	-	-	-	-	0.000	2.214
• SPAF 03 FET: *FET*	-	-	-	-	-	-	-	88.913	90.515	0.000	179.428
• APAF 05 Aircraft Spares and Repa...: *FAB-T*	1.343	6.141	-	-	-	-	-	-	-	0.000	7.484
• SPAF 03 SSPARE Spares and Repair...: *FAB-T*	3.598	15.583	0.057	-	0.057	-	-	-	-	0.000	19.238

Remarks

In FY 2020, PE 1203001F, PE Family of Advanced Beyond Line-of-Sight Terminals, Project 673035, Presidential and National Voice Conferencing efforts were transferred from PE 1203001F, PE Family of Advanced Beyond Line-of-Sight Terminals, Project 672490, Family of Advanced Beyond Line-of-Sight Terminals.

D. Acquisition Strategy

PNVC Acquisition Strategy: On May 15, 2015 the Deputy Secretary of Defense assigned the PNVC End-to-End Integration responsibility to the Air Force; effective May 16, 2015, SAF/AQ designated the AFPEO/SP. The PNVC End-to-End Integrator program is responsible for requirements traceability, End-to-End system testing, site configuration activities, training and technical manuals, network transition support, identifying deficiencies in the PNVC capability, and enterprise and life cycle support

for all PNVC components. Starting in December 2018 PNVC Integration is responsible for all program elements' requests for funding related to the Defense Information Systems and Agency (DISA) components of the PNVC System in accordance with FY 2018 National Defense Authorization Act, Sec. 1661.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203001F / *Family of Advanced BLoS Terminals (FAB-T)*	**Project (Number/Name)** 673035 / *Presidential and National Voice Conferencing*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PNVC Prime Contract	Various	Various : Various, MA	0.000	-		-		43.111	Jan 2020	-		43.111	Continuing	Continuing	-
PNVC Technical Mission Analysis	Various	Various : Various, MA	0.000	-		-		6.800	Oct 2019	-		6.800	Continuing	Continuing	-
PNVC Enterprise SE&I	Various	Various : Various, MA	0.000	-		-		1.900	Nov 2019	-		1.900	Continuing	Continuing	-
PNVC GFE/GFP	Various	Various : Various, MA	0.000	-		-		0.000	Jan 2020	-		0.000	Continuing	Continuing	-
		Subtotal	0.000	-		-		51.811		-		51.811	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PNVC Government Test and LDTO Support	Various	Various : Various	0.000	-		-		2.500	Apr 2020	-		2.500	Continuing	Continuing	-
		Subtotal	0.000	-		-		2.500		-		2.500	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PNVC FFRDC	MIPR	TBD : TBD	0.000	-		-		0.200	Nov 2019	-		0.200	Continuing	Continuing	-
PNVC A&AS	Various	Various : Various TBD	0.000	-		-		2.200	Oct 2019	-		2.200	Continuing	Continuing	-
PNVC Other Support	Various	Various : MA	0.000	-		-		9.200	Oct 2019	-		9.200	Continuing	Continuing	-
		Subtotal	0.000	-		-		11.600		-		11.600	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203001F / *Family of Advanced BLoS Terminals (FAB-T)*	Project (Number/Name) 673035 / *Presidential and National Voice Conferencing*	

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	-		0.000		65.911		-		65.911	Continuing	Continuing	N/A

Remarks

In FY 2020, PE 1203001F, PE Family of Advanced Beyond Line-of-Sight Terminals, Project 673035, Presidential and National Voice Conferencing efforts were transferred from PE 1203001F, PE Family of Advanced Beyond Line-of-Sight Terminals, Project 672490, Family of Advanced Beyond Line-of-Sight Terminals.

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203001F / *Family of Advanced BLoS Terminals (FAB-T)*	**Project (Number/Name)** 673035 / *Presidential and National Voice Conferencing*

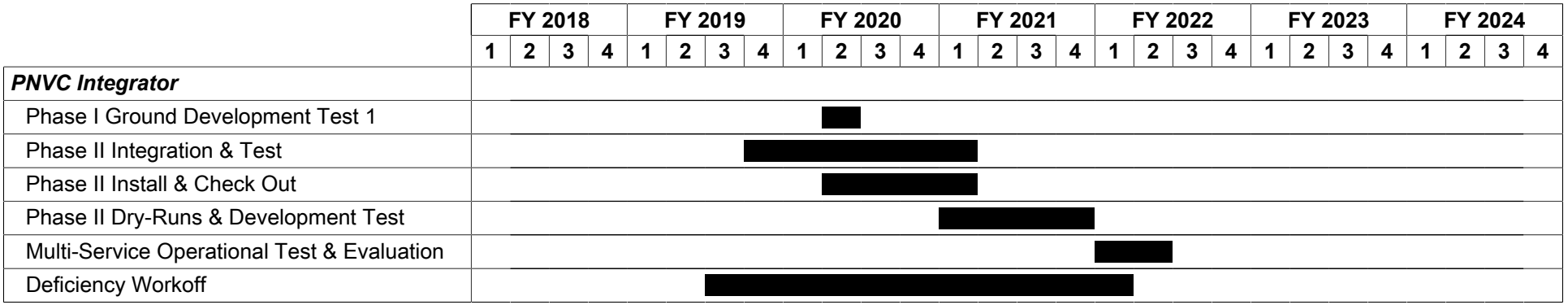

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203001F / *Family of Advanced BLoS Terminals (FAB-T)*	**Project (Number/Name)** 673035 / *Presidential and National Voice Conferencing*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
PNVC Integrator				
Phase I Ground Development Test 1	2	2020	2	2020
Phase II Integration & Test	4	2019	1	2021
Phase II Install & Check Out	2	2020	1	2021
Phase II Dry-Runs & Development Test	1	2021	4	2021
Multi-Service Operational Test & Evaluation	1	2022	2	2022
Deficiency Workoff	3	2019	1	2022

Note

FAB-T / FET was started in prior year BPAC 672490.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203001F / *Family of Advanced BLoS Terminals (FAB-T)*	Project (Number/Name) 673040 / *Force Element Terminal*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
673040: *Force Element Terminal*	0.000	0.000	0.000	115.477	0.000	115.477	166.791	132.069	71.682	72.973	0.000	558.992
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project is not a New Start. In FY 2020, PE 1203001F, Family of Advanced Beyond Line-of-Sight Terminals, Project 673040, Force Element Terminal efforts were transferred from PE 1203001F, PE Family of Advanced Beyond Line-of-Sight Terminals, Project 672490, Family of Advanced Beyond Line of Sight Terminals to provide program transparency.

The Force Element Terminal (FET) program provides secure, protected, and survivable communications for the strategic and tactical warfighter through airborne based MILSATCOM terminals. The FET will provide the B-52, and RC-135 aircraft with worldwide nuclear and non-nuclear survivable, anti-jam, Low Probability of Detect (LPD)/Low Probability of Intercept (LPI), data and voice communications. The FET will be interoperable with Milstar, AEHF, Enhanced Polar Systems - Recapitalization (EPS-R), and Evolved Strategic SATCOM (ESS) Satellite constellations utilizing both Low Data Rate (LDR) and Extended Data Rate (XDR) waveforms.

The FY 2020 funding request was reduced by $12.154 million to account for the availability of prior year execution balances.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: FAB-T FET	0.000	0.000	115.477
Description: Description: Continue development of Force Element Terminals. Development activities include, but are not limited to, FET design, development and qualification testing. ***FY 2019 Plans:*** FAB-T FET was included BPAC 672490 in FY 2019. ***FY 2020 Plans:*** Funding is for the continued development of Force Element Terminals. Design activities will include, but not limited to, the conduct of design reviews including a Systems Requirement Review, Preliminary Design Review, and Critical Design Review. FET development activities will include nuclear hardness parts analysis and testing, performance of reliability growth testing, and fabrication of prototypes and test assets to support terminal environmental and functional qualification and flight testing. Planning and support activities will include qualification test planning, logistics support planning, risk reduction activities, technical analysis and studies, platform integration support, and program office support. Rapidly respond to implement system resiliency			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203001F / *Family of Advanced BLoS Terminals (FAB-T)*	**Project (Number/Name)** 673040 / *Force Element Terminal*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, prototyping, etc. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 increased by $115.477 compared to FY 2019. This increase is due to establishment of new Project line.			
Accomplishments/Planned Programs Subtotals	0.000	0.000	115.477

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• RDTE 04 672490: *FET*	5.575	43.672	-	-	-	-	-	-	-	0.000	49.247
• APAF 05 FBLOST: *FAB-T*	22.252	14.292	9.610	-	9.610	5.062	-	-	-	0.000	51.216
• APAF 05 PNVC: *PNVC*	2.464	-	-	-	-	-	-	-	-	0.000	2.464
• SPAF 01 FBLOST: *FAB-T*	78.737	27.867	32.105	-	32.105	8.497	-	88.913	-	0.000	236.119
• PNVC: *PNVC*	2.214	-	-	-	-	-	-	-	-	0.000	2.214
• SPAF FET: *FET*	-	-	-	-	-	-	-	88.913	90.515	0.000	179.428
• APAF 05 Aircraft Spares and Repa...: *FAB-T*	1.343	6.141	0.000	-	0.000	-	-	-	-	0.000	7.484
• SSPARE Spares and Repair Parts: *FAB-T*	3.598	15.583	0.057	-	0.057	-	-	-	-	0.000	19.238

Remarks

D. Acquisition Strategy

FET Acquisition Strategy: Per the Vector Check brief to SAF/AQ on November 8, 2018, FET will pursue a Rapid Prototyping development approach under Section 804 of the National Defense Authorization Act for FY 2016 (Public Law 114-92). FET will award a development effort in FY 2019 leading to a production decision in FY 2023. The development effort includes system design and build of sufficient test assets to allow for expeditious development, testing, qualification and integration support of the FET capability. FET will meet B-52 and RC-135 platform requirements to support USSTRATCOM's Strategic Nuclear Command Control and Communication (NC3) mission.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203001F / *Family of Advanced BLoS Terminals (FAB-T)*	**Project (Number/Name)** 673040 / *Force Element Terminal*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FAB-T FET Development Contracts	Various	TBD : TBD, MA	0.000	-		-		76.076	Oct 2019	-		76.076	Continuing	Continuing	-
FAB-T FET Technical Mission Analysis	Various	TBD : TBD, MA	0.000	-		-		7.197	Oct 2019	-		7.197	Continuing	Continuing	-
		Subtotal	0.000	-		-		83.273		-		83.273	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FAB-T FET Test & Evaluation and Assets	PO	Multiple Agencies : TBD	0.000	-		-		16.417	Nov 2019	-		16.417	Continuing	Continuing	-
		Subtotal	0.000	-		-		16.417		-		16.417	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FAB-T FET Other Support	Various	Various : Various, MA	0.000	-		-		10.220	Oct 2019	-		10.220	Continuing	Continuing	-
FAB-T FET A&AS	Various	Various : Various, MA	0.000	-		-		5.567	Oct 2019	-		5.567	Continuing	Continuing	-
		Subtotal	0.000	-		-		15.787		-		15.787	Continuing	Continuing	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	-		0.000		115.477		-		115.477	Continuing	Continuing	N/A

Remarks

In FY 2020, PE 1203001F, PE Family of Advanced Beyond Line-of-Sight Terminals, Project 673040, Force Element Terminal efforts were transferred from PE 1203001F, PE Family of Advanced Beyond Line-of-Sight Terminals, Project 672490, Family of Advanced Beyond Line of Sight Terminals.

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203001F / *Family of Advanced BLoS Terminals (FAB-T)*	**Project (Number/Name)** 673040 / *Force Element Terminal*

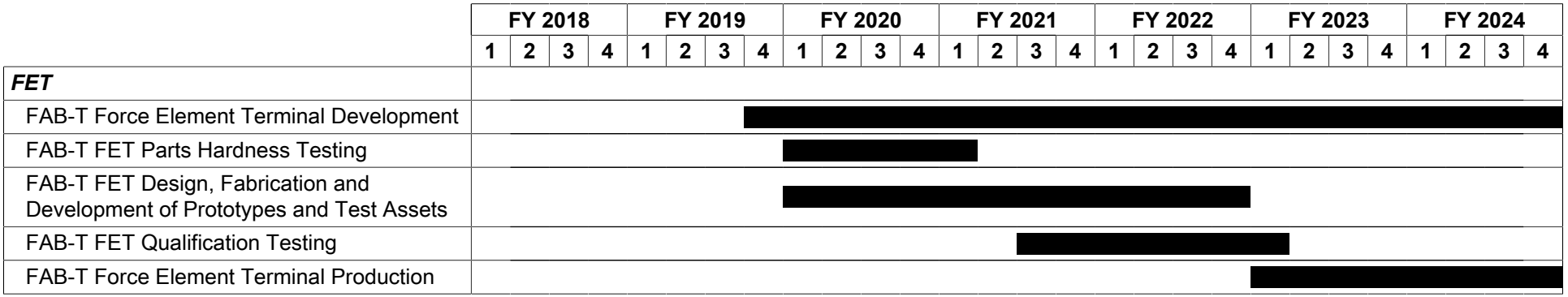

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203001F / *Family of Advanced BLoS Terminals (FAB-T)*	**Project (Number/Name)** 673040 / *Force Element Terminal*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
FET				
FAB-T Force Element Terminal Development	4	2019	4	2024
FAB-T FET Parts Hardness Testing	1	2020	1	2021
FAB-T FET Design, Fabrication and Development of Prototypes and Test Assets	1	2020	4	2022
FAB-T FET Qualification Testing	3	2021	1	2023
FAB-T Force Element Terminal Production	1	2023	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 1203110F / *Satellite Control Network (SPACE)*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	18.133	26.440	61.891	0.000	61.891	16.167	16.503	16.804	17.107	Continuing	Continuing
673276: *Satellite Control Network*	-	18.133	26.440	61.891	0.000	61.891	16.167	16.503	16.804	17.107	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Air Force Satellite Control Network (AFSCN) is a satellite ground terminal network comprised of two communication nodes (Schriever AFB & Vandenberg AFB) and 15 antenna systems. The antennas are distributed around the globe at seven locations -- Vandenberg Tracking Station (VTS), Diego Garcia Station (DGS), Guam Tracking Station (GTS), Hawaii Tracking Station (HTS), New Hampshire Tracking Station (NHS), Thule Tracking Station (TTS) and Telemetry and Commanding Station (TCS) at RAF Oakhanger, England -- to ensure global coverage for over 170 satellites in various orbits. The AFSCN conducts an average of 450 satellite contacts per day supporting Positioning, Navigation and Timing (PNT), Intelligence, Surveillance and Reconnaissance (ISR), Missile Warning, Communications, Weather, Launch Vehicle Support, and Research and Development (R&D) in support of Department of Defense (DoD), Intelligence Community (IC), and National Aeronautics and Space Administration (NASA) operations. While most of the 450 satellite contacts/day are routine command and control activities, the AFSCN is also used for satellite emergencies (e.g. tumbling satellite) because its high power antennas are often the only earthbound assets that can contact a non-responsive satellite to re-establish command & control. During FY 2018 the AFSCN supported 10 space vehicle emergencies resulting in the preservation of $3.6B worth of satellites. In addition to routine and emergency satellite operations C2, the AFSCN provides support to launch vehicle and early orbit operations, ensuring worldwide antennas receive telemetry as the rocket travels through the atmosphere and transmit commands to a newly orbiting satellite to initiate early orbit checkout. In FY 2018, the AFSCN supported 19 launches delivering $13.7B worth of satellites to their operational orbits. Finally, the AFSCN provides Factory Compatibility Testing (FCT) to ensure satellites and rockets can communicate via the AFSCN before the satellite is launched. These funds are used to develop next-generation tools to improve the AFSCN and ensure the capability is available to support DoD, Intelligence Community, and civil users. These efforts support cyber hardening, Defensive Cyberspace Operations (DCO-S) and and Systems Engineering & Integration (SE&I) activities for the space enterprise, as well as align with the evolving future space domain demands through Resilient Enterprise Ground (REG) to include transmit and receive, and data transport.

Remote Tracking Station (RTS) Block Change (RBC) - Satellite Anomaly Recovery and Support Upgrade; Enhanced High-Power Amplifier (EHPA): The Air Force will complete development testing of the EHPA first article. The AFSCN is in jeopardy of losing the emergency high power satellite contact capability due to obsolete parts used in the legacy AFSCN system. The EHPA program will develop a new high power amplifier that resolves the obsolescence issue through the 2020s.

AFSCN Deficiency Resolution: Provides test, cyber security, requirements management, and system architecture support to the AFSCN.

Resilient Enterprise Ground (REG): Provides the means to communicate with all future spacecraft through diverse antenna networks. The program is pursuing more capable ground based antennas, augmenting the existing ASFCN with commercial antennas, upgrading satellite scheduling to commercial standards, and cyber security.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203110F / *Satellite Control Network (SPACE)*

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

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

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	18.808	17.808	15.891	0.000	15.891
Current President's Budget	18.133	26.440	61.891	0.000	61.891
Total Adjustments	-0.675	8.632	46.000	0.000	46.000
• Congressional General Reductions	0.000	-1.368			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	10.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.675	0.000			
• Other Adjustments	0.000	0.000	46.000	0.000	46.000

Change Summary Explanation

FY19 Congressional add of $10M for Commercial Augmentation Services.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Remote Tracking Station (RTS) Block Change (RBC) - Satellite Anomaly Recovery and Support Upgrade; Enhanced High-Power Amplifier (EHPA):	1.191	0.000	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203110F / *Satellite Control Network (SPACE)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: RBC development replaces outdated, unique RTS equipment with standardized equipment and technology to reduce failures and enhance sustainability. Provides Advisory and Assistance Services (A&AS) to execute the RBC upgrade effort. Effort accomplished under Satellite Control Network Contract (SCNC). Developmental testing and fielding of first article occurred in FY 2018 to complete this effort. ***FY 2019 Plans:*** N/A ***FY 2020 Plans:*** N/A			
Title: AFSCN Deficiency Resolution ***Description:*** Provides test, cyber security, requirements management, and system architecture support to the AFSCN. Additionally, the Air Force is investigating multiple cyber defense tools for integration onto the AFSCN baseline. ***FY 2019 Plans:*** Address AFSCN deficiencies to the Remote Tracking Stations, Enhanced High Power Amplifiers, AFSCN Scheduling System and other infrastructure. ***FY 2020 Plans:*** Address AFSCN deficiencies in the Remote Tracking Stations, Enhanced High Power Amplifiers, AFSCN Scheduling System and other infrastructure. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 increased compared to FY 2019 by $0.342M. Justification for this increase is described in plans above.	0.642	0.453	0.795
Title: Satellite Operations Transmit and Receive ***Description:*** Provide enterprise transmit, receive and resource management solutions to enable continuous satellite operations (SATOPS) during contested, degraded and operationally denied environment. Not a new start, identified as Resilient Enterprise Ground major thrust in FY 2019. ***FY 2019 Plans:*** Begin risk reduction and technology maturation activities in pursuit of more capable ground infrastructure to include but not limited to ground based apertures, augmenting the existing AFSCN with commercial apertures and developing ground resource management tools. Award Commercial Augmentation Services integration contract (Congressional add). Fund Multi-Band Multi-	13.527	21.637	10.513

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203110F / *Satellite Control Network (SPACE)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Mission antenna prototyping to meet AFSCN and Launch and Test Range System (LTRS) requirements. Funds will also be contributed from the LTRS PE 1203182F. ***FY 2020 Plans:*** Award development contract for phased array Multi-Band Multi-Mission antennas. Complete Commercial Augmentation Services integration activities. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 decreased compared to FY 2019 by $11.124M. Justification for this decrease is described in plans above.			
Title: Defensive Cyberspace Operations - Space (DCO-S) ***Description:*** Funding supports cyber hardening and Defensive Cyberspace Operations for Space (DCO-S) activities for the space enterprise. Provides space enterprise defensive cyber solutions to counter advanced persistence cyber threats, through rapid fielding of operational prototypes using DevSecOps methods. This is not a new start. This effort initially started under each of the AFSCN major thrusts has evolved into a space enterprise-wide effort and consequently is being broken out as a separate major thrust to provide additional efficiency and transparency. This effort implements a combined Development/Operations (DEVOPS) framework which incorporates methodologies, technologies, and tools to deeply embed security best practices into the modern development workflow and toolchain. This effort will institute four product lines: Manticore (detect), Pegasus (protect), Chimera (identify), and Kraken (respond). The DCO-S capabilities are developed and deployed as an agile program, leveraging a DEVOPS framework to facilitate rapid and timely fielding to operations. ***FY 2019 Plans:*** N/A ***FY 2020 Plans:*** Continue to enhance Defensive Cyber Operations for Space (DCO-S) enterprise-wide, through development and integration of Defensive Cyber Operations tools, including Manticore, Pegasus, Chimera, and Kraken product lines. Manticore will continue to develop, integrate and field endpoint and network data collection, and data extraction and fusion analytic capabilities. Pegasus will continue to address hardware and software supply chain risk management (HW/SW SCRM), enterprise crypography, and cyber hardening activities. Chimera will continue to develop threat identification through system characterization, vulnerability mapping, and cyber/intelligence integration. Kraken will continue to develop capability for incident management, forensics, and tailored response. Collectively these tool capabilities will fill cyber deficiencies access the space enterprise.	-	0.000	46.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203110F / *Satellite Control Network (SPACE)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Continue to plan and deploy DCO-S product line capabilities to the following mission systems: AFSCN, GPS (OCS), and AEHF, Enterprise Ground Services (EGS), REG, and Eastern/Western Ranges. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 increased compared to FY 2019 by $46M. Justification for this increase is described in plans above.			
Title: Enterprise Systems Engineering and Integration ***Description:*** SE&I manages the government controlled system and subsystem level baseline requirements including analysis of future changes to the fielded baseline. SE&I provides "government as the integrator" engineering support to ensure multiple separate modernizations and the sustainment baseline are synchronized. SE&I will develop and recommend investment strategies to keep the AFSCN operating well beyond the FYDP. ***FY 2019 Plans:*** Continue Program Office support and independent SE&I efforts as required to integrate modernization and sustainment efforts into future sites. Provide systems and subsystem level definition, baseline, architecture, integration planning and support for the AFSCN. Additionally, SE&I will provide support to Space & Missile Systems Center (SMC) initiatives such as logistics and sustainment planning for EGS. ***FY 2020 Plans:*** Continue Program Office support and independent SE&I efforts as required to integrate development and modernization across the AFSCN. Provide systems and subsystem level definition, baseline, architecture, integration planning and support for the AFSCN. Additionally, SE&I will provide support to Space & Missile Systems Center (SMC) initiatives supporting Resilient Enterprise Ground activities. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 increased compared to FY 2019 by $0.233M. Justification for this increase is described in plans above.	2.773	4.350	4.583
Accomplishments/Planned Programs Subtotals	18.133	26.440	61.891

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• SPAF 01 Line Item AFSCOM: *AF Satellite Comm System*	47.148	35.400	56.298	-	56.298	48.376	49.359	50.284	51.188	Continuing	Continuing
• RDTE 07 1203182F: *Spacelift Range System (SPACE)*	20.035	20.168	10.837	-	10.837	11.023	11.253	11.459	10.989	Continuing	Continuing

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203110F / *Satellite Control Network (SPACE)*

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost

Remarks

Procures the mission critical electronics and telecommunications equipment to upgrade the aging AFSCN Range and Network Operations segments.

E. Acquisition Strategy

RDT&E efforts focus on completing upgrades as well as future architectures and studies to ensure the best use of investment funding. The SE&I contractor maintains the DoD Architecture Framework (DoDAF) architecture and requirements baseline for Government approval and may perform studies to determine Government options. Limited RDT&E will be applied to the Consolidated Air Force Satellite Control Network (AFSCN) Modifications, Maintenance, and Operations (CAMMO) contract when sustaining engineering expertise is needed to finalize Government-approved architectures. FFRDC technical depth and breadth will be leveraged to ensure AFSCN modernization efforts are compatible with mission rules and do not pose a risk to safe and cost-effective satellite contacts.

Resilient Enterprise Ground (REG) activities will leverage existing prototypes and risk reduction activities. The Air Force plans to pursue the use of FY2016 National Defense Authorization Act section 804, Middle Tier Rapid Prototyping and section 815, Other Transaction Authority for Resilient Enterprise Ground.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203110F / *Satellite Control Network (SPACE)*	Project (Number/Name) 673276 / *Satellite Control Network*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Satellite Control Network Contract (SCNC)	Various	KBR Wylie : Colorado Springs, CO	-	1.191	Oct 2017	-		-		-		-	0.000	1.191	-
Resilient Enterprise Ground Scheduling	Various	Braxton, Stottler-Henke : Colorado Springs, CO	-	6.199		4.652		2.000		-		2.000	Continuing	Continuing	-
AFSCN Deficiency Resolution	Various	Various : Colorado Springs, CO	-	0.642		0.453		2.740		-		2.740	Continuing	Continuing	-
Resilient Enterprise Ground (REG) Commercial Augmentation	MIPR	AFRL : Kirtland AFB, NM	-	-		10.000	Apr 2019	-		-		-	Continuing	Continuing	-
Resilient Enterprise Ground Multi-Band Multi-Mission	MIPR	DIU : Mountain View, CA	-	5.000	Mar 2019	4.195		3.429		-		3.429	Continuing	Continuing	-
Defensive Cyberspace Operations - Space (DCO-S)	Various	TBD : Colorado Springs	-	-		-		46.000		-		46.000	Continuing	Continuing	-
Enterprise Systems Engineering and Integration	C/CPIF	ENSCO : Colorado Springs, CO	-	2.773	Nov 2017	4.350	Nov 2018	4.583	Nov 2019	-		4.583	Continuing	Continuing	-
Technical Mission Analysis	RO	Aerospace Corp : El Segundo, CA	-	1.336	Oct 2017	1.376	Oct 2018	1.417	Oct 2019	-		1.417	Continuing	Continuing	-
		Subtotal	-	17.141		25.026		60.169		-		60.169	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FFRDC, A&AS	Various	Aerospace Corp, Gartner : El Segundo, CA	-	0.992		1.414		1.722		-		1.722	Continuing	Continuing	-
		Subtotal	-	0.992		1.414		1.722		-		1.722	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203110F / *Satellite Control Network (SPACE)*	Project (Number/Name) 673276 / *Satellite Control Network*	

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	18.133		26.440		61.891		-		61.891	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203110F / *Satellite Control Network (SPACE)*	**Project (Number/Name)** 673276 / *Satellite Control Network*

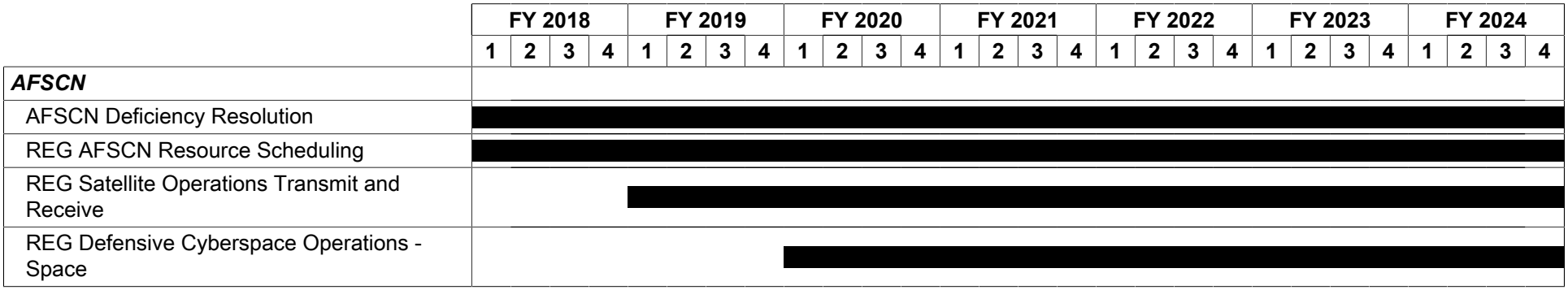

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203110F / *Satellite Control Network (SPACE)*	**Project (Number/Name)** 673276 / *Satellite Control Network*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
AFSCN				
AFSCN Deficiency Resolution	1	2018	4	2024
REG AFSCN Resource Scheduling	1	2018	4	2024
REG Satellite Operations Transmit and Receive	1	2019	4	2024
REG Defensive Cyberspace Operations - Space	1	2020	4	2024

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203165F / *NAVSTAR Global Positioning System (Space and Control Segments)*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	7.681	8.937	0.000	0.000	0.000	1.985	1.991	2.027	2.063	Continuing	Continuing
67A025: *GPS Enterprise Integrator*	-	7.681	8.937	0.000	0.000	0.000	1.985	1.991	2.027	2.063	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Detailed information on this effort remains classified and will be provided on a need-to-know basis.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	10.029	8.937	1.986	0.000	1.986
Current President's Budget	7.681	8.937	0.000	0.000	0.000
Total Adjustments	-2.348	0.000	-1.986	0.000	-1.986
• Congressional General Reductions	-2.018	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	-0.330	0.000			
• Other Adjustments	0.000	0.000	-1.986	0.000	-1.986

Change Summary Explanation

FY 2020: $1.986M transferred to higher Air Force Space priorities.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Classified Effort	7.681	8.937	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203165F / *NAVSTAR Global Positioning System (Space and Control Segments)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: Classified effort ***FY 2019 Plans:*** Classified effort ***FY 2020 Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	7.681	8.937	0.000

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

N/A

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203165F / *NAVSTAR Global Positioning System (Space and Control Segments)*	Project (Number/Name) 67A025 / *GPS Enterprise Integrator*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Classified Effort	TBD	TBD : TBD	-	7.681	Oct 2017	8.937	Oct 2018	0.000		-		0.000	Continuing	Continuing	-
		Subtotal	-	7.681		8.937		0.000		-		0.000	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	7.681		8.937		0.000		-		0.000	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203165F / *NAVSTAR Global Positioning System (Space and Control Segments)*	**Project (Number/Name)** 67A025 / *GPS Enterprise Integrator*

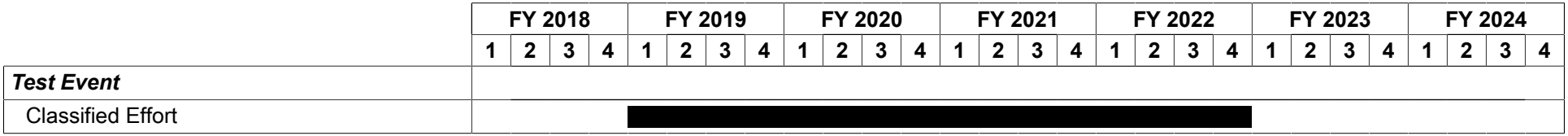

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203165F / *NAVSTAR Global Positioning System (Space and Control Segments)*	**Project (Number/Name)** 67A025 / *GPS Enterprise Integrator*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Test Event				
Classified Effort	1	2019	4	2022

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 1203173F / *Space and Missile Test and Evaluation Center*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	43.715	79.935	4.566	0.000	4.566	4.398	4.014	4.086	4.159	Continuing	Continuing
67A014: *R&D Space & Missile Operations*	-	43.715	2.626	4.566	0.000	4.566	4.398	4.014	4.086	4.159	Continuing	Continuing
673140: *Enterprise Ground Services EGS*	-	0.000	77.309	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Note

In FY 2020 and beyond, the Enterprise Ground Services (EGS) Project 673140 has been transferred to a dedicated Program Element (1206770F).

A. Mission Description and Budget Item Justification

The Research and Development Space and Missile Operations (RDSMO) program, executed by the Advanced Systems and Development Directorate at Kirtland AFB, NM, conducts space and missile Research and Developmental Test and Evaluation (RDT&E) and Initial Operational Test and Evaluation (IOT&E) in support of prototype experimental, demonstration, and operational satellites at the RDT&E Support Complex (RSC) and the Mobile Range Flight (MRF) at Kirtland, NM and at Schriever AFB, CO. The RDSMO program develops, acquires, delivers, integrates, tests, operates and sustains the Multi-Mission Satellite Operations Center (MMSOC) satellite command and control (C2) Ground System Enterprise (GSE) and fixed/deployable telemetry, tracking, and commanding (TT&C) antenna systems in support of AF and DoD missions. The RDSMO program is responsible for transitions of designated satellite missions to the operational command upon user needs. In addition, RDSMO supports the deployment and sustainment of Enterprise Ground Services (EGS) in multiple locations as AFSPC transitions to an Enterprise-based ground C2. Funds in the General Information Technology (Space) line procures Information Technology products to support RDSMO.

The primary objective of the MMSOC C2/GSE environment is to develop the capability to rapidly support R&D, prototype and operational systems and to transition R&D space vehicle technology with residual military utility to operational status for immediate warfighter support. MMSOC is a multiple mission operation system that uses standard hardware and software infrastructure to (1) perform satellite C2 in support of launch requirements; (2) develop and test tactics, techniques, procedures and concepts to conduct satellite operations;(3) provide a satellite C2 incremental block evolution resource for RDT&E of new satellite and C2 systems and concepts; and (4) deliver operational flexibility for new and legacy satellite missions. A secondary objective of MMSOC is to provide a foundational C2 platform and product line for the Enterprise Ground Services (EGS) effort to build upon and to meet the evolving initiatives of the current and future space enterprise.

This program previously contained the EGS project as part of the evolving current and future space domain. MMSOC capability will transition to become the EGS C2 product line. The EGS C2 product line will perform technology maturation, experiments, prototyping and operational mission transition for increased commonality and resiliency in space program ground systems. The RDSMO program will continue to support all mission sets described above as the EGS capability becomes the primary ground C2 system for AFSPC and other users.

Space acquisition must respond with speed and agility to emerging adversary threats. Space & Missile Systems Center (SMC) is transforming the organization and implementation of space acquisition to an enterprise approach, maximizing innovation and resiliency, leveraging international, commercial, and mission partnerships,

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203173F / *Space and Missile Test and Evaluation Center*

and managing program/project priorities according to an integrated unclassified/classified enterprise space architecture. Expanding the appropriate acquisition authorities and contract mechanisms to deliver capability sooner, SMC will strategically execute experimentation, prototyping, risk reduction, and other efforts to develop new or repurpose capabilities.

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

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	25.051	59.935	34.343	0.000	34.343
Current President's Budget	43.715	79.935	4.566	0.000	4.566
Total Adjustments	18.664	20.000	-29.777	0.000	-29.777
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	20.000	20.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-1.336	0.000			
• Other Adjustments	0.000	0.000	-29.777	0.000	-29.777

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2018	FY 2019
Project: 67A014: *R&D Space & Missile Operations*		
Congressional Add: *Space Enterprise Defense Implementation*	19.407	-
Congressional Add Subtotals for Project: 67A014	19.407	-
Project: 673140: *Enterprise Ground Services EGS*		
Congressional Add: *Space Enterprise Defense Implementation*	-	20.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203173F / *Space and Missile Test and Evaluation Center*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2018	FY 2019
Congressional Add Subtotals for Project: 673140	-	20.000
Congressional Add Totals for all Projects	19.407	20.000

Change Summary Explanation

FY 2020: Decrease of $29.77M, funding transferred to the EGS project (673140). EGS has been established as a separate PE (1206770F) for FY2020 and beyond. EGS project total for FY2020 is $138.870M to support the increase in mission on-boarding to meet requirements.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203173F / *Space and Missile Test and Evaluation Center*	Project (Number/Name) 67A014 / *R&D Space & Missile Operations*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
67A014: *R&D Space & Missile Operations*	-	43.715	2.626	4.566	0.000	4.566	4.398	4.014	4.086	4.159	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Research and Development Space and Missile Operations (RDSMO) program, executed by the Advanced Systems and Development Directorate at Kirtland AFB, NM, conducts space and missile Research and Developmental Test and Evaluation (RDT&E) and Initial Operational Test and Evaluation (IOT&E) in support of prototype experimental, demonstration, and operational satellites at the RDT&E Support Complex (RSC) and the Mobile Range Flight (MRF) at Kirtland, NM and at Schriever AFB, CO. The RDSMO program develops, acquires, delivers, integrates, tests, operates and sustains the Multi-Mission Satellite Operations Center (MMSOC) satellite command and control (C2) Ground System Enterprise (GSE) and fixed/deployable telemetry, tracking, and commanding (TT&C) antenna systems in support of AF and DoD missions. The RDSMO program is responsible transitions for designated satellite missions to the operational command upon user needs. In addition, RDSMO supports the deployment and sustainment of Enterprise Ground Services (EGS) in multiple locations as AFSPC transitions to an Enterprise-based ground C2. Funds in the General Information Technology (Space) line procures Information Technology products to support RDSMO.

The primary objective of the MMSOC C2/GSE environment is to develop the capability to rapidly support R&D, prototype and operational systems and to transition R&D space vehicle technology with residual military utility to operational status for immediate warfighter support. MMSOC is a multiple mission operation system that uses standard hardware and software infrastructure to (1) perform satellite C2 in support of launch requirements; (2) develop and test tactics, techniques, procedures and concepts to conduct satellite operations;(3) provide a satellite C2 incremental block evolution resource for RDT&E of new satellite and C2 systems and concepts; and (4) deliver operational flexibility for new and legacy satellite missions. A secondary objective of MMSOC is to provide a foundational C2 platform and product line for the Enterprise Ground Services (EGS) effort to build upon and to meet the evolving initiatives of the current and future space enterprise.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: MMSOC Development	3.967	2.626	4.566
Description: Multi-Mission Satellite Operations Center (MMSOC) development/integration/test. ***FY 2019 Plans:*** Continue providing capability to AFSPC for reduced cost of operations and maintenance through evolution of MMSOC C2 architecture and automated processes and integrate EGS backwards functionality into MMSOC. Support ORS-5 MMSOC 2.1 Ground System Sustainment at Schriever AFB. Transition Air Force Research Laboratory (AFRL)'s Evolved Expendable Launch Vehicle (EELV) Secondary Payload Adapter (ESPA) Augmented Geostationary Laboratory Experiment (EAGLE) and Mycroft Missions from Kirtland AFB to Schriever AFB.			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203173F / *Space and Missile Test and Evaluation Center*	**Project (Number/Name)** 67A014 / *R&D Space & Missile Operations*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Transition all missions from the MMSOC 2.0 baseline to the 2.1 baseline. Decommission and dispose of the MMSOC 2.0 baseline. Onboard Long Duration Propulsive ESPA (LDPE)-1 mission C2 and provide backup to EGS mission schedule. Continue program office support and other related support activities. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, prototyping, etc. ***FY 2020 Plans:*** Continue providing capability to AFSPC for reduced cost of operations and maintenance through evolution of MMSOC C2 architecture and automated processes and integrate EGS backwards functionality into MMSOC C2. Decommission and dispose of thes MMSOC 2.0 baseline. Continue LDPE-1 mission C2 and provide backup to EGS mission schedule. Begin support to the AFSPC-12 payload, Navigation Technology Satellite 3 (NTS-3) and Tetra prototyping projects. Continue program office support and other related support activities. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, prototyping, etc. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 increase compared to FY 2019 by $1.941M. The program will continue to mature the MMSOC C2 architecture and add automated processes and integrate EGS functionalities.			
Title: Enterprise Ground Services (EGS)	20.341	0.000	0.000
Description: Enterprise Ground Services (EGS) provides the Air Force with a robust enterprise ground architecture by creating a set of government standards and interfaces to flexibly manage and execute integrated and agile satellite operations (SATOPS) in a contested environment. EGS provides the complete operations solution for SATOPS at various classification levels with increased resiliency and capability, and improved cyber defense capabilities. EGS will enable a near-real-time common operating picture of enterprise-wide tactical health, status and indications, and warnings for Air Force satellites. The end-state will be a modern technical infrastructure which is cyber- secure and resilient against the Advanced Persistent Threat and employs streamlined architecting, acquisition, and operational processes. EGS operates as a key element of the current and future space domain, and leverages lessons learned, contracts and resources from the other elements of the Enterprise Space Battle Management Command and Control (ESBMC2) and Threat Warning and Response (TWAR). ***FY 2019 Plans:*** N/A ***FY 2020 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203173F / *Space and Missile Test and Evaluation Center*	**Project (Number/Name)** 67A014 / *R&D Space & Missile Operations*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	24.308	2.626	4.566

	FY 2018	FY 2019
Congressional Add: Space Enterprise Defense Implementation	19.407	-
FY 2018 Accomplishments: The FY 2018 Congressional Add funds, less $0.593 million SBIR transfer, were used to procure the initial EGS prototypes that built on the successful EGS demonstration of STPSat-2 in February 2018. The infrastructure supports multiple satellite missions at multiple classification levels and includes the initial delivery of a cyber monitoring capability to support defensive cyber operations. In addition to the infrastructure, EGS expanded its agile development scrum teams to provide cyber security, automation, coding, and established a development-to-operations pipeline so that EGS will be able to on-board at least 4 satellites/payloads in FY19.		
Congressional Adds Subtotals	19.407	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPAF 03 834010 / 1203173F: *General Information Technology*	1.964	-	-	-	-	-	-	-	-	Continuing	Continuing
• SPAF 01 BP23 GNRLIT / 1203173F: *General Information Technology*	-	1.361	1.894	-	1.894	1.928	1.964	2.001	2.037	Continuing	Continuing

Remarks

This effort was recategorized from appropriation 3080, Other Procurement Air Force (OPAF) to appropriation 3021, Space Procurement Air Force (SPAF) for FY 2019 and beyond, and is described in the SPAF P-1, BP23, GNRLIT, General Information Technology.

D. Acquisition Strategy

To modernize and sustain MMSOC; and to procure, integrate, and test EGS prototypes for the SBIRS, ORS-5, LDPE, EAGLE, Mycroft, AFSPC-12 payload, NTS-3 and Tetra prototyping projects, the Air Force is competitively awarding a new Engineering, Development, Integration, and Sustainment (EDIS) Contract to replace the existing Engineering, Development, and Sustainment (EDS) Follow-On Contract in support of MMSOC, MRF and EGS activities. Additionally, MMSOC is using a

competitively awarded Space Test and Engineering Contract (STEC), and utilize Advisory & Assistance Support (A&AS) contract. These contracts are all managed by Space and Missile Systems Center (SMC).

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203173F / *Space and Missile Test and Evaluation Center*	**Project (Number/Name)** 67A014 / *R&D Space & Missile Operations*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering, Development, and Sustainment (EDS) Follow-on Contract Bridge (MMSOC)	C/CPAF	Lockheed Martin : Santa Maria, CA	-	1.532	Oct 2017	1.137	Jan 2019	-		-		-	Continuing	Continuing	-
Engineering, Development, Integration, and Sustainment (EDIS) Contract	C/FFP	TBD : TBD, NM	-	-		0.467	Jan 2019	1.449	Oct 2019	-		1.449	Continuing	Continuing	-
Neptune Common Ground Architecture	MIPR	Naval Research Lab : Washington, DC	-	1.030	Oct 2017	0.250	Oct 2018	1.100	Nov 2019	-		1.100	Continuing	Continuing	-
Service Bus Architecture Standards	MIPR	NASA Goddard : Greenbelt, MD	-	0.050	Oct 2017	0.050	May 2019	0.050	May 2020	-		0.050	Continuing	Continuing	-
Information Assurance-ISSE (MMSOC)	MIPR	SAF/FMBIB : Albuquerque, NM	-	0.120	Jan 2018	0.120	Jan 2019	0.250	Jan 2020	-		0.250	Continuing	Continuing	-
Enterprise Ground Services (EGS)	Various	Various : CA	-	39.748	Jan 2018	0.000		0.000		-		0.000	Continuing	Continuing	-
		Subtotal	-	42.480		2.024		2.849		-		2.849	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Space Test and Engineering Contract (STEC) (MMSOC)	C/CPAF	LINQUEST : Kirtland, AFB, NM	-	0.498	Oct 2017	0.256	Nov 2018	0.400	Nov 2019	-		0.400	Continuing	Continuing	-
		Subtotal	-	0.498		0.256		0.400		-		0.400	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203173F / *Space and Missile Test and Evaluation Center*	Project (Number/Name) 67A014 / *R&D Space & Missile Operations*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
A&AS- METIS	Various	Various : Kirtand, AFB, NM	-	0.737	Oct 2017	0.346	Mar 2019	1.317	Mar 2020	-		1.317	Continuing	Continuing	-
		Subtotal	-	0.737		0.346		1.317		-		1.317	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	43.715		2.626		4.566		-		4.566	Continuing	Continuing	N/A

Remarks

The costs for EGS for FY 2019 are under the EGS project (673140) within this program. The costs for EGS for FY 2020 are under the new EGS program (1206770F).

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203173F / *Space and Missile Test and Evaluation Center*	**Project (Number/Name)** 67A014 / *R&D Space & Missile Operations*

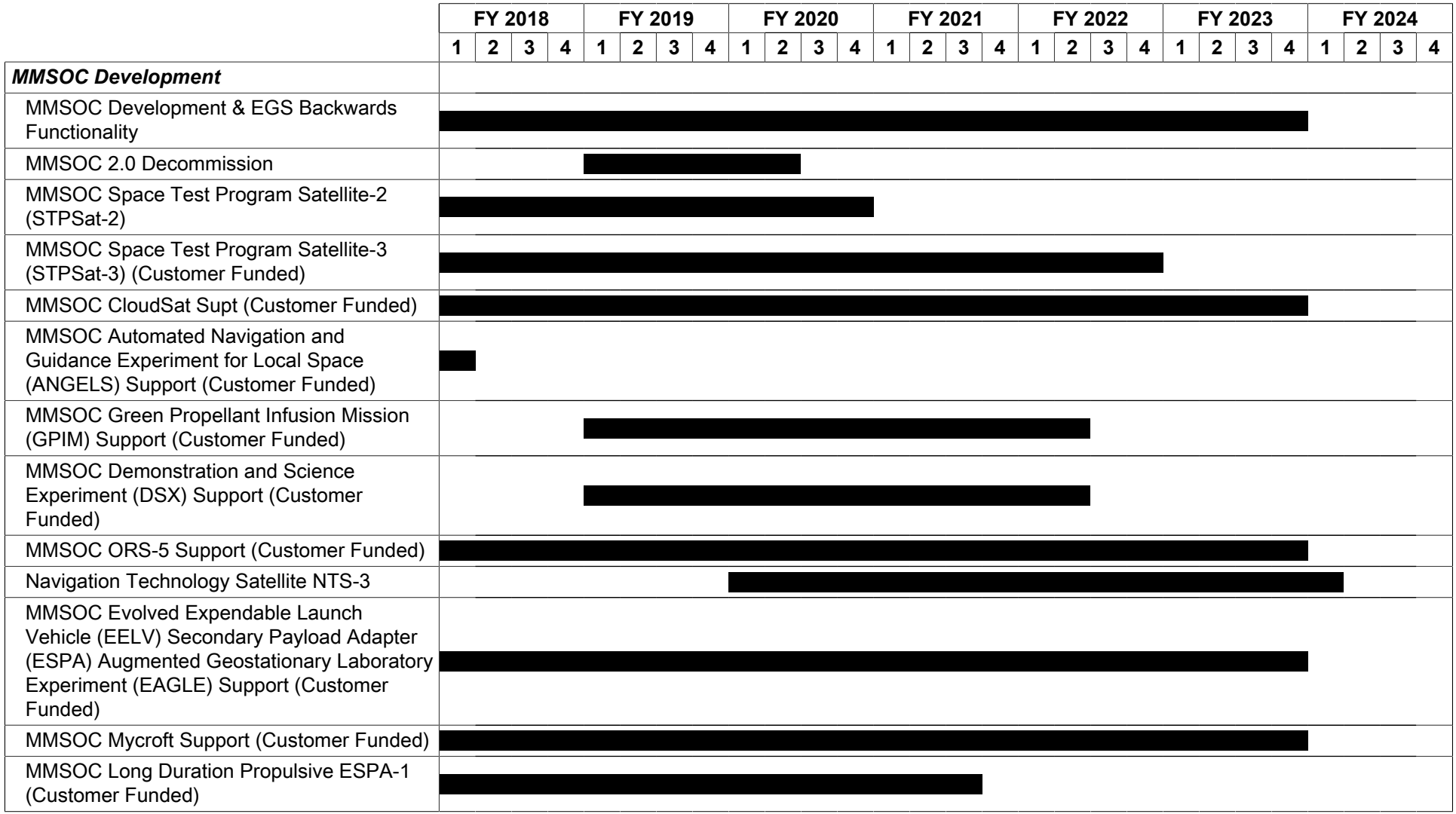

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203173F / *Space and Missile Test and Evaluation Center*	**Project (Number/Name)** 67A014 / *R&D Space & Missile Operations*

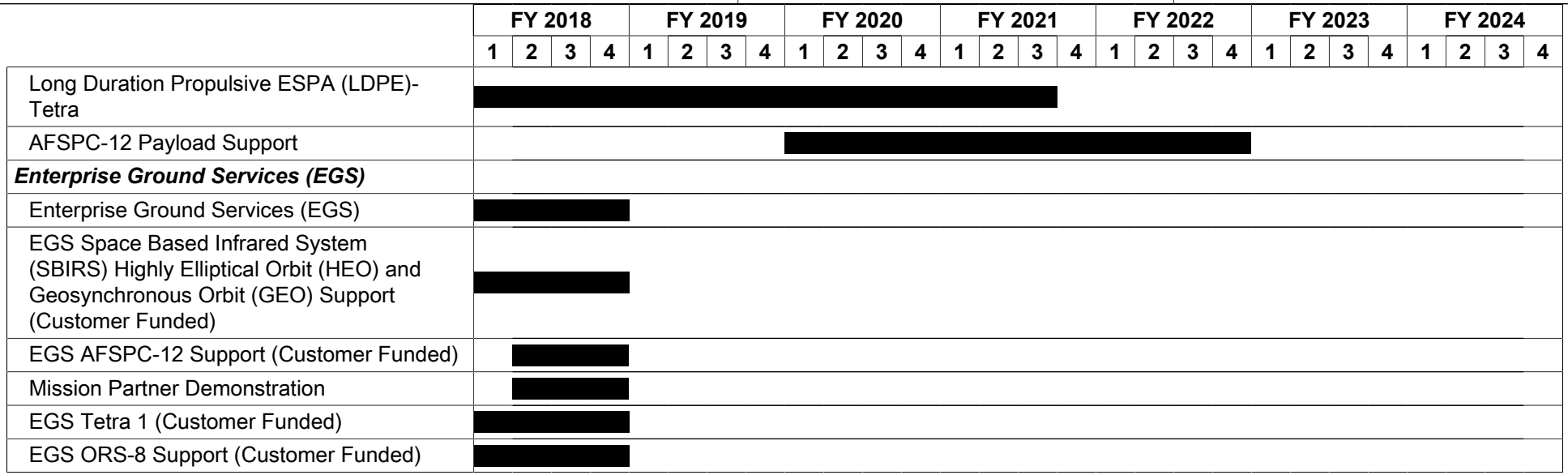

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203173F / *Space and Missile Test and Evaluation Center*	**Project (Number/Name)** 67A014 / *R&D Space & Missile Operations*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
MMSOC Development				
MMSOC Development & EGS Backwards Functionality	1	2018	4	2023
MMSOC 2.0 Decommission	1	2019	2	2020
MMSOC Space Test Program Satellite-2 (STPSat-2)	1	2018	4	2020
MMSOC Space Test Program Satellite-3 (STPSat-3) (Customer Funded)	1	2018	4	2022
MMSOC CloudSat Supt (Customer Funded)	1	2018	4	2023
MMSOC Automated Navigation and Guidance Experiment for Local Space (ANGELS) Support (Customer Funded)	1	2018	1	2018
MMSOC Green Propellant Infusion Mission (GPIM) Support (Customer Funded)	1	2019	2	2022
MMSOC Demonstration and Science Experiment (DSX) Support (Customer Funded)	1	2019	2	2022
MMSOC ORS-5 Support (Customer Funded)	1	2018	4	2023
Navigation Technology Satellite NTS-3	1	2020	1	2024
MMSOC Evolved Expendable Launch Vehicle (EELV) Secondary Payload Adapter (ESPA) Augmented Geostationary Laboratory Experiment (EAGLE) Support (Customer Funded)	1	2018	4	2023
MMSOC Mycroft Support (Customer Funded)	1	2018	4	2023
MMSOC Long Duration Propulsive ESPA-1 (Customer Funded)	1	2018	3	2021
Long Duration Propulsive ESPA (LDPE)- Tetra	1	2018	3	2021
AFSPC-12 Payload Support	1	2020	4	2022
Enterprise Ground Services (EGS)				
Enterprise Ground Services (EGS)	1	2018	4	2018
EGS Space Based Infrared System (SBIRS) Highly Elliptical Orbit (HEO) and Geosynchronous Orbit (GEO) Support (Customer Funded)	1	2018	4	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203173F / *Space and Missile Test and Evaluation Center*	**Project (Number/Name)** 67A014 / *R&D Space & Missile Operations*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
EGS AFSPC-12 Support (Customer Funded)	2	2018	4	2018
Mission Partner Demonstration	2	2018	4	2018
EGS Tetra 1 (Customer Funded)	1	2018	4	2018
EGS ORS-8 Support (Customer Funded)	1	2018	4	2018

Note

Note: This schedule reflects RDSMO support to the customer funded missions and may not directly align with customer program office schedules.

The schedule for EGS for FY 2019 is under the EGS project (673140) within this program. The schedule for EGS for FY 2020 is under the new EGS program (1206770F).

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203173F / *Space and Missile Test and Evaluation Center*	Project (Number/Name) 673140 / *Enterprise Ground Services EGS*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
673140: *Enterprise Ground Services EGS*	-	0.000	77.309	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In FY 2020 and beyond, the Enterprise Ground Services (EGS) Project 673140 has been transferred to a dedicated Program Element (1206770F).

The Enterprise Ground Services (EGS) program is part of the evolving current and future space domain demands. MMSOC capability will transition to become the EGS command and control (C2) product line. The EGS C2 product line will perform technology maturation, experiments, prototyping and operational mission transition for increased commonality and resiliency in space program ground systems. The EGS capability will become the primary ground C2 system for AFSPC and other users.

The main objective of the EGS is to provide a robust enterprise ground architecture for Air Force space systems. EGS will focus efforts on developing and integrating data centers in laboratories at three separate sites, advanced concept exploration, prototype development and demonstrations, user experience maturation, training and Concept of Operations (CONOPS) refinement, cyber operations and operational mission training support. These efforts will require support such as systems engineering, integration and test, standards and interface development, architecture development, enhanced cybersecurity development and implementation.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Enterprise Ground Services (EGS)	-	57.309	0.000

Description: Enterprise Ground Services (EGS) provides the Air Force with a robust enterprise ground architecture by creating a set of government standards and interfaces to flexibly manage and execute integrated and agile satellite operations (SATOPS) in a contested environment. EGS provides the complete operations solution for SATOPS at various classification levels with increased resiliency and capability, and improved cyber defense capabilities. EGS will enable a near-real-time common operating picture of enterprise-wide tactical health, status and indications, and warnings for Air Force satellites. The end-state will be a modern technical infrastructure which is cyber- secure and resilient against the Advanced Persistent Threat and employs streamlined architecting, acquisition, and operational processes. EGS operates as a key element of the current and future space domain, and leverages lessons learned, contracts and resources from the other elements of the Enterprise Space Battle Management Command and Control (ESBMC2) and Threat Warning and Response (TWAR).

FY 2019 Plans:

Continue to enhance MMSOC capabilities in support of ongoing missions as EGS C2 matures and continue to develop the prototype capabilities and sustain for a robust enterprise ground architecture. Continue developing the programmatic, technical, and architectural roadmap to enable the phased transition of mission partners to EGS. Continue maturation of EGS laboratories,

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203173F / *Space and Missile Test and Evaluation Center*	**Project (Number/Name)** 673140 / *Enterprise Ground Services EGS*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
data centers, networks, and links. Continue prototype Mission Partner Demonstrations. Continue transition planning and prototype development to include but not limited to the SBIRS Geosynchronous Earth Orbit (GEO) satellite systems, EGS AFSPC-12 Support, Weather System Follow-on-Microwave, Tetra 1-3, ORS-8, and Long Duration Propulsive ESPA-2 vehicles. Continue cybersecurity development and implementation, standards and interface refinement, training and CONOPS refinement, advanced concept maturation, integration and test of mission unique software, and integration of common applications and services, Integrated Product Support, and integration efforts with current and future space domain capabilities. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, prototyping, etc. ***FY 2020 Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	-	57.309	0.000

	FY 2018	FY 2019
Congressional Add: Space Enterprise Defense Implementation	-	20.000
FY 2019 Plans: The Congressional Add supports EGS expanding on the prototypes to scale services to support more missions. The funds will be used to develop and to field operational services consistent with incremental deliveries and agile development. Specific areas include: adding additional software developers, documenting development for mission partners to enable adoption of EGS services, transitioning services into an operational environment to prototype agile Ops Acceptance of individual services, and increased accreditation and security support to the project office.		
Congressional Adds Subtotals	-	20.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• RDTE 07 1206770F: *Enterprise Ground Services*	-	-	138.870	-	138.870	116.830	194.090	165.500	158.320	Continuing	Continuing

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203173F / *Space and Missile Test and Evaluation Center*	**Project (Number/Name)** 673140 / *Enterprise Ground Services EGS*

D. Acquisition Strategy

The EGS acquisition strategy focuses on rapidly delivering C2 prototypes and operational capabilities to warfighters, while leveraging industry best practices for agile development and continuous integration /deliver (CI/CD). One of the key tenets of the EGS acquisition strategy is to maintain government ownership of the technical baseline. As a result, EGS uses a combination of existing and new contracts, and agreements with industry and academia to procure prototypes, platform as a service (PaaS) capabilities, system engineering services, and pre-operations support for mission users. Leverage existing contracts in FY19 and continue consolidation of contracts into FY 2020.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203173F / *Space and Missile Test and Evaluation Center*	Project (Number/Name) 673140 / *Enterprise Ground Services EGS*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Pre-Ops Support	Various	Various : Various	-	-		8.573	Jan 2019	-		-		-	Continuing	Continuing	-
H/W, S/W and Integration	Various	Various : TBD	-	-		16.374	Dec 2018	-		-		-	Continuing	Continuing	-
Technical Mission Analysis (FFRDC Aerospace Direct Costs)	MIPR	Aerospace : El Segundo, CA	-	-		3.420	Nov 2018	-		-		-	Continuing	Continuing	-
Development	Various	Various : TBD	-	-		26.867	Dec 2018	-		-		-	Continuing	Continuing	-
Space Engineering & Integration	Various	Various : Various	-	-		12.568	Nov 2018	-		-		-	Continuing	Continuing	-
		Subtotal	-	-		67.802		-		-		-	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FFRDC (Aerospace)	MIPR	Aerospace : Los Angeles, CA	-	-		2.361	Oct 2018	-		-		-	Continuing	Continuing	-
Other	Various	Various : Los Angeles, CA	-	-		0.400	Oct 2018	-		-		-	Continuing	Continuing	-
A&AS Support	Various	Various : Los Angeles, CA	-	-		6.746	Oct 2018	-		-		-	Continuing	Continuing	-
		Subtotal	-	-		9.507		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		77.309		-		-		-	Continuing	Continuing	N/A

Remarks

The costs for EGS for FY2018 are under the RDSMO project (67A014) within this program. The costs for EGS for FY 2020 are under the new EGS program (1206770F).

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203173F / *Space and Missile Test and Evaluation Center*	**Project (Number/Name)** 673140 / *Enterprise Ground Services EGS*

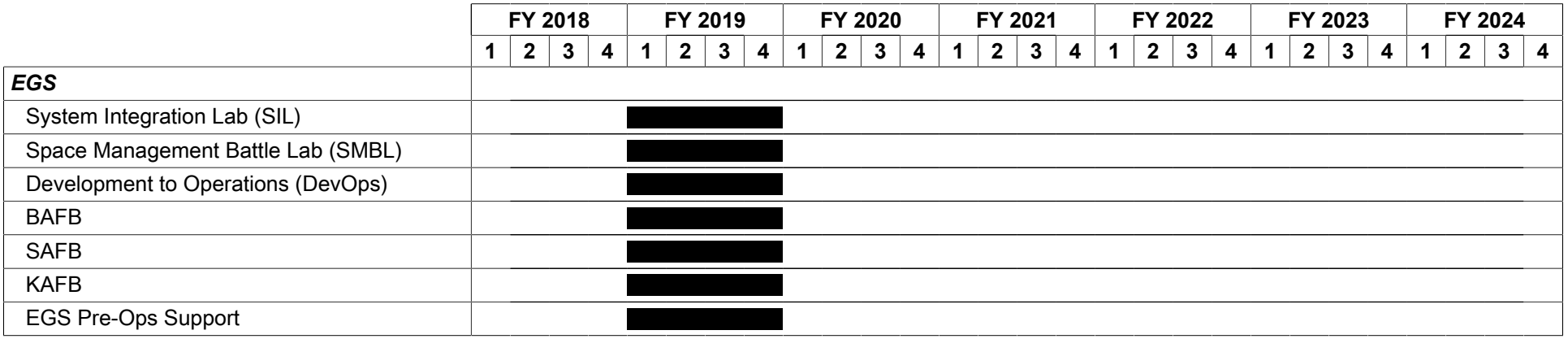

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203173F / *Space and Missile Test and Evaluation Center*	**Project (Number/Name)** 673140 / *Enterprise Ground Services EGS*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
EGS				
System Integration Lab (SIL)	1	2019	4	2019
Space Management Battle Lab (SMBL)	1	2019	4	2019
Development to Operations (DevOps)	1	2019	4	2019
BAFB	1	2019	4	2019
SAFB	1	2019	4	2019
KAFB	1	2019	4	2019
EGS Pre-Ops Support	1	2019	4	2019

Note

The schedule for EGS for FY2018 is under the RDSMO project (67A014) within this program. The schedule for EGS for FY 2020 is under the new EGS program (1206770F).

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 1203174F / *Space Innovation, Integration and Rapid Technology Development*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	9.081	21.019	43.292	0.000	43.292	44.761	24.643	24.859	67.149	Continuing	Continuing
67A011: *Space Analysis and Application Development*	-	9.081	21.019	43.292	0.000	43.292	44.761	24.643	24.859	67.149	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Located at Peterson AFB, Colorado, the Space Innovation, Integration and Rapid Technology Development (SIIRTD) program develops and modifies modeling and simulation tools that Air Force Space Command's Space Analysis Center uses for operations research, military utility analyses, tradeoff studies, and other evaluations of space mission areas to guide planning, programming, requirements generation, analyses of alternatives, and other activities. Development activities incorporate changes in fielded and projected space operational capabilities, as well as technical improvements, into the group's software tools to ensure their data and technology remain current. Space Training Simulators develop and upgrades space training emulators using Standard Space Trainer (SST) to meet Space Mission Force (SMF) threat-based, advanced training requirements as well as funds connection to Distributed Mission Operations (DMO)training networks. Finally, its innovation, education, and training activities foster solutions to operational deficiencies and enhance the integration of space systems into Air Force operations, thereby enabling service and joint warfighters to realize the full potential of existing and planned space capabilities.

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

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

The FY2020 funding request was reduced by $0.928M to account for the availability of prior year execution balances.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203174F / *Space Innovation, Integration and Rapid Technology Development*

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	11.390	21.019	24.220	0.000	24.220
Current President's Budget	9.081	21.019	43.292	0.000	43.292
Total Adjustments	-2.309	0.000	19.072	0.000	19.072
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	-2.000	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	-0.309	0.000			
• Other Adjustments	0.000	0.000	19.072	0.000	19.072

Change Summary Explanation

FY 2018: -$2.000M Congressional reduction - unjustified request

FY 2020: +$20.000M increase to accelerate development of standardized space trainers; -$0.928M reduction for execution rephase

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Model/Tool Development and Capability Upgrades	4.201	5.326	5.423

Description: Develops, verifies, and validates models for space mission areas and modifies existing models to portray new capabilities that meet the national senior leader intent. Advancing M&S tools to incorporate space effects at the campaign, mission and engagement levels with the goal of enhancing decision support, visualization, exercise and wargaming. Rapidly meet downward-directed guidance implementing the system resiliency and situational awareness necessary to win in a contested space domain. Activities may include, but are not limited to, acquisition, program office support, studies, technical analysis,prototyping, etc. The space M&S is used for military utility analyses, trade studies, and other space program evaluations supporting OSD, Joint Staff, Headquarters Air Force, Headquarters Air Force Space Command, and the Space and Missile Center.

FY 2019 Plans:

Revamp existing space models and tools to meet recent presidential, CDRSTRATCOM, and COMAFSPC guidance. Begin developing a space campaign model to assess force structures in a contested environment to better organize USSPACECOM/ Space Force warfighting needs. Continue transforming FY2018 activities. Key models include the Advanced Framework for Simulation, Integration, and Modeling (AFSIM). This is an Air Force process that harnesses disparate domain capabilities into a simulation environment. Threat, Vulnerability, Timeline (TVT) is a tool underpinning key POM decisions, overlaying force structure on the given threat constructs to identify warfighting shortfalls. The Program's mission/campaign modeling suites must be updated

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203174F / *Space Innovation, Integration and Rapid Technology Development*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
to produce technically sound and responsive space analyses for warfighter operations in a highly-contested environment. These tools assess how well we meet national and military needs identified by the Enterprise Space Architecture Office (ESAO) and Joint Space Warfighter Forum (JSWF). The Space Surveillance Network Analysis Model (SSNAM) is a key warfighting tool supporting the JFSCC's operation centers' situational awareness. As a major warfighting domain, it is critical we establish the tool to accurately represent space. Continue to produce technically sound and responsive space/cyberspace analyses analyzing warfighter ops in a highly-contested environment in support of national and military needs and other model modifications as needed based on leadership questions and future analysis of alternatives. ***FY 2020 Plans:*** Continue to modernize space models and tools to meet recent presidential, CDRSTRATCOM, and COMAFSPC guidance. Begin developing a space campaign model to assess force structures in a contested environment to better organize USSPACECOM/ Space Force warfighting needs. Continue transforming FY 2019 activities. Key models include the Advanced Framework for Simulation, Integration, and Modeling (AFSIM). This is an Air Force process that harnesses disparate domain capabilities into a simulation environment. Threat, Vulnerability, Timeline (TVT) is a tool underpinning key POM decisions, overlaying force structure on the given threat constructs to identify warfighting shortfalls. The Program's mission/campaign modeling suites must be updated to produce technically sound and responsive space analyses for warfighter operations in a highly-contested environment. These tools assess how well we meet national and military needs identified by the Enterprise Space Architecture Office (ESAO) and Joint Space Warfighter Forum (JSWF). The Space Surveillance Network Analysis Model (SSNAM) is a key warfighting tool supporting the JFSCC's operation centers' situational awareness. As a major warfighting domain, it is critical we establish the tool to accurately represent space. Continue to produce technically sound and responsive space/cyberspace analyses analyzing warfighter ops in a highly-contested environment in support of national and military needs. Produce other model modifications as needed based on leadership questions and future analysis of alternatives. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY2019 to FY2020 $0.097 increase due to inflation			
Title: Model Verification ***Description:*** Verification of changes made to models. ***FY 2019 Plans:***	1.752	2.330	2.373

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203174F / *Space Innovation, Integration and Rapid Technology Development*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Continue verification of model changes resulting from model development and modification efforts. Development and capability upgrades of system modeling tools. ***FY 2020 Plans:*** Continue to modernize space models and tools to meet recent presidential, CDRSTRATCOM, and COMAFSPC guidance. Begin developing a space campaign model to assess force structures in a contested environment to better organize USSPACECOM/ Space Force warfighting needs. Continue transforming FY 2019 activities. Key models include the Advanced Framework for Simulation, Integration, and Modeling (AFSIM). This is an Air Force process that harnesses disparate domain capabilities into a simulation environment. Threat, Vulnerability, Timeline (TVT) is a tool underpinning key POM decisions, overlaying force structure on the given threat constructs to identify warfighting shortfalls. The Program's mission/campaign modeling suites must be updated to produce technically sound tools assess and responsive space analyses for warfighter operations in a highly-contested environment. These tools assess how well we meet national and military needs identified by the Enterprise Space Architecture Office (ESAO) and Joint Space Warfighter Forum (JSWF). The Space Surveillance Network Analysis Model (SSNAM) is a key warfighting tool supporting the JFSCC's operation centers' situational awareness. As a major warfighting domain, it is critical we establish the tool to accurately represent space. Continue to produce technically sound and responsive space/cyberspace analyses analyzing warfighter ops in a highly-contested environment in support of national and military needs. Produce other model modifications as needed based on leadership questions and future analysis of alternatives. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY2019 to FY2020 $0.43M increase due to inflation			
Title: Model Validation	2.813	3.439	3.502
Description: Validated model change results. ***FY 2019 Plans:*** Continue validation of model changes resulting from model development and modification of system tools. ***FY 2020 Plans:*** Continue to modernize space models and tools to meet recent presidential, CDRSTRATCOM, and COMAFSPC guidance. Begin developing a space campaign model to assess force structures in a contested environment to better organize USSPACECOM/ Space Force warfighting needs. Continue transforming FY 2019 activities. Key models include the Advanced Framework for Simulation, Integration, and Modeling (AFSIM). This is an Air Force process that harnesses disparate domain capabilities into a simulation environment. Threat, Vulnerability, Timeline (TVT) is a tool underpinning key POM decisions, overlaying force structure on the given threat constructs to identify warfighting shortfalls. The Program's mission/campaign modeling suites must be updated			

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203174F / *Space Innovation, Integration and Rapid Technology Development*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
to produce technically sound and responsive space analyses for warfighter operations in a highly-contested environment. These tools assess how well we meet national and military needs identified by the Enterprise Space Architecture Office (ESAO) and Joint Space Warfighter Forum (JSWF). The Space Surveillance Network Analysis Model (SSNAM) is a key warfighting tool supporting the JFSCC's operation centers' situational awareness. As a major warfighting domain, it is critical we establish the tool to accurately represent space. Continue to produce technically sound and responsive space/cyberspace analyses analyzing warfighter ops in a highly-contested environment in support of national and military needs. Produce other model modifications as needed based on leadership questions and future analysis of alternatives. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2019 to FY 2020 $0.63M increase due to inflation			
Title: Space Training Simulators	0.315	9.924	31.994
Description: Develop/upgrade Standard Space Trainer (SST) simulators to meet Space Mission Force (SMF) threat-based, advanced training requirements as well as builds connectivity to Distributed Mission Operations (DMO) training networks. Follows direction set out in USAF Operational Training Infrastructure (OTI) Flight Plan, as well as meets United States Strategic Command's Integrated Priority List (IPL)priority. ***FY 2019 Plans:*** Distributed Mission Operations - Space (DMO-S) modeling and simulation development and develop the Geostationary Space Situational Awareness (GSAAP) Standard Space Trainer (SST). GSSAP SST will include DMO connectivity, Enterprise Ground Service (EGS) compatibility, and Blue/White/Red operator-in-the-loop modeling and simulation consoles (i.e., GSSAP space operator consoles, instructor/evaluator consoles, and opposing force consoles). Also begins development of Space-Based Infrared System (SBIRS), Upgraded Early Warning Radar (UEWR) SSTS and planned delivery of Global Positioning System (GPS) SST. ***FY 2020 Plans:*** Accelerate completion of SSTs for GSSAP and SBIRS (projected completion in early FY 2021); begin SST development for additional weapon systems, to include Mistar, Advanced Extremely High Frequency (AEHF), Wideband Global Satellite System (WGS), and Defense Satellite Communication System (DSCS). ***FY 2019 to FY 2020 Increase/Decrease Statement:***			

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203174F / *Space Innovation, Integration and Rapid Technology Development*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY 2019 to FY 2020 $22.070M increase due to additional SST development. As part of the Space Enterprise Vision and space training shortfalls outlined in the Space Cadre Task Force Report (15 Aug 18).			
Accomplishments/Planned Programs Subtotals	9.081	21.019	43.292

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• SPAF 01 GNRLT: *General IT*	1.661	1.564	1.350	-	1.350	1.374	1.398	1.425	1.451	Continuing	Continuing

Remarks

Funding and content procures equipment for the SIIRTD AFSPC Virtual Analysis Capability (AVAC) system. Supports space and cyber modeling and analysis using a variety of Linux and Windows based hardware and software suites. Also procures Information Technology (IT) hardware & software infrastructure for the Distributed Communications Architecture for ACC.

E. Acquisition Strategy

Any new projects funded in this program will be awarded using competitive procedures to the maximum extent possible.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203174F / *Space Innovation, Integration and Rapid Technology Development*	**Project (Number/Name)** 67A011 / *Space Analysis and Application Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Develop/modify software tools/models - OCO	C/Various	Various : Various	-	0.000		-		-		-		-	Continuing	Continuing	-
Develop/modify software tools/models	C/CPFF	SimaTek : Denver, CO	-	0.300	Mar 2018	0.303	Mar 2019	0.311	Mar 2020	-		0.311	Continuing	Continuing	-
Develop/modify software tools and models	C/CPFF	Segue Corp : Lake Forest, CA	-	1.870	Jan 2018	0.000		-		-		-	Continuing	Continuing	-
Develop and modify software tools/models	C/CPFF	Segue Corp : Lake Forest, CA	-	6.596	Jun 2018	10.792	Jun 2019	10.987	Jun 2020	-		10.987	Continuing	Continuing	-
Space Training Simulator Development	C/CPFF	Sonalysts Inc : San Diego, CA	-	0.315		9.924	Dec 2018	31.994	Dec 2019	-		31.994	Continuing	Continuing	-
		Subtotal	-	9.081		21.019		43.292		-		43.292	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	9.081		21.019		43.292		-		43.292	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203174F / *Space Innovation, Integration and Rapid Technology Development*	**Project (Number/Name)** 67A011 / *Space Analysis and Application Development*

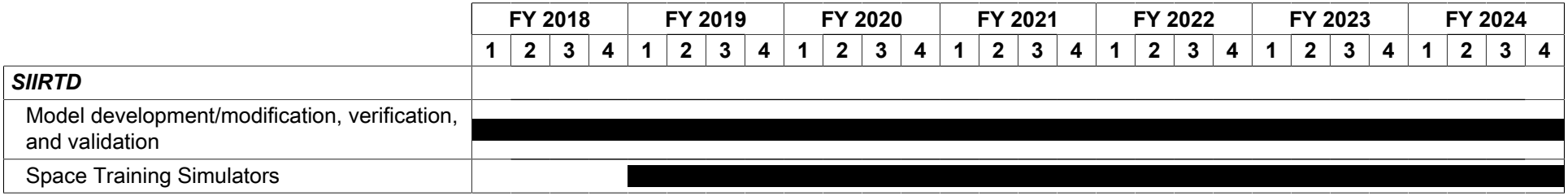

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203174F / *Space Innovation, Integration and Rapid Technology Development*	**Project (Number/Name)** 67A011 / *Space Analysis and Application Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
SIIRTD				
Model development/modification, verification, and validation	1	2018	4	2024
Space Training Simulators	1	2019	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 1203179F / *Integrated Broadcast Service (IBS)*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	8.747	8.568	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
674779: *Integrated Broadcast Service (IBS)*	-	8.747	8.568	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY2020, Integrated Broadcast Service PE1203179F effort transfer to PE0305179F due to realignment to Major Force Program for Intelligence and Communications.

A. Mission Description and Budget Item Justification

The IBS fulfills the warfighter's requirements for worldwide threat warning and situational awareness information with timely production and simultaneous dissemination of Intelligence, Surveillance, and Reconnaissance (ISR) derived combat information. It also provides target tracking data to support threat avoidance, targeting, force protection, and situational awareness. This information is continually refined in near real time by strategic, operational and tactical sensors.

IBS is comprised of the following:
- A Common Interactive Broadcast (CIB) on UHF (Ultra High Frequency) satellite channel using a Common Message Format (CMF) and a Military Standard (MIL-STD) Demand Assigned Multiple Access (DAMA) compliant waveform and Line of Sight (LOS) using the Wideband Networking Waveform (WNW) and Joint Tactical Terminal (JTT).
- IBS-Network Services (IBS-NS) includes two Global IBS Network Servers (GINS) and four Theater Interface Nodes (TINs) to support the geographic Combatant Commanders (COCOMs), all built to validated warfighter requirements.
-- Two GINS receive data from each theater and integrate this data into a worldwide picture available to all network/broadcast users.
-- Four regional TINs allow local and out-of-theater users (not directly receiving IBS broadcast) to receive the CIB information broadcast. Additionally, the TIN will receive and inject data into the CIB for producers without access to the theater CIB.

This PE funds:
- Development/upgrades of IBS (IBS-NS, CIB, and CMF)

This project will identify and implement an open, scalable system architecture that will accommodate growth as the virtual world grows and cyber operations change.

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

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203179F / *Integrated Broadcast Service (IBS)*

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	8.747	8.568	8.728	0.000	8.728
Current President's Budget	8.747	8.568	0.000	0.000	0.000
Total Adjustments	0.000	0.000	-8.728	0.000	-8.728
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	-8.728	0.000	-8.728

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Development/upgrades of the Integrated Broadcast Service (IBS-NS, CIB, and CMF)	7.257	7.078	0.000
Description: Development/upgrades of the IBS (IBS-NS, CIB, and CMF). ***FY 2019 Plans:*** - Will continue to synchronize and integrate with DOD IC Cloud as a potential producer/consumer; the capability will provide a long term searchable data store for IBS information. - Will continue to upgrade the IBS Enterprise-level real-time and analytic views on Global and COCOM watch floors; further integrate uplink sites with associated TIN by reducing equipment overhead and streamlining data flows - Will continue to upgrade Near Real-Time Information volumetric increase to provide ten times performance enhancement to throughput, storage and replay to address message volume; this will increase the enterprise output to 100M messages per day			

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203179F / *Integrated Broadcast Service (IBS)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Will continue to provide resilience to IBS CIB UHF Broadcast by utilizing the MUOS Wideband Code Division Multiple Access SATCOM payload and supporting the receipt of IBS on 1st generation MUOS terminals - Will continue to upgrade and connect the COCOM J2 CIB planning function with the COCOM J6 Integrated Waveform planning function - Will continue to upgrade the CIB Planning Tool and IBS-NS capability at the COCOMs to allow automated planning to occur for active producers - Will continue development of the IBS Thin Client, which provides a light weight application to receive IBS information on mobile devices - Will continue development of the CIB MUOS Group Integration - Many to Many, which achieves IBS Over the Air requirements on the MUOS, WCDMA payload - Will continue to upgrade the P5 system health and welfare status at the COCOMs to include Alt-Path -- Will continue to upgrade the resiliency of IBS to include polar coverage - Will continue to upgrade and transition current classified dissemination path to new architecture and enable SCI-level dissemination of data - Will continue enhancement of uplink sites to handle operational surge increases - Will continue to upgrade the monitoring and control tools to assist in assured dissemination tasks at COCOM uplink watches, development and fielding of DME ***FY 2020 Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** PE1203179F efforts transfer to PE0305179F			
Title: Enterprise Systems Engineering ***Description:*** Enterprise Systems Engineering/CMF Integration/CIB Integration.	0.700	0.700	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203179F / *Integrated Broadcast Service (IBS)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY 2019 Plans: - Will continue Enterprise Systems Engineering/CMF Integration/CIB Integration ***FY 2020 Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** PE1203179F efforts transfer to PE0305179F			
Title: Test & Evaluation ***Description:*** Tests & Evaluates the IBS system. ***FY 2019 Plans:*** - Will continue test and evaluation of the IBS system ***FY 2020 Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** PE1203179F efforts transfer to PE0305179F	0.790	0.790	0.000
Accomplishments/Planned Programs Subtotals	8.747	8.568	0.000

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPAF 03 Line Item 832070: *Intelligence Comm Equipment*	17.270	0.000	16.743	-	16.743	17.134	17.341	17.667	17.985	Continuing	Continuing
• SPAF 01 IBS000: *INTEG BROADCAST SERV*	-	16.445	-	-	-	-	-	-	-	0.000	16.445

Remarks

E. Acquisition Strategy

IBS is in the PEO Battle Management portfolio and executed by AFLCMC/HBG.

IBS uses an Adaptive Life-cycle approach that provides incremental improvement and new capability in 90-day cycles.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203179F / *Integrated Broadcast Service (IBS)*

For contracting efforts, a Single Award IDIQ contract with multiple task orders was awarded to CACI International Inc.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203179F / *Integrated Broadcast Service (IBS)*	Project (Number/Name) 674779 / *Integrated Broadcast Service (IBS)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
IBS (IBS-NS, CIB, and CMF) Development/ Upgrades	Various	CACI International Inc/Other Government Agency : Various	-	7.097	Oct 2017	6.918	Oct 2018	0.000		-		0.000	Continuing	Continuing	-
		Subtotal	-	7.097		6.918		0.000		-		0.000	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Interoperability and Development Testing	MIPR	JITC : Ft Huachuca, AZ	-	0.500	Oct 2017	0.500	Oct 2018	0.000		-		0.000	Continuing	Continuing	-
Responsible Test Organization (RTO)	PO	46th Test Squadron : Eglin AFB, FL	-	0.290	Oct 2017	0.290	Oct 2018	0.000		-		0.000	Continuing	Continuing	-
		Subtotal	-	0.790		0.790		0.000		-		0.000	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management/ Engineering Support	C/FFP	Creedence : Warner Robins, GA	-	0.160	Nov 2017	0.160	Nov 2018	0.000	Nov 2018	-		0.000	Continuing	Continuing	-
Enterprise Engineering/ CMF Integration/CIB Integration	SS/CPFF	L3 Comm, IS : Greenville, TX	-	0.700	Nov 2017	0.700	Nov 2018	-		-		-	Continuing	Continuing	-
		Subtotal	-	0.860		0.860		0.000		-		0.000	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	8.747		8.568		0.000		-		0.000	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203179F / *Integrated Broadcast Service (IBS)*	Project (Number/Name) 674779 / *Integrated Broadcast Service (IBS)*	

	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203179F / *Integrated Broadcast Service (IBS)*	**Project (Number/Name)** 674779 / *Integrated Broadcast Service (IBS)*

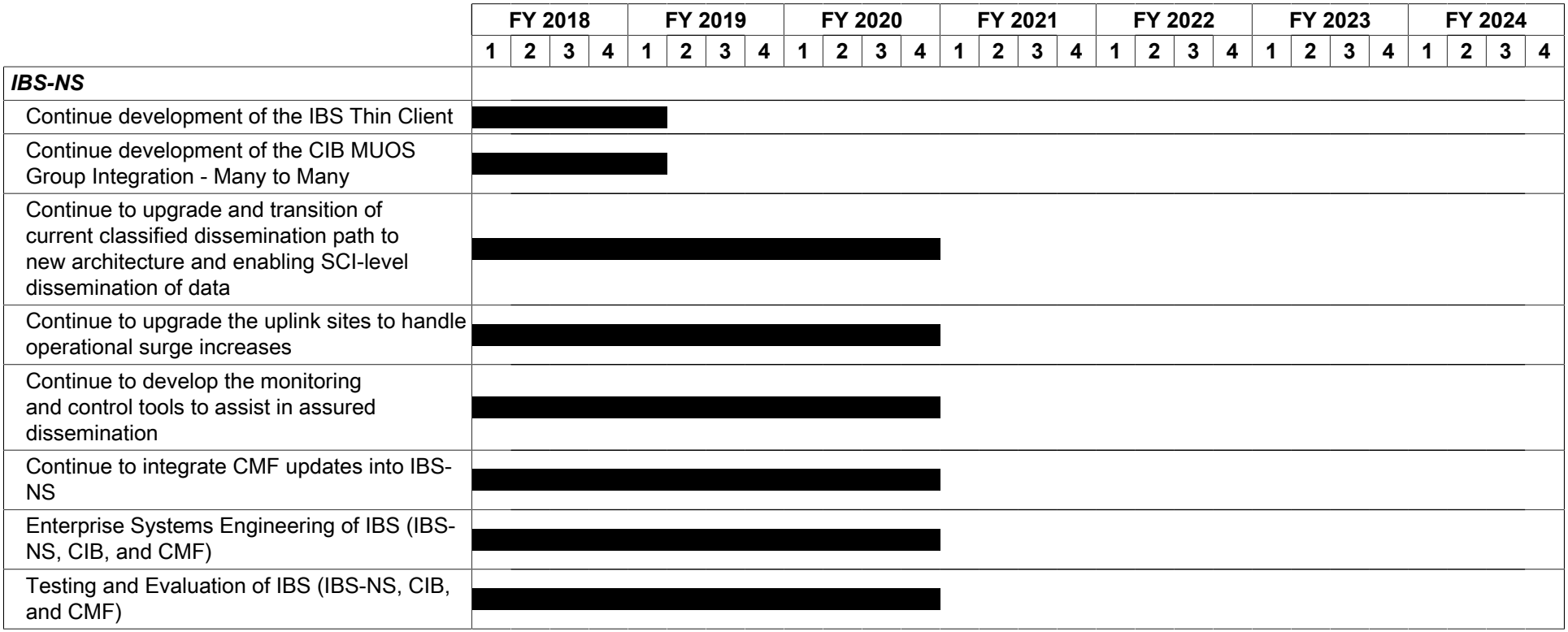

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203179F / *Integrated Broadcast Service (IBS)*	**Project (Number/Name)** 674779 / *Integrated Broadcast Service (IBS)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
IBS-NS				
Continue development of the IBS Thin Client	1	2018	1	2019
Continue development of the CIB MUOS Group Integration - Many to Many	1	2018	1	2019
Continue to upgrade and transition of current classified dissemination path to new architecture and enabling SCI-level dissemination of data	1	2018	4	2020
Continue to upgrade the uplink sites to handle operational surge increases	1	2018	4	2020
Continue to develop the monitoring and control tools to assist in assured dissemination	1	2018	4	2020
Continue to integrate CMF updates into IBS-NS	1	2018	4	2020
Enterprise Systems Engineering of IBS (IBS-NS, CIB, and CMF)	1	2018	4	2020
Testing and Evaluation of IBS (IBS-NS, CIB, and CMF)	1	2018	4	2020

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 1203182F / *Spacelift Range System (SPACE)*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	20.035	20.168	10.837	0.000	10.837	11.023	11.253	11.459	10.989	Continuing	Continuing
674137: *Launch and Test Range System (LTRS) Modernization*	-	20.035	20.168	10.837	0.000	10.837	11.023	11.253	11.459	10.989	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Spacelift Range System (SLRS), also known as the Launch and Test Range System (LTRS), provides public safety and assured access to space. LTRS operates at the Eastern Range (ER) at Patrick AFB/Cape Canaveral AFS, FL and the Western Range (WR) at Vandenberg AFB, CA. LTRS provides tracking, telemetry, communications, flight safety, and other capabilities to support launch of national security space (NSS), civil and commercial space payloads, Intercontinental and Sea Launched ballistic missile and missile defense evaluations, and aeronautical and guided weapon tests. LTRS enables national security, civil, and commercial spacelift operations to be conducted safely; together with national security space launch capability, LTRS provides assured access to space for the nation. The ER and WR are designated as Department of Defense Major Range and Test Facility Bases (MRTFB).

LTRS is comprised of twelve subsystems that together provide this capability to the ranges. The Range Safety and Command Destruct subsystems provide the capability to destroy an errant rocket, if necessary to protect public safety. These subsystems rely on the Telemetry, Radar, and Optics subsystems to provide tracking data. The Weather and Surveillance subsystems allow range operators and customers to determine if conditions are safe for launch. The Communications, Data Handling, and Timing & Sequencing subsystems ensure critical data is expeditiously routed from remote sensors (e.g. radars, optics) to range operators and customers. Finally, the Planning and Scheduling subsystem ensures all assets are available when needed for a launch or test operation.

As aging range systems exhibit decreasing reliability, leading to higher operations and maintenance costs and increasing the risk of launch delays, the Air Force requires RDT&E funds to conduct architecture analyses to optimize investment planning for safety of flight (such as the use of drones, high definition optics, phased-array radars etc.) and commercial launch.

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

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

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203182F / *Spacelift Range System (SPACE)*

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	10.549	10.641	10.837	0.000	10.837
Current President's Budget	20.035	20.168	10.837	0.000	10.837
Total Adjustments	9.486	9.527	0.000	0.000	0.000
• Congressional General Reductions	-0.214	-0.473			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	10.000	10.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.300	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2018	FY 2019
Project: 674137: *Launch and Test Range System (LTRS) Modernization*		
Congressional Add: *Launch Range Services and Capability*	9.786	9.771
Congressional Add Subtotals for Project: 674137	9.786	9.771
Congressional Add Totals for all Projects	9.786	9.771

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: LTRS Range Technology Integration	6.153	6.811	7.237
Description: Previously known as Systems Engineering Support to the Operational Baseline. Provides Advisory and Assistance Services (A&AS) support of the operational baseline (all twelve subsystems) to include configuration management of all range assets, requirements analyses, and special studies. Provides support for Systems Program Office operations, Systems Engineering and Technical Assistance (SETA), and Federally Funded Research and Development Centers (FFRDC). Strategically executes experimentation, prototyping, risk reduction, and other efforts to develop new or repurpose capabilities.			

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203182F / *Spacelift Range System (SPACE)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY 2019 Plans: Continue to manage the baseline (all twelve subsystems) to include configuration management and all range assets, requirements, analysis and special studies. Fund Multi-Band Multi-Mission (MBMM) antenna prototyping effort to meet both Launch and Test Range and Air Force Satellite Control Network (AFSCN) requirements. MBMM is described in the AFSCN R-doc, PE 1203110F. ***FY 2020 Plans:*** Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 increase compared to FY 2019 by $0.426M. Justification for this increase is described in plans above.			
Title: Enterprise Systems Engineering and Integration to Support Government-Controlled Baseline ***Description:*** SE&I manages the government controlled system and subsystem level baseline requirements including analysis of future changes to the fielded baseline. SE&I provides "government as the integrator" engineering support to ensure multiple separate modernizations and the sustainment baseline are synchronized. SE&I will develop and recommend investment strategies to keep the Eastern and Western Ranges operating well beyond the FYDP. ***FY 2019 Plans:*** Continue program office support and other related support activities that may include, but are not limited to studies, technical analysis, prototyping, etc. ***FY 2020 Plans:*** Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 increased compared to FY 2019 by $0.014M. Justification for this increase is described in plans above.	4.096	3.586	3.600
Accomplishments/Planned Programs Subtotals	10.249	10.397	10.837

	FY 2018	FY 2019
Congressional Add: Launch Range Services and Capability	9.786	9.771

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203182F / *Spacelift Range System (SPACE)*

	FY 2018	FY 2019
FY 2018 Accomplishments: Continued improvements to launch support capabilities for polar-to-high inclination orbits including upgrading telemetry, range systems, site capabilities, security, and meteorological systems. ***FY 2019 Plans:*** N/A		
Congressional Adds Subtotals	9.786	9.771

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• SPAF 01 Line Item SPRNGE: *Spacelift Range System Space*	113.222	117.637	118.140	-	118.140	100.598	95.041	75.866	110.014	Continuing	Continuing
• RDTE 07 1203110F: *Satellite Control Network (SPACE)*	18.133	26.440	61.891	-	61.891	16.167	16.503	16.804	17.107	Continuing	Continuing

Remarks

E. Acquisition Strategy

Due to the fielded LTRS age and obsolescence issues, many systems need to be replaced (e.g. communications systems at ER & WR). These major modifications will be competed, typically among small business contractors, and selected through best value source selections. The competitively-selected SE&I contractor manages government-controlled requirements and processes as well as provide support to the "government as the integrator" between LTRS Integrated Support Contract (LISC) and separately competed modernization projects. FFRDC provides mission assurance oversight to ensure capabilities meet operational need.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203182F / *Spacelift Range System (SPACE)*	Project (Number/Name) 674137 / *Launch and Test Range System (LTRS) Modernization*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Enterprise Systems Engineering and Integration	C/FPIF	ENSCO INC : Falls Church, VA	-	4.096	Oct 2017	3.586	Oct 2018	3.600	Oct 2019	-		3.600	Continuing	Continuing	-
LTRS Range Technology Integration	C/Various	Various : TBD	-	1.640	May 2018	1.409	May 2019	6.549	May 2020	-		6.549	Continuing	Continuing	-
MBMM Prototyping	MIPR	Defense Innovation Unit : Mountain View, CA	-	3.859	Mar 2019	4.731	Mar 2019	-		-		-	Continuing	Continuing	-
Launch Range Services and Capability	SS/TBD	NASA : Wallops, VA	-	9.786	Sep 2018	9.771	Mar 2019	-		-		-	Continuing	Continuing	-
		Subtotal	-	19.381		19.497		10.149		-		10.149	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TEST AND EVALUATION (WS)	Various	MIT, 17th Test Squad, NAVAIR : Various	-	-		-		-		-		-	Continuing	Continuing	-
		Subtotal	-	-		-		-		-		-	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FFRDC	RO	Aerospace : El Segundo, CA	-	0.444	Nov 2017	0.457	Nov 2018	0.471	Nov 2019	-		0.471	Continuing	Continuing	-
OTHER SUPPORT	PO	Various : El Segundo, CA	-	0.210	Nov 2017	0.214	Nov 2018	0.217	Nov 2019	-		0.217	Continuing	Continuing	-
		Subtotal	-	0.654		0.671		0.688		-		0.688	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203182F / *Spacelift Range System (SPACE)*	Project (Number/Name) 674137 / *Launch and Test Range System (LTRS) Modernization*	

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	20.035		20.168		10.837		-		10.837	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203182F / *Spacelift Range System (SPACE)*	**Project (Number/Name)** 674137 / *Launch and Test Range System (LTRS) Modernization*

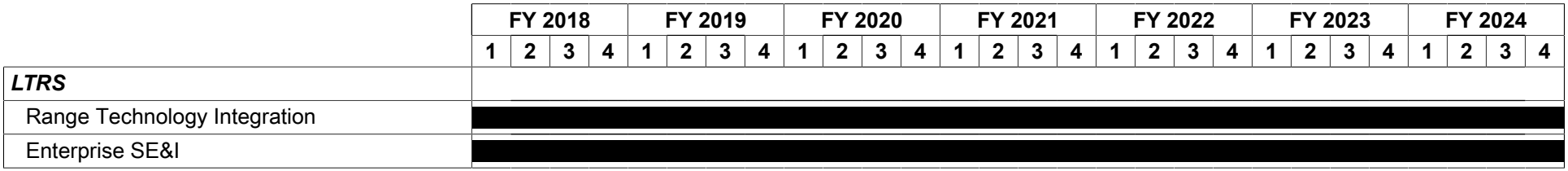

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203182F / *Spacelift Range System (SPACE)*	**Project (Number/Name)** 674137 / *Launch and Test Range System (LTRS) Modernization*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
LTRS				
Range Technology Integration	1	2018	4	2024
Enterprise SE&I	1	2018	4	2024

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 1203265F / *GPS III Space Segment*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	3,112.320	233.043	141.892	42.440	0.000	42.440	10.780	7.296	7.451	7.585	Continuing	Continuing
676007: *SAR- GPS*	10.019	1.277	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	11.296
67A011: *Space Analysis and Application Development*	0.000	19.326	69.481	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
67A019: *GPS III*	3,102.301	212.440	72.411	42.440	0.000	42.440	10.780	7.296	7.451	7.585	26.717	3,489.421
Program MDAP/MAIS Code: 292												

A. Mission Description and Budget Item Justification

The Global Positioning System (GPS) is a space-based navigation system that fills validated Joint Service requirements for worldwide, accurate, common-grid three-dimensional positioning/navigation for military aircraft, ships, and ground personnel. The consistent accuracy, unaffected by location or weather and available in real time, significantly improves effectiveness of reconnaissance, weapons delivery, mine countermeasures, and rapid deployment for all services. GPS must comply with Title 10 United States Code (USC) Sec. 2281, which requires that the Secretary of Defense ensure continued sustainment and operations of GPS for military and civilian purposes, and 51 USC Sec. 50112, which requires that GPS comply with certain standards and facilitate international cooperation.

The system is composed of three segments: User Equipment (funded under Program Element (PE) 1203164F), Space (funded under this PE and PE 1203269F) and a Control Network (funded under PE 1203165F and PE 1206423F). The satellites broadcast high-accuracy data using precisely synchronized signals that are received and processed by user equipment installed in military platforms. This equipment computes the platform position and velocity and provides steering vectors to target locations or navigation waypoints. The control segment provides daily updates to the navigation messages broadcast from the satellites to maintain system precision in three dimensions to 16 meters (spherical error probable) worldwide. Additionally, GPS supports the United States Nuclear Detonation (NUDET) Detection System (USNDS) mission and provides strategic and tactical support to the following Department of Defense (DoD) missions: Joint Operations by providing capabilities for Positioning, Navigation, and Timing (PNT); Command, Control, Communications, and Intelligence (C3I); Special Operations; Military Operations in Urban Terrain (MOUT); Defense- Wide Mission Support; Air Mobility; and Space Launch Orbital Support.

GPS III is the next generation Space Vehicle (SV) supporting the GPS constellation and is funded in PE 1203265F. GPS III SVs will deliver significant enhancements, including a new international civil (L1C) signal, enhanced anti-jam power. GPS III SVs 03-10 are in the Production & Deployment Phase.

PE 1203265F funds GPS III and supports the Research, Development, Test, and Evaluation (RDT&E) of GPS III SVs 01-02 and risk-reducing simulators through a systems engineering approach that matures and delivers SVs for launch. This PE includes SVs 01-02 engineering studies and analyses, trade studies, system development, test and evaluation efforts, integrated logistics support products, on-orbit support, and mission operations support for civil and military applications that protect United States (U.S.) military and allied use of GPS. The program also includes Contingency Operations (COps) as a bridge capability to fly GPS III SVs until the delivery of the GPS Next Generation Operational Control System (OCX).

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203265F / *GPS III Space Segment*

Starting in FY 2019, PE 1203269F funds the RDT&E of GPS IIIF (SVs 11-12), which will include Non-Recurring Engineering (NRE) support efforts. GPS IIIF includes design activity, risk-reducing simulators, and systems engineering associated with delivering the new capabilities required of GPS IIIF SVs, including backward compatibility, dual band Telemetry, Tracking, and Control (TT&C), integration of Government Furnished Equipment (GFE) hosted payloads, a new civil (L1C) Galileo-compatible signal, and the Regional Military Protection (RMP) capability that provides the ability to deliver high-power regional Military Code (M-Code) signals in specific areas of intended effect.

The Air Force (AF) is using its research laboratories to mature an On-Orbit Reprogrammable Digital Waveform Generator (ORDWG), which provides signal flexibility to change the signal form while the satellite is on-orbit. This effort will be funded with Air Force Research Laboratory (AFRL) Science & Technology (S&T) funding and PE 1203265F GPS III to increase the number of alternate navigation payloads and inform future PNT architectures.

Mission Readiness Campaign (MRC) activities include launch preparation, planning, mission readiness testing to validate space-ground-user interfaces, mission crew exercises and rehearsals, launch vehicle integration, and On-Orbit Checkout activities to validate performance prior to and after launch. Newly certified launch vehicles must be incorporated into the GPS III launch baseline. Integration requires the development of plans and procedures and procurement of special support equipment.

GPS supports the early deployment of Global M-Code to meet the congressional mandate limiting user equipment purchases to M-Code-capable receivers starting in FY 2017. Funds in this PE will cover the M-Code Early Use (MCEU) program and support development costs associated with the GPS control segment software to provide core M-Code capabilities to the warfighter, as well as the ability to command and control, process, and monitor the M-Code signal. MCEU mitigates delays with OCX, supports Military Global Positioning System User Equipment (MGUE) testing, and allows for early M-Code operations. M-Code provides greater security to protect navigation and timing in electronically contested environments.

Impacts of the M-Code deployment include:
-Compliance with The Air Force Space Command Commander's mandate to provide global monitoring necessary for early M-Code operational use and verification of Navigation Warfare (NAVWAR) effects.
-Direction to improve the resiliency of the GPS capability.
-Confirmation that Enterprise modernization efforts are integrated and deployed properly.
-Testing and Verification of M-Code capability on MGUE/GPS III solution and early M-Code use tied to MGUE fielding.

The feasibility studies and preliminary engineering analyses that are funded with this budget item help to determine whether an initiative to host GPS M-Code augmentation payloads on other satellite systems is practical and beneficial. The primary goal is to provide additional mission assurance and resiliency through redundant systems not directly connected with the current U.S. GPS satellite constellation. This augmentation to the GPS constellation enables future rapid technology on-ramps with minimal risk.

Space acquisition must respond with speed and agility to emerging adversary threats. Space & Missile Systems Center (SMC) is transforming the organization and implementation of space acquisition to an enterprise approach, maximizing innovation and resiliency, leveraging international, commercial, and mission partnerships, and managing program/project priorities according to an integrated unclassified/classified enterprise space architecture. Expanding the appropriate acquisition

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203265F / *GPS III Space Segment*

authorities and contract mechanisms to deliver capability sooner, SMC will strategically execute experimentation, prototyping, risk reduction, and other efforts to develop new or repurpose capabilities.

This PE may include necessary civilian pay expenses required to manage, execute, and deliver GPS III Space Segment weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in PEs 1206392F and 1206398F.

This PE encompasses the GPS III (SVs 01-10), COps, MCEU, M-Code Hosted Payload, and prior to FY 2019, GPS IIIF Production Readiness efforts.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	243.435	144.543	42.440	0.000	42.440
Current President's Budget	233.043	141.892	42.440	0.000	42.440
Total Adjustments	-10.392	-2.651	0.000	0.000	0.000
• Congressional General Reductions	-1.839	-2.651			
• Congressional Directed Reductions	-10.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	10.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-8.553	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

Change Summary Explanation

FY 2018: -$10.000M Excess to Need (GPS III)

FY 2018: +$10.000M Congressional plus up for GPS Backup Technology demo

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203265F / *GPS III Space Segment*	Project (Number/Name) 676007 / *SAR- GPS*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
676007: *SAR- GPS*	10.019	1.277	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	11.296
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Search and Rescue GPS (SAR/GPS) is an approved auxiliary payload on GPS IIIF beginning no earlier than SV 11. SAR/GPS fills validated National Search and Rescue (SAR) Committee requirements to provide enduring, space-based distress alerting capability to detect, locate, and relay distress alerts to fulfill its responsibilities under international agreements for SAR.

In addition, the United States Air Force (USAF) has on-going requirements to rescue US Military personnel in harm's way per AF Doctrine Document 2-1.6. The implementation of a U.S. Medium Earth Orbiting (MEO) SAR Space Segment is via a Canadian-provided 406 MHz SAR repeater on GPS IIIF SVs. This system presents a cost effective, low-risk opportunity that accommodates existing and planned 406 MHz beacons across the globe. Per National Security Presidential Directive (NSPD)-39, USAF and United States Coast Guard (USCG), the U.S. operators of the civil Cosmicheskaya Sistyema Poiska Avariynich Sudov-Search and Rescue Satellite-Aided Tracking (COSPAS/SARSAT) system, and the international SAR system will integrate the Canadian provided SAR repeater into GPS IIIF beginning no earlier than SV 11.

SAR/GPS funds were transferred to GPS III SPAF beginning in FY 2019.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: SAR/GPS	1.277	0.000	0.000
Description: Nonrecurring costs for systems engineering activities to integrate the payload onto the GPS IIIF program no earlier than SV 11. ***FY 2019 Plans:*** N/A ***FY 2020 Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	1.277	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203265F / *GPS III Space Segment*	**Project (Number/Name)** 676007 / *SAR- GPS*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• SPAF 01 Line Item GPSIII: *GPS III*	63.664	69.386	35.466	-	35.466	18.543	18.920	19.332	19.680	Continuing	Continuing

Remarks

D. Acquisition Strategy

SAR/GPS and Laser Retroreflector Array (LRA) will be integrated as part of the GPS IIIF program no earlier than SV 11.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203265F / *GPS III Space Segment*	Project (Number/Name) 676007 / *SAR- GPS*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Search and Rescue SAR/ GPS Integration	Various	Engility Corp (TASC) : El Segundo, CA	9.519	1.277	Dec 2017	-		-		-		-	0.000	10.796	-
		Subtotal	9.519	1.277		-		-		-		-	0.000	10.796	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Search and Rescue SAR/ GPS FFRDC	MIPR	Aerospace Corp : El Segundo, CA	0.500	-		-		-		-		-	0.000	0.500	-
		Subtotal	0.500	-		-		-		-		-	0.000	0.500	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	10.019	1.277		0.000		-		-		-	0.000	11.296	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203265F / *GPS III Space Segment*	**Project (Number/Name)** 676007 / *SAR- GPS*

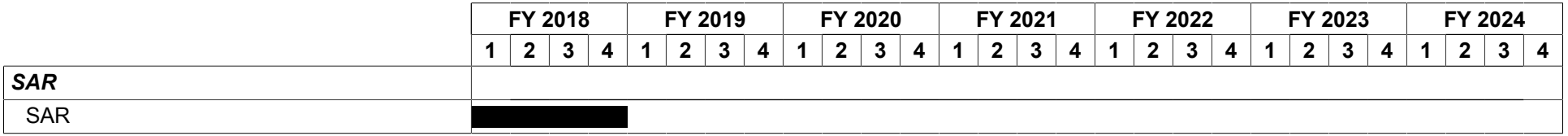

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203265F / *GPS III Space Segment*	**Project (Number/Name)** 676007 / *SAR- GPS*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
SAR				
SAR	1	2018	4	2018

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203265F / *GPS III Space Segment*	Project (Number/Name) 67A011 / *Space Analysis and Application Development*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
67A011: *Space Analysis and Application Development*	0.000	19.326	69.481	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Space Analysis and Application Development M-Code Hosted Payload will provide additional mission assurance through redundant systems not directly connected with the current U.S. GPS satellite constellation. The feasibility studies and preliminary engineering analyses funded in this project will determine whether an initiative to host GPS M-Code augmentation payloads on other satellite systems is practical and beneficial. The primary goal is to provide additional mission assurance and resiliency through redundant systems not directly connected with the current U.S. GPS satellite constellation. This augmentation to the GPS constellation enables future rapid technology on-ramps with minimal risk.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: M-Code Hosted Payload	19.326	69.481	0.000
Description: The initial studies, prototyping, and experiments will explore size, weight, power, and cost (SWAP-C) requirements of potential payloads, the level of broadcast power as received on the ground, advanced signal capabilities, the needed modifications that will allow current and future GPS ground control systems to communicate with these payloads, and how best to upgrade GPS user equipment with minimal impact on cost and downtime to existing GPS users. ***FY 2019 Plans:*** Complete initial feasibility study and preliminary engineering analysis, which will inform Hosted Payload and NTS-3 programs, with the goal of starting a Preliminary Design Review (PDR) no later than the fourth quarter FY 2019. Begin long lead procurement activities and NTS-3 prototype production. Deliver Hosted Payload Interface Unit (HPIU) unit for testing. Leverage AFRL efforts to initiate technology maturation on modular, host-agnostic payloads in order to bridge technologies to multiple future hosts and promote standardized interfaces for competition. Continue program office support and other related support activities that may include, but are not limited to, studies, technical analysis, prototyping, etc. ***FY 2020 Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	19.326	69.481	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203265F / *GPS III Space Segment*	**Project (Number/Name)** 67A011 / *Space Analysis and Application Development*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Hosted payload studies and engineering analysis to be conducted by Federally Funded Research and Development Centers (FFRDCs), GPS satellite vendors, and contractors involved with user equipment development.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203265F / *GPS III Space Segment*	**Project (Number/Name)** 67A011 / *Space Analysis and Application Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
M-Code Hosted Payload	Various	Various : Various	0.000	8.958	Nov 2017	61.475	Nov 2018	-		-		-	Continuing	Continuing	-
Technical Mission Analysis	MIPR	Aerospace : El Segundo, CA	0.000	0.000		0.000		-		-		-	Continuing	Continuing	-
Enterprise SE&I	C/CPAF	SAIC : El Segundo, CA	0.000	0.717	May 2018	1.052	May 2019	-		-		-	Continuing	Continuing	-
Department of Homeland Security/ Transportation	MIPR	Various : Various	0.000	9.649	Dec 2018	-		-		-		-	Continuing	Continuing	-
		Subtotal	0.000	19.324		62.527		-		-		-	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FFRDC	MIPR	Various : Various	0.000	0.002	Nov 2017	1.246	Dec 2018	-		-		-	Continuing	Continuing	-
A&AS	Various	Various : Various	0.000	0.000		5.643	Mar 2019	-		-		-	Continuing	Continuing	-
Other Support	Various	Various : El Segundo, CA	0.000	0.000		0.065	Oct 2018	-		-		-	Continuing	Continuing	-
		Subtotal	0.000	0.002		6.954		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	19.326		69.481		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203265F / *GPS III Space Segment*	**Project (Number/Name)** 67A011 / *Space Analysis and Application Development*

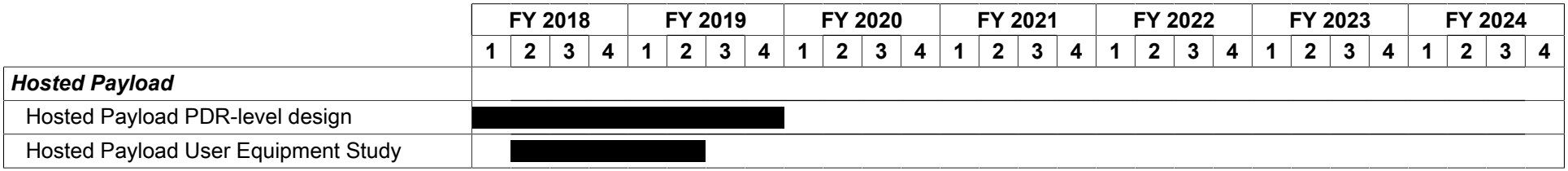

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203265F / *GPS III Space Segment*	**Project (Number/Name)** 67A011 / *Space Analysis and Application Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Hosted Payload				
Hosted Payload PDR-level design	1	2018	4	2019
Hosted Payload User Equipment Study	2	2018	2	2019

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203265F / *GPS III Space Segment*	Project (Number/Name) 67A019 / *GPS III*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
67A019: *GPS III*	3,102.301	212.440	72.411	42.440	0.000	42.440	10.780	7.296	7.451	7.585	26.717	3,489.421
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

GPS III is the next-generation SV supporting the GPS constellation and is funded in PE 1203265F. GPS III SVs will deliver significant enhancements, including a new international civil (L1C) signal, and enhanced anti-jam power. GPS III SVs 03-10 are in the Production & Deployment Phase.

PE 1203265F funds GPS III and supports RDT&E of GPS III SVs 01-02 and risk-reducing simulators through a systems engineering approach that matures and delivers SVs for launch. This program includes SVs 01-02 engineering studies and analyses, trade studies, system development, test and evaluation efforts, integrated logistics support products, on-orbit support, and mission operations support for civil and military applications that protect U.S. military and allied use of GPS. The program also includes Contingency Operations (COps) as a bridge capability to fly GPS III SVs until the delivery of the GPS OCX program.

Mission Readiness Campaign (MRC) activities include launch preparation, planning, mission readiness testing to validate space-ground-user interfaces, mission crew exercises and rehearsals, launch vehicle integration, and On-Orbit Checkout activities to validate performance prior to launch and post launch. Newly certified launch vehicles must be incorporated into the GPS III launch baseline. Integration requires the development of plans and procedures and procurement of special support equipment.

Space Modernization Initiative (SMI) focuses on space vehicle affordability and capability, addresses future requirements and resiliency needs, and expands the industrial base to enhance future competition. Phase 1 will address GPS Enterprise Analysis of Alternative (AoA) recommendations to increase GPS signal strength from space by maturing navigation payload technologies that include a new regional M-Code capability. The AF is using its research laboratories to mature an On-Orbit Reprogrammable Digital Waveform Generator (ORDWG), which will provide signal flexibility to change the signal form while the satellite is on-orbit. This effort will be funded with AFRL's S&T funding, PE 1203265F, and PE 1203269F (starting in FY 2019) to increase the number of alternate navigation payloads.

GPS supports the early deployment of Global M-Code to meet a congressional mandate limiting user equipment purchase to M-Code-capable receivers starting in FY 2017. The funds will cover the MCEU program and support development costs associated with the GPS control segment software to provide core M-Code capabilities to the warfighter, as well as the ability to command and control, process, and monitor the M-Code signal. MCEU mitigates delays with GPS OCX, supports MGUE testing, and allows for early M-Code operations. M-Code provides greater security to protect navigation and timing in electronically contested environments.

Impacts of the M-Code deployment include:
-Compliance with The Air Force Space Command Commander's mandate to provide global monitoring necessary for early m-code operational use and verification of NAVWAR effects.
-Direction to improve the resiliency of the GPS capability.
-Confirmation that Enterprise modernization efforts are integrated and deployed properly.
-Testing and Verification of M-Code capability on MGUE/GPS III solution and early M-Code use tied to MGUE fielding.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203265F / *GPS III Space Segment*	**Project (Number/Name)** 67A019 / *GPS III*

The feasibility studies and preliminary engineering analyses that are funded by this budget item will determine whether an initiative to host GPS M-Code augmentation payloads on other satellite systems is practical and beneficial. The primary goal is to provide additional mission assurance through redundant systems not directly connected with the current U.S. GPS satellite constellation.

This PE encompasses the GPS III (SVs 01-10), COps, MCEU, M-Code Hosted Payload, and prior to FY2019, GPS III Follow-On Production Readiness efforts.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: GPS III SVs 01-02	106.156	33.415	24.030
Description: Development, test, and evaluation of GPS III SVs 01-02 and associated simulators, engineering studies and analyses, trade studies, system development, test and evaluation efforts, and integrated logistics support products. ***FY 2019 Plans:*** Began the launch campaign for GPS III SV 01 mission and On-Orbit Checkout activities. Continue and finalize MRC events for SV 02, which includes launch preparation, planning, mission readiness testing to validate space-ground-user interfaces, mission crew exercises and rehearsals, launch vehicle integration, and On-Orbit Checkout preparation activities to validate performance prior to launch. Began the launch campaign for the GPS III SV 02 mission and On-Orbit Checkout activities. In addition, SV 02 continued incorporation into the GPS III launch baseline. Integration required the development and refinement of plans and procedures and procurement of special support equipment. Continued technical support for the launch processing facility at CCAFS. Continue program office support and other related support activities that may include, but are not limited to, studies, technical analysis, prototyping, etc. ***FY 2020 Plans:*** Continue on-orbit activities and engineering support for GPS III SV 01 and SV 02 to validate performance. In addition, support SV 01 and SV 02 activities that include product development through life testing, technical mission analysis, information assurance, technical support, system engineering, and mission operations. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to, program office support, studies, technical analysis, experimentation, prototyping, etc. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 decreased compared to FY 2019 by $9.385M. Justification for this decrease is described in plans above.			
Title: GPS III Follow-On (Production Readiness)	34.919	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203265F / *GPS III Space Segment*	**Project (Number/Name)** 67A019 / *GPS III*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: Under Secretary of Defense for Acquisition, Technology, and Logistics USD(AT&L) approved the first phase of a two-phased GPS III Follow-On Acquisition Strategy starting no earlier than SV 11. The strategy utilizes FY 2015-2017 RDT&E funding for the Phase 1 effort to mature three contractors'; GPS III Follow-On production designs. The Phase 1 Production Readiness Feasibility Assessment is providing data and insight into contractors GPS III Follow-On Production Design with emphasis on a mature navigation payload and production ready designs. Phase 1 requires contractors to provide a GPS III Follow-On SV and navigation payload production designs, manufacturing plans, and a navigation payload engineering brass board (hardware). ***FY 2019 Plans:*** N/A ***FY 2020 Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A			
Title: Contingency Operations (COps) ***Description:*** COps is a risk-reduction activity to maintain constellation sustainment as prescribed by the GPS III Space Vehicle Acquisition Strategy to support GPS III operations until delivery of GPS OCX. COps adds to the existing Operational Control System (OCS) Architecture Evolution Plan (AEP) command, control, maneuver planning, re-programmability, navigation functionality, USNDS support, and external interfaces for GPS III SVs. COps includes integrating GPS III SV simulation modules to the GPS System Simulator (GSS) and updates to the Positional Training Emulator (PTE). ***FY 2019 Plans:*** Complete Factory Qualification Test (FQT) and all Development Test and Evaluation activities; deliver PTE updates; conduct successful Fielding Readiness Review; handoff to sustainment; complete Operational Test Readiness Certification; complete Program Executive Officer (PEO) certification and Transition to Operations. Continue program office support and other related support activities that may include, but are not limited to, studies, technical analysis, prototyping, etc. ***FY 2020 Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 decreased compared to FY 2019 by $24.400M. Justification for this decrease is described in plans above.	47.640	24.400	0.000
Title: Architecture Evolution Plan (AEP) M-Code Monitoring	23.725	14.596	18.410

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203265F / *GPS III Space Segment*	**Project (Number/Name)** 67A019 / *GPS III*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: The M-Code Early Use (MCEU) program initiative will cover the development costs associated with updating the legacy control segment software, AEP, with additional capabilities needed to provide M-Code operations. MCEU will provide the Combined Space Operations Center (CSpOC) with command and control (C2), processing, and integrity monitoring for the M-Code signal. The development will also include the integration of modernized Monitor Station Technology Improvement Capability (MSTIC) receivers, which are being procured separately using Operations and Maintenance (O&M) funding as a Form-Fit- Functional replacement for the legacy Monitor Station Receiver Element (MSRE) Y-Code receivers. MCEU will add a software upgrade to MSTIC receivers to allow it to process M-Code signals. Prime contract was awarded to start software development and test activities; includes insertion of Legacy Hot Start, Demilitarized Zone, and Receiver Protection Profile requirements into the MCEU baseline. ***FY 2019 Plans:*** Finish software development phase and start test phase; complete Code and Unit Test; complete Component Integration Test; start and finish FQT. Continue program office support and other related support activities that may include, but are not limited to, studies, technical analysis, prototyping, etc. ***FY 2020 Plans:*** Start and finish Integrated System Test; complete Fielding Readiness Review; hold Operational Test Readiness Certification and begin Operational Test and Evaluation. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to, program office support, studies, technical analysis, experimentation, prototyping, etc. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 increased compared to FY 2019 by $3.814M. Justification for this increase is described in plans above.			
Accomplishments/Planned Programs Subtotals	212.440	72.411	42.440

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• SPAF 01 Line Item GPS III: *GPS III*	84.064	69.386	31.466	-	31.466	20.143	21.320	19.332	19.680	26.400	291.791
• SPAF 01 GPS IIIF SPAF: *GPS IIIF SPAF*	-	-	414.625	-	414.625	628.495	890.355	897.544	962.300	Continuing	Continuing
• RDTE 05 PE 1203629F: *GPS III Follow-On*	-	426.889	462.875	-	462.875	279.423	258.041	294.800	286.368	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203265F / *GPS III Space Segment*	**Project (Number/Name)** 67A019 / *GPS III*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost

Remarks

D. Acquisition Strategy

The GPS III next generation space segment (SV 01-10) rapidly and affordably responds to warfighter capability requirements. The acquisition approach utilizes a disciplined systems engineering approach which focuses on mitigating cost and schedule risk through a lower-risk incremental delivery of mature technologies. This approach focuses on mission success and on-time delivery. The GPS III SVs will have GPS IIF capabilities plus up to a 3x-8x increase in anti-jam signal power, 3x improved accuracy, 3+ year increased design life, a new civil (L1C) signal compatible with the European Galileo system, and a satellite bus capable of supporting future SV capability additions.

RDT&E funding for SVs 11 and 12 is in PE 1203269F, Project GPS IIIF. Beginning in FY 2020 SPAF funding for SVs 13-32 is captured in PE 1203269F, Project GPS IIIF.

The AF is using its research laboratories to mature an On-Orbit Reprogrammable Digital Waveform Generator (ORDWG) which provide signal flexibility to change the signal form while the satellite is on-orbit. This effort is funded with AFRL's S&T funding, PE 1203265F, and PE 1203269F (starting in FY2019) to increase the number of alternate navigation payloads and inform future PNT architectures.

On 19 July 2016, PEO Space approved the Acquisition Strategy Document (ASD) for the COps effort. The strategy enables contingency constellation sustainment capability for GPS III PNT. GPS III COps is needed because GPS OCX will not deliver in time to support initial GPS III SV operations. COps operates (post-launch and check-out) GPS III SVs at the capability level of GPS IIR-M or GPS IIF using the existing AEP control segment.

On 21 Jan 2017, PEO Space approved the Acquisition Strategy for the MCEU program. The MCEU acquisition strategy enables the GPS Enterprise to provide core M-Code capabilities to the warfighter prior to GPS OCX delivery. MCEU will also support the scheduled operational testing of MGUE. MCEU will update the GPS control segment software, AEP, to allow for command and control, processing, and integrity monitoring of the M-Code signal. MCEU acquires this capability by using the existing GPS III prime contract vehicle to modify the operational AEP software.

The Air Force approved reinstatement of a previously deferred Key Support Area (KSA) on 10 Feb 2016. The MSTIC receivers currently under development will get a software upgrade to process M-Code data. This $7.96M project to procure the M-MSTIC receivers was funded through both O&M and SPAF funds in FY 2016-FY 2018. Performance monitoring, integration, and test will be conducted by the MCEU program and sustained under the Global Positioning Operations Support and Sustainment Division contract with Lockheed Martin.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203265F / *GPS III Space Segment*	**Project (Number/Name)** 67A019 / *GPS III*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GPS III Development	C/CPIF	Lockheed Martin : Denver, CO	2,556.069	47.817	Dec 2017	6.559	Dec 2018	2.200	Dec 2018	-		2.200	9.951	2,622.596	2,617.388
GPS III SV01-02 On Orbit Incentive Fee	C/CPIF	Lockheed Martin : Denver, CO	0.000	-		3.000	Jun 2019	12.000	Jan 2020	-		12.000	6.000	21.000	21.000
GPS III Development 11+	C/Various	Lockheed Martin : Denver, CO	11.029	30.561	Oct 2018	-		-		-		-	0.000	41.590	41.590
GPS III Development_ COps	C/CPIF	Lockheed Martin : Denver, CO	63.530	45.086	Feb 2018	20.247	Feb 2019	-		-		-	0.000	128.863	128.863
GPS III Development_MCEU	C/CPIF	Lockheed Martin : Denver, CO	26.284	15.593	Oct 2017	13.767	Dec 2018	12.880	Oct 2019	-		12.880	3.633	72.157	72.157
GPS III Technical Mission Analysis	MIPR	Various : Various	18.348	6.543	Oct 2017	5.603	Dec 2018	6.614	Oct 2019	-		6.614	11.845	48.953	-
GPS III Enterprise SE&I	C/CPAF	TASC : El Segundo, CA	89.900	6.658	Nov 2017	2.162	May 2019	1.743	Oct 2019	-		1.743	0.000	100.463	100.463
GPS III Launch Support	RO	45th : Cape Canaveral, FL	28.512	39.930	Mar 2018	13.601	Mar 2019	-		-		-	16.500	98.543	82.043
GPS III Production SMI	C/CPFF	TBD : TBD	36.156	0.000		-		-		-		-	0.000	36.156	36.153
GPS III Enterprise Ground Service	C/CPAF	N/A : N/A	7.500	-		-		-		-		-	0.000	7.500	7.500
		Subtotal	2,837.328	192.188		64.939		35.437		-		35.437	47.929	3,177.821	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GPS III T&E	Various	Various : TBD	32.662	3.462	Apr 2018	-		-		-		-	0.000	36.124	-
		Subtotal	32.662	3.462		-		-		-		-	0.000	36.124	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203265F / *GPS III Space Segment*	Project (Number/Name) 67A019 / *GPS III*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GPS III FFRDC	MIPR	Various : El Segundo, CA	109.215	2.019	Apr 2018	2.429	Apr 2019	2.349	Apr 2020	-		2.349	5.000	121.012	-
GPS III A&AS	Various	Various : Various	110.895	14.000	Apr 2018	4.343	Apr 2019	4.054	Apr 2020	-		4.054	6.800	140.092	-
GPS III Other Support	Various	Various : Various	12.201	0.771	Oct 2017	0.700	Oct 2018	0.600	Oct 2018	-		0.600	0.100	14.372	-
		Subtotal	232.311	16.790		7.472		7.003		-		7.003	11.900	275.476	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	3,102.301	212.440		72.411		42.440		-		42.440	59.829	3,489.421	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203265F / *GPS III Space Segment*	**Project (Number/Name)** 67A019 / *GPS III*

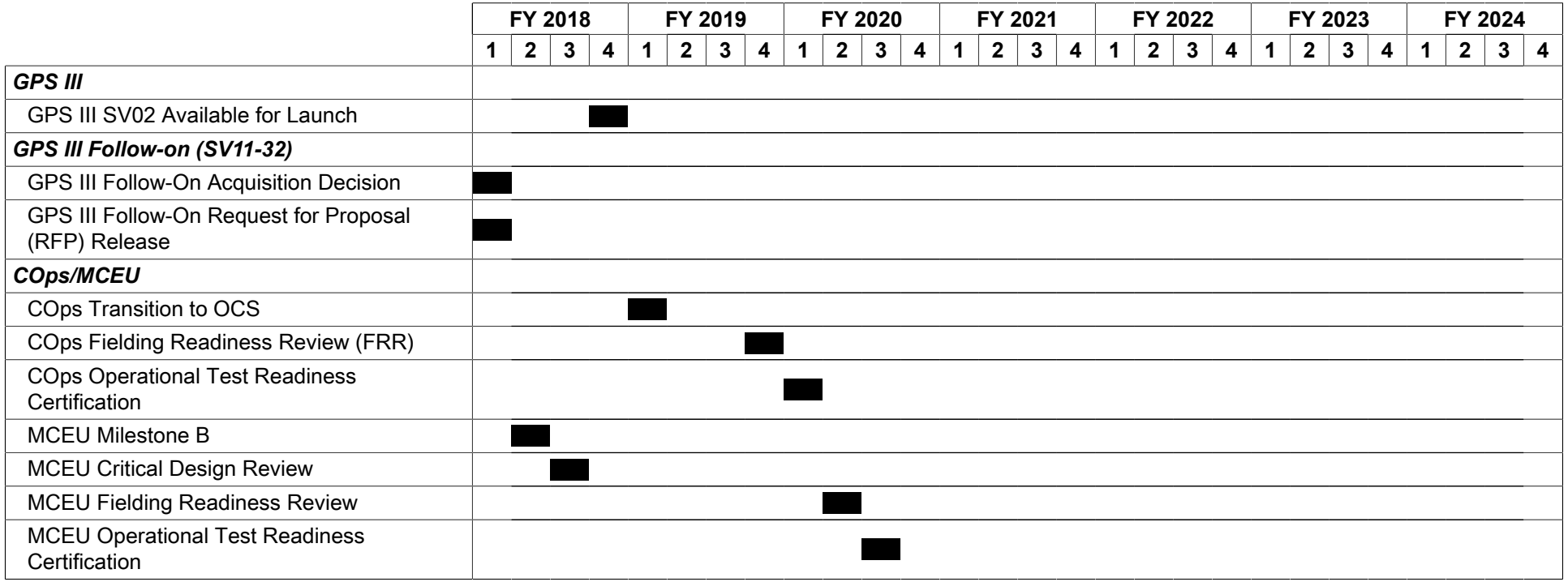

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203265F / *GPS III Space Segment*	**Project (Number/Name)** 67A019 / *GPS III*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
GPS III				
GPS III SV02 Available for Launch	4	2018	4	2018
GPS III Follow-on (SV11-32)				
GPS III Follow-On Acquisition Decision	1	2018	1	2018
GPS III Follow-On Request for Proposal (RFP) Release	1	2018	1	2018
COps/MCEU				
COps Transition to OCS	1	2019	1	2019
COps Fielding Readiness Review (FRR)	4	2019	4	2019
COps Operational Test Readiness Certification	1	2020	1	2020
MCEU Milestone B	2	2018	2	2018
MCEU Critical Design Review	3	2018	3	2018
MCEU Fielding Readiness Review	2	2020	2	2020
MCEU Operational Test Readiness Certification	3	2020	3	2020

Note

COps/MCEU schedule milestones adjusted to match approved Acquisition Program Baseline dated 26 April 2018

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 1203400F / *Space Superiority Intelligence*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	10.691	16.278	14.428	0.000	14.428	16.841	18.371	18.301	17.779	Continuing	Continuing
67A051: *Space Superiority - Advanced Intelligence Systems*	-	10.691	16.278	14.428	0.000	14.428	16.841	18.371	18.301	17.779	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Space Superiority Intelligence program provides Intelligence, Surveillance, and Reconnaissance (ISR) and Electronic Support (ES) for key find, fix, track, target, engage and assess (F2T2EA) requirements supporting Space Superiority activities meeting Combatant Command (CCMD) needs. SSI funds developmental intelligence activities to support new space superiority capability acquisition and development. Funds associated developmental ISR planning and direction, collection, processing and exploitation, analysis and production, dissemination and integration (PCPAD) capabilities providing Battlespace Awareness and SSA in support of Space Superiority and Space Control. This includes funding for fixed and transportable intelligence collection, processing/exploitation and dissemination (PED), analysis and production capabilities that are modular (plug-and-play), meet Risk Management Framework Accreditation requirements and can keep pace with technological advances and emerging threats. It provides intelligence support systems for Space Situational Awareness activities that provide the requisite current and predictive knowledge of space events and threat conditions and intelligence support to Space Protection Programs by providing architectural survivability analysis of critical mission assets for mission assurance, as well as network analysis. It also supports specialized/tailored, phased threat system analysis and studies (A&S), test support, lab equipment, and Material Acquisition and Exploitation (MAE) for system development, vulnerability, susceptibility assessments to support tactics, techniques and procedures (TTP) development and future threat technology studies necessary for mission area success and achievement of space superiority, and to preserve the US space advantage across all domains.

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

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

The FY 2020 funding request was reduced by $2.088 million to account for the availability of prior year execution balances.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203400F / *Space Superiority Intelligence*

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	12.691	16.278	16.516	0.000	16.516
Current President's Budget	10.691	16.278	14.428	0.000	14.428
Total Adjustments	-2.000	0.000	-2.088	0.000	-2.088
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	-2.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	-2.088	0.000	-2.088

Change Summary Explanation

FY 2018: -$2.000M Congressional reduction for insufficient justification
FY 2020: -$2.088M reduction for execution rephase

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Advanced Intelligence Systems for Space Superiority	10.691	16.278	14.428
Description: Develops transportable and fixed PCPAD capabilities. ***FY 2019 Plans:*** Continue Space Superiority RDT&E through transformation of collection and production activities by developing an intelligence architecture capable of front-end collection and analysis of new technologies in near real-time. This capability will be expanded across the Special Missions Enterprise to allow access to sensitive information from each point of presence providing production analysts the ability to rapidly exploit known vulnerabilities and develop new capabilities to counter adversary technological advances.			

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203400F / *Space Superiority Intelligence*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, prototyping, etc. ***FY 2020 Plans:*** Continue Space Superiority RDT&E through transformation of collection and production activities by developing an intelligence architecture capable of front-end collection and analysis of new technologies in near real-time. This capability will be expanded across the Special Missions Enterprise to allow access to sensitive information from each point of presence providing production analysts the ability to rapidly exploit known vulnerabilities and develop new capabilities to counter adversary technological advances. Intelligence, Surveillance, and Reconnaissance (ISR) capabilities will be further developed to enhance automation and respond more quickly to ISR for Space needs. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, prototyping, etc. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 decreased compared to FY 2019 by $1.85M. Justification for this decrease is an execution rephrase in FY 2020.			
Accomplishments/Planned Programs Subtotals	10.691	16.278	14.428

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

All contracts funded in this program will be awarded using competitive procedures to the maximum extent possible.

Space Superiority and R&D Intelligence Development: Single Delivery, CPFF, advisory and assistance contractor supporting development efforts. Prime contractor is Macaulay-Brown.

Architecture upgrades to SSA, SSDP, and Space Superiority: Multiple Delivery, CPFF integration contract. Prime contractor is BITSYSTEMS Data Analysis

Production development for R&D: Multiple Delivery, CPFF production contract supporting vulnerabilities analysis. Prime Contractor is Booz-Allen Hamilton Intelligence systems

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203400F / *Space Superiority Intelligence*

Testing and data collection: Multiple Delivery, CPFF production contract providing independent validation and verification of new capability development. Prime contractor is Booz-Allen Hamilton.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203400F / *Space Superiority Intelligence*	**Project (Number/Name)** 67A051 / *Space Superiority - Advanced Intelligence Systems*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Space Superiority and R&D intelligence Development	Various	Various : TBD	-	2.541	Nov 2017	2.800	Nov 2018	2.840	Nov 2019	-		2.840	Continuing	Continuing	-
Architecture upgrades to SSA, SPP, and Space Superiority	Various	Various : TBD	-	3.550	Nov 2017	6.058	Nov 2018	5.100	Nov 2019	-		5.100	Continuing	Continuing	-
Data analysis and product development for R&D	Various	Various : TBD	-	4.100	Nov 2017	5.800	Nov 2018	4.838	Nov 2019	-		4.838	Continuing	Continuing	-
Intelligence systems testing and data collection	Various	Various : TBD	-	0.500	Nov 2017	0.800	Nov 2018	0.810	Nov 2019	-		0.810	Continuing	Continuing	-
Missile Defeat Enterprise Development	Various	Various : TBD	-	-		-		-		-		-	Continuing	Continuing	-
		Subtotal	-	10.691		15.458		13.588		-		13.588	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
A&AS	Various	Various : TBD	-	0.000		0.820	Nov 2017	0.840	Nov 2018	-		0.840	Continuing	Continuing	-
		Subtotal	-	0.000		0.820		0.840		-		0.840	Continuing	Continuing	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	10.691		16.278		14.428		-		14.428	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203400F / *Space Superiority Intelligence*	**Project (Number/Name)** 67A051 / *Space Superiority - Advanced Intelligence Systems*

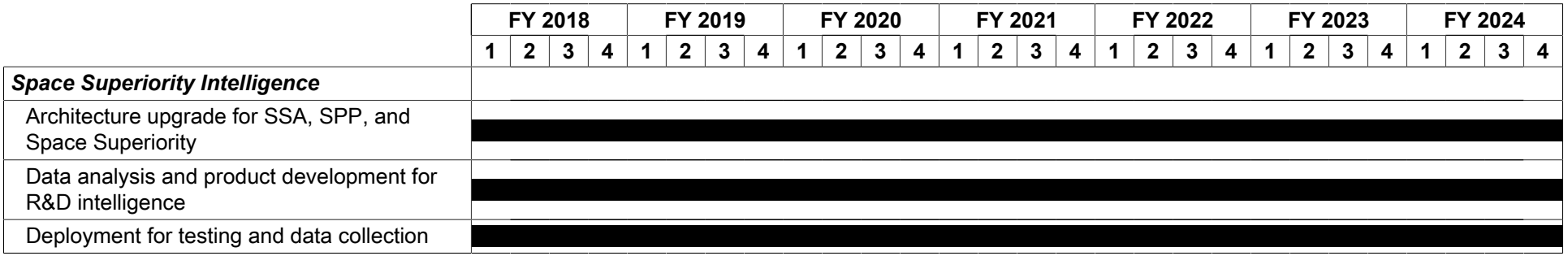

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203400F / *Space Superiority Intelligence*	**Project (Number/Name)** 67A051 / *Space Superiority - Advanced Intelligence Systems*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Space Superiority Intelligence				
Architecture upgrade for SSA, SPP, and Space Superiority	1	2018	4	2024
Data analysis and product development for R&D intelligence	1	2018	4	2024
Deployment for testing and data collection	1	2018	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 1203614F / *JSpOC Mission System*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	125.191	70.383	72.762	0.000	72.762	103.870	108.070	105.986	72.372	Continuing	Continuing
67A030: *Infrastructure*	0.000	27.107	11.914	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	39.021
67A031: *Mission Applications*	0.000	15.081	11.717	0.001	0.000	0.001	0.000	0.001	0.000	0.000	0.000	26.800
67A035: *Enterprise Space BMC2*	0.000	83.003	46.752	72.761	0.000	72.761	103.870	108.069	105.986	72.372	Continuing	Continuing
Program MDAP/MAIS Code: N82												

Note

Projects 67A030 and 67A031, JMS Infrastructure and Mission Applications, are complete in FY 2019. The $0.001M entries in Project 67A031 in FY 2020 and FY 2022 are the result of a database error.

A. Mission Description and Budget Item Justification

The Air Force is developing a Space Command and Control (C2) and Space Situational Awareness (SSA) capability for the Joint Force Space Component Commander (JFSCC). The enterprise-wide system will provide a common government infrastructure and standards for rapid prototyping of dynamic SSA and Battle Management Command and Control (BMC2) applications to address the evolving and dynamic threat. The system will provide a collaborative environment that will enhance and modernize SSA and BMC2 capabilities; create decision-relevant views of the space environment; rapidly detect, track and characterize objects of interest; identify / exploit traditional and non-traditional sources; perform space threat analysis; and enable efficient distribution of data across the Space Surveillance Network (SSN). Funding includes technical studies, development, experimentation, integration and related support costs.

In the FY 2019 budget, Project 67A035 ESBMC2 received a Congressional rescission of $30.000M. The correct total for FY 2018 is $53.003M

In Project 67A035, Enterprise Space BMC2, the FY 2020 funding request was reduced by $30.000 million to account for the availability of prior year execution balances.

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

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

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203614F / *JSpOC Mission System*

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	99.455	72.256	102.762	0.000	102.762
Current President's Budget	125.191	70.383	72.762	0.000	72.762
Total Adjustments	25.736	-1.873	-30.000	0.000	-30.000
• Congressional General Reductions	0.000	-1.873			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	30.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-4.264	0.000			
• Other Adjustments	0.000	0.000	-30.000	0.000	-30.000

Change Summary Explanation

FY 2018: $30.000M Congressional increase for Space Enterprise Defense Implementation.

In the FY 2019 budget, ESBMC2 received a Congressional rescission of $30.000M. The correct total for FY 2018 is $53.003M.

FY 2020: $30.000M decrease due to availability of prior year execution balances.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203614F / *JSpOC Mission System*	Project (Number/Name) 67A030 / *Infrastructure*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
67A030: *Infrastructure*	0.000	27.107	11.914	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	39.021
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2019, Project 67A030, JMS Infrastructure, are complete.

A. Mission Description and Budget Item Justification

Infrastructure provides a Service Oriented Architecture (SOA), net-centric collaborative information environment at the Unclassified, Secret, and Top Secret / Sensitive Compartmented Information (TS/SCI) levels. Efforts incorporate net-centric enterprise services and integrating incremental space mission applications services. Priority is migration off the legacy SPADOC hardware and services into a sustainable infrastructure. Effort integrates components of SSA mission applications and C2 capabilities into the JSpOC to create timely, actionable knowledge necessary for maintaining space superiority and exercising command and control of space forces.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Increment 2	27.107	11.914	0.000
Description: Pursues and integrates a collaborative net-centric, SOA information environment. ***FY 2019 Plans:*** JMS Increment 2 SP-9 was completed with limited operational acceptance and the program will transfer to operational sustainment. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Continue program office support and other related support activities that may include, but are not limited to studies, technical analysis, prototyping, etc. ***FY 2020 Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	27.107	11.914	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• SPAF 01 Line Item 836790: *Space Mods Space*	3.850	20.366	16.954	-	16.954	14.726	15.021	15.301	15.671	120.952	222.841

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203614F / *JSpOC Mission System*	**Project (Number/Name)** 67A030 / *Infrastructure*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost

Remarks

Replaces JMS components and provides an operational, sustainable environment to maintain capabilities that fuse data from space intelligence, surveillance, reconnaissance, and environmental sources. This modification will procure commercial hardware, software licenses, and warranties to upgrade the operational environment enclaves (2 Secret / 2 TS/SCI), as well as keep up to date development/operational testing locations.

D. Acquisition Strategy

The JMS overarching Acquisition Strategy, approved by the Milestone Decision Authority on April 15, 2012, provides for a multi-increment program to develop, integrate, test, and deliver JMS capability. The acquisition strategy reflects new principles that address the speed, agility, and adaptability required for successful Information Technology (IT) acquisition resulting in a tailored incremental acquisition approach to deliver early and often by leveraging mature industry capabilities and taking advantage of previous Government investments in Federally Funded Research and Development Center (FFRDC) and Government lab prototyping efforts.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203614F / *JSpOC Mission System*	**Project (Number/Name)** 67A030 / *Infrastructure*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JMS SOA, Infrastructure and core service development	Various	Various : Various	0.000	-		-		-		-		-	0.000	0.000	-
JMS High-performance computing and security infrastructure development	Various	Various : Various	0.000	-		-		-		-		-	0.000	0.000	-
JMS Government Capability Providers	Various	Various : Various	0.000	-		-		-		-		-	0.000	0.000	-
JMS Enterprise SEI	Various	Various : Various	0.000	24.477	Nov 2017	8.884	Nov 2018	-		-		-	0.000	33.361	43.165
JMS Mission Infrastructure	Various	Various : Various	0.000	-		-		-		-		-	0.000	0.000	0.200
JMS Net-Centric Sensors and Data Sources	Various	Various : Various	0.000	-		-		-		-		-	0.000	0.000	-
JMS Standard Space Trainer	C/CPFF	Sonalyst : Colorado Springs, CO	0.000	-		-		-		-		-	0.000	0.000	-
JMS Integration & Acq Logistics	Various	SPAWAR : San Diego, CA	0.000	-		-		-		-		-	0.000	0.000	-
ESBMC2 Government Capability Development	Various	Various : Various	0.000	-		-		-		-		-	0.000	0.000	-
		Subtotal	0.000	24.477		8.884		-		-		-	0.000	33.361	N/A

Remarks

Cost table amounts in FY2018 are incorrect in PRCP. The FY2018 $30M congressional increase should be applied against Project 67A035, Enterprise Space BMC2 instead of 67A030, JMS Inc 2 Infrastructure. Actual total for Project 67A035 is $85.830M and for Project 67A030, Infrastructure, is $28.030M. $30M has been in included in this R-3 but will be moved to correct project prior to FY2020 PB submission.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
A&AS	Various	Various : Various	0.000	2.630	Jan 2018	3.030	Nov 2018	-		-		-	0.000	5.660	3.656
FFRDC	Various	Various : Various	0.000	-		-		-		-		-	0.000	0.000	-
		Subtotal	0.000	2.630		3.030		-		-		-	0.000	5.660	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203614F / *JSpOC Mission System*	Project (Number/Name) 67A030 / *Infrastructure*	

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	27.107		11.914		-		-		-	0.000	39.021	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203614F / *JSpOC Mission System*	**Project (Number/Name)** 67A030 / *Infrastructure*

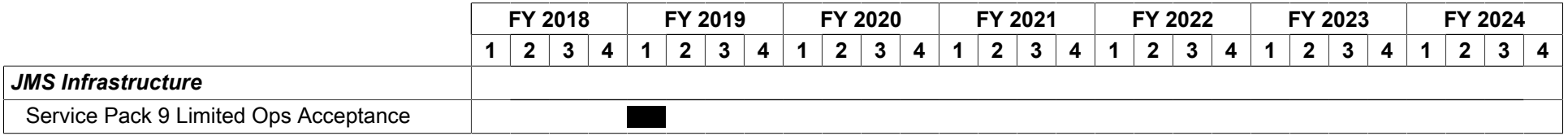

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203614F / *JSpOC Mission System*	**Project (Number/Name)** 67A030 / *Infrastructure*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
JMS Infrastructure				
Service Pack 9 Limited Ops Acceptance	1	2019	1	2019

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203614F / *JSpOC Mission System*	Project (Number/Name) 67A031 / *Mission Applications*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
67A031: *Mission Applications*	0.000	15.081	11.717	0.001	0.000	0.001	0.000	0.001	0.000	0.000	0.000	26.800
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2019, Project 67A031, Mission Applications, is complete. The $0.001M entries in FY 2020 and FY 2022 are the result of a database error.

A. Mission Description and Budget Item Justification

Mission applications provides space services to enhance the accuracy, sustainability, and responsiveness of space surveillance capabilities by providing the knowledge environment necessary to enable the Joint Force Space Component Commander to make rapid, responsive decisions for the protection of space assets from proliferating threats (adversary as well as orbiting debris). The system provides a high accuracy space catalog (knowledge of space objects), increased observation verification and capabilities, and improved event processing. Research, development, and system design provides SSA space catalog applications, services, space surveillance observation processing, and sensor tasking. Funding includes technical studies, development, and integration.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Increment 2	15.081	11.717	0.001
Description: Services/mission applications to conduct space control/situational awareness. ***FY 2019 Plans:*** JMS Increment 2 SP-9 was completed with limited operational acceptance and the program will transfer to operational sustainment. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc. ***FY 2020 Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	15.081	11.717	0.001

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203614F / *JSpOC Mission System*	**Project (Number/Name)** 67A031 / *Mission Applications*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• SPAF 01 Line Item 836790: *Space Mods Space*	3.850	20.366	16.954	-	16.954	14.726	15.021	15.301	15.671	120.952	222.841

Remarks

D. Acquisition Strategy

The JMS overarching Acquisition Strategy, approved by the Milestone Decision Authority on April 15, 2012, provides for a multi-increment program to develop, integrate, test, and deliver JMS capability. The acquisition strategy reflects new principles that address the speed, agility, and adaptability required for successful IT acquisition resulting in a tailored incremental acquisition approach to deliver early and often by leveraging mature industry capabilities and taking advantage of previous Government investments in Federally Funded Research and Development Center (FFRDC) and Government lab prototyping efforts.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203614F / *JSpOC Mission System*	Project (Number/Name) 67A031 / *Mission Applications*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JMS Enterprise SEI	Various	Various : Various	0.000	3.964	Nov 2017	-		0.001	Dec 2018	-		0.001	0.000	3.965	5.583
JMS Technical Mission Analysis (WS)	Various	Various : Various	0.000	0.357	Oct 2017	0.182	Jan 2019	-		-		-	0.000	0.539	1.475
JMS COTS hardware, software purchase and engineering support	Various	Various : Various	0.000	6.693	Oct 2017	7.108	Nov 2018	-		-		-	0.000	13.801	13.710
		Subtotal	0.000	11.014		7.290		0.001		-		0.001	0.000	18.305	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JMS Technical Support	Various	Various : Various	0.000	-		-		-		-		-	0.000	0.000	0.634
		Subtotal	0.000	-		-		-		-		-	0.000	0.000	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Combined Developmental Test / Operational Test	Various	Various : Various	0.000	1.216	May 2018	0.723	Feb 2019	-		-		-	0.000	1.939	2.016
Combined Test Facility	Various	Various : Various	0.000	1.135	Nov 2017	0.610	Dec 2018	-		-		-	0.000	1.745	1.820
		Subtotal	0.000	2.351		1.333		-		-		-	0.000	3.684	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
A&AS	Various	Various : Various	0.000	0.798	May 2018	0.834	Nov 2018	-		-		-	0.000	1.632	1.788
FFRDC	Various	Various : Various	0.000	0.798	Aug 2018	2.105	Dec 2018	-		-		-	0.000	2.903	1.598
Other Support	Various	Various : Various	0.000	0.120	Oct 2017	0.155	Oct 2018	-		-		-	0.000	0.275	0.175

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203614F / *JSpOC Mission System*	Project (Number/Name) 67A031 / *Mission Applications*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	0.000	1.716		3.094		-		-		-	0.000	4.810	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	15.081		11.717		0.001		-		0.001	0.000	26.799	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203614F / *JSpOC Mission System*	**Project (Number/Name)** 67A031 / *Mission Applications*

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
JMS Mission Applications																												
Service Pack 9 Limited Operational Acceptance					■																							

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203614F / *JSpOC Mission System*	**Project (Number/Name)** 67A031 / *Mission Applications*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
JMS Mission Applications				
Service Pack 9 Limited Operational Acceptance	1	2019	1	2019

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203614F / *JSpOC Mission System*	Project (Number/Name) 67A035 / *Enterprise Space BMC2*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
67A035: *Enterprise Space BMC2*	0.000	83.003	46.752	72.761	0.000	72.761	103.870	108.069	105.986	72.372	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Enterprise provides a SSA & BMC2 System that allows JFSCC to meet dynamic and emerging threats. Continuously develop capabilities that include, but are not limited to, SSA, battle space awareness, dynamic planning and tasking, create an interactive modeling and simulation environment to support training and exercises, collaborative data sharing, and Course of Action (COA) development and assessment. Funding includes technical studies, development, experimentation, systems engineering, integration and related support costs.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Enterprise Space BMC2	83.003	46.752	72.761

Description: This program delivers a robust and responsive Space Situational Awareness (SSA) and Battle Management Command and Control (BMC2) capability to meet emerging threats. The program will deliver capability for decision makers trying to prevent a conflict from extending to space, or winning it if it does. Capabilities and associated infrastructure include, but are not limited to, SSA, Indications & Warning (I&W), Transmit/Receive, Space Control, Tactical Operations and Common Platforms and Infrastructure, Cyber and Threat Warning. Other activities include dedicated Systems Engineering & Integration (SE&I), Test & Evaluation (T&E), Model Based Systems Engineering (MBSE) and prototype Validation & Verification to support these efforts.

FY 2019 Plans:

Continue developmental planning and contracting efforts to include, but not limited to, program support, systems engineering, design, technical maturation and risk reduction, prototyping and integration of Enterprise Space BMC2 commercial, industry and government capabilities including infrastructure. Continue to enhance and modernize prototype capabilities in the National Space Defense Center and the Joint Space Operations Center and other operations centers supporting or supported by space capabilities. End-to-end systems engineering requirements flow down and verification planning for Space Enterprise BMC2. Effort includes critical integration of all activities needed to support the kill chain. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc.

FY 2020 Plans:

Plan and develop architecture which is Open Mission Standard (OMS) and Unmanned Aerospace Systems Command and Control (C2) Standards Initiative (UCI) compliant to support both the Space Situational Awareness (SSA) and Battle Management Command and Control (BMC2) missions to meet dynamic emerging threats. The architecture and infrastructure will modernize and deliver new capabilities in the National Space Defense Center, Combined Space Operations Center and other operations

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203614F / *JSpOC Mission System*	**Project (Number/Name)** 67A035 / *Enterprise Space BMC2*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
centers supporting SSA and BMC2. In addition to the OMS and UCI architectural efforts, SMC will continue developmental, system engineering and contracting efforts to integrate best in breed commercial, contractor and government applications for the OMS and UCI based ESBMC2 foundational architecture through the release of multiple incremental software capability drops throughout FY 2020. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 increased compared to FY 2019 by $26.009M. Justification for this increase is described in the plans above.			
Accomplishments/Planned Programs Subtotals	83.003	46.752	72.761

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• SPAF 01 SPCMOD: *Space Mods*	-	-	16.954	-	16.954	14.726	15.021	15.301	15.671	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Air Force is in developmental planning of the acquisition strategy for the system to support Space Situational Awareness (SSA) and Battle Management Command and Control (BMC2) capabilities. The program emphasizes agile software development based on Open Mission System/Universal Control and Interface (OMS/UCI) architecture. This open architecture will be a foundational component for the program's acquisition strategy which focuses on rapidly delivering capability to warfighters, leveraging commercial, industry and government partners.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203614F / *JSpOC Mission System*	Project (Number/Name) 67A035 / *Enterprise Space BMC2*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ESBMC2 Tools	Various	Various : Various	0.000	20.205	Mar 2018	12.908	Nov 2018	-		-		-	Continuing	Continuing	-
ESBMC2 Government Capability Development	Various	Various : Various	0.000	29.102	Apr 2018	12.143	Nov 2018	-		-		-	Continuing	Continuing	-
ESBMC2 Enterprise Systems Engineering & Integration	Various	Various : Various	0.000	20.030	Feb 2018	10.298	Dec 2018	21.751	Dec 2019	-		21.751	Continuing	Continuing	-
ESBMC2 Technical Mission Analysis (WS)	MIPR	Various : Various	0.000	1.668	Nov 2017	0.832	Nov 2018	1.285	Nov 2019	-		1.285	Continuing	Continuing	-
Catalyst Campus/PaaS	C/TBD	Not specified. : TBD	0.000	-		-		19.047	Jan 2020	-		19.047	0.000	19.047	-
Commercial Capability	C/Various	Not specified. : TBD	0.000	-		-		5.322	Dec 2019	-		5.322	0.000	5.322	-
Dynamic SSA Integration	C/TBD	Not specified. : TBD	0.000	-		-		5.336	Nov 2019	-		5.336	0.000	5.336	-
Weapon System Integration	C/TBD	Not specified. : TBD	0.000	-		-		4.729	Feb 2020	-		4.729	0.000	4.729	-
		Subtotal	0.000	71.005		36.181		57.470		-		57.470	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Civilian Reimbursable Budget Authority	RO	SMC : El Segundo, CA	0.000	0.173	Jan 2018	0.351	Jan 2019	0.361	Jan 2020	-		0.361	Continuing	Continuing	-
		Subtotal	0.000	0.173		0.351		0.361		-		0.361	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test	TBD	TBD : TBD	0.000	-		-		2.417	Mar 2020	-		2.417	0.000	2.417	-
		Subtotal	0.000	-		-		2.417		-		2.417	0.000	2.417	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203614F / *JSpOC Mission System*	Project (Number/Name) 67A035 / *Enterprise Space BMC2*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
A&AS	C/FFP	Various : Various	0.000	4.765	Jan 2018	6.381	Nov 2018	8.157	Nov 2019	-		8.157	Continuing	Continuing	-
FFRDC	Various	Various : Various	0.000	6.900	Nov 2017	3.639	Nov 2018	4.156	Nov 2019	-		4.156	Continuing	Continuing	-
Other Support	Various	Various : Various	0.000	0.160	Oct 2017	0.200	Oct 2018	0.200	Oct 2019	-		0.200	Continuing	Continuing	-
		Subtotal	0.000	11.825		10.220		12.513		-		12.513	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	83.003		46.752		72.761		-		72.761	Continuing	Continuing	N/A

Remarks

In the FY 2019 budget, ESBMC2 received a Congressional rescission of $30.000M. The correct total for FY 2018 is $53.003M.

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203614F / *JSpOC Mission System*	**Project (Number/Name)** 67A035 / *Enterprise Space BMC2*

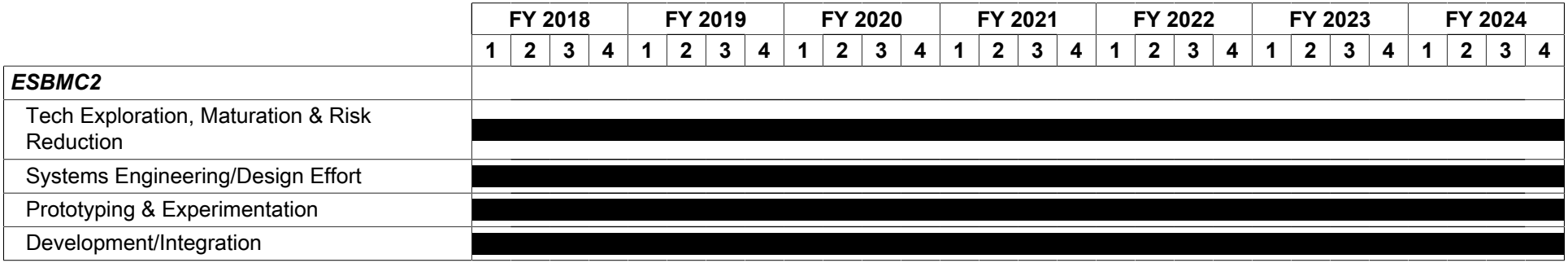

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203614F / *JSpOC Mission System*	**Project (Number/Name)** 67A035 / *Enterprise Space BMC2*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ESBMC2				
Tech Exploration, Maturation & Risk Reduction	1	2018	4	2024
Systems Engineering/Design Effort	1	2018	4	2024
Prototyping & Experimentation	1	2018	4	2024
Development/Integration	1	2018	4	2024

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 1203620F / *National Space Defense Center*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	18.052	55.309	2.653	0.000	2.653	2.692	2.755	2.805	0.000	Continuing	Continuing
670004: *OTHER STRATCOM ACTIVITIES*	-	0.000	55.309	2.653	0.000	2.653	2.692	2.755	2.805	0.000	Continuing	Continuing
67A035: *Enterprise Space BMC2*	-	18.052	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Note

Prior to FY2019, the funding for the National Space Defense Center was in PE 1203940F, Space Situational Awareness Operations, Project 670004, Other STRATCOM Activities

In FY2019, PE 1203620F, National Space Defense Center, Project 67A035, Enterprise Space BMC2 efforts were transferred to PE 1203620F, National Space Defense Center, Project 670004, Other STRATCOM activities to provide program transparency.

A. Mission Description and Budget Item Justification

This program will develop, upgrade and field the National Space Defense Center's (NSDC) operational infrastructure integrating mission partner networks, data and other hardware and software solutions into NSDC's technical baseline. Additionally, this program will provide for agile requirement development, and operational and developmental test activities supporting software Development in Operations (DevOps). The NSDC allows the national security space community to effectively respond to potential future space threat events and will have the capability to develop, test, and integrate new space system tactics, techniques and procedures (TTPs) in support of both DoD and Intelligence Community operations.

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

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force					Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*		R-1 Program Element (Number/Name) PE 1203620F / *National Space Defense Center*			
B. Program Change Summary ($ in Millions)	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**
Previous President's Budget	18.052	42.209	2.653	0.000	2.653
Current President's Budget	18.052	55.309	2.653	0.000	2.653
Total Adjustments	0.000	13.100	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	13.100			
• 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 2019: $13.100M Congressional increase for Shadow Operations, BMC2 Application, and Commercially Augmented Mission Operations development.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203620F / *National Space Defense Center*	Project (Number/Name) 670004 / *OTHER STRATCOM ACTIVITIES*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
670004: *OTHER STRATCOM ACTIVITIES*	-	0.000	55.309	2.653	0.000	2.653	2.692	2.755	2.805	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program will develop Battle Management and Command and Control (BMC2) applications for the National Space Defense Center (NSDC) (formerly Joint Interagency Combined Space Operations Center (JICSpOC)). In addition, this program will develop hardware and software prototypes to support US Strategic Command Joint Emergent Operational Need (ST-0006) for an Accelerated BMC2 capability. The NSDC allows the national security space community to effectively respond to potential future space threat events and will have the capability to develop, test, and integrate new space system tactics, techniques and procedures (TTPs) in support of both DoD and Intelligence Community operations.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Application Development	0.000	55.309	2.653
Description: Develop and field Space Battle Management Command and Control capabilities. ***FY 2019 Plans:*** Complete delivery of the second spiral of capabilities to NSDC operators. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc. ***FY 2020 Plans:*** FY2020 Plans: Continue to analyze and assess mission partner and Intelligence Community networks and achieve authorization to connect to NSDC infrastructure. Partner with test agency to perform developmental and operational test activities to support agile DevOps environment. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 decreased compared to FY 2019 by $52.656M. Justification is that major JEON developmental activities conclude in FY 2019. Funding in FY 2020 supports minor changes, integration, upgrades, sustainment, transition and other activities for previously NSDC JEON delivered capabilities.			
Accomplishments/Planned Programs Subtotals	0.000	55.309	2.653

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203620F / *National Space Defense Center*	**Project (Number/Name)** 670004 / *OTHER STRATCOM ACTIVITIES*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Accelerated Space BMC2 JEON (ST-0006) is led by AFRL and will utilize existing contracts (e.g. Space Security and Defense Program (SSDP)), and provide funds to other AF/DoD organizations to execute on their contracts. Additionally AFRL will initiate and utilize commercial consortiums to develop capabilities.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203620F / *National Space Defense Center*	**Project (Number/Name)** 670004 / *OTHER STRATCOM ACTIVITIES*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SHADOW OPERATIONS CENTER DEVELOPMENT	Various	Various : Colorado Springs, CO	-	-		24.967		-		-		-	Continuing	Continuing	-
BMC2 APPLICATION DEVELOPMENT	Various	Various: : Colorado Springs, CO	-	-		21.160	Oct 2018	1.000	Jan 2020	-		1.000	Continuing	Continuing	-
SYSTEM ENGINEERING	Various	Various: : Colorado Springs, CO	-	-		6.000	Oct 2018	-		-		-	Continuing	Continuing	-
		Subtotal	-	-		52.127		1.000		-		1.000	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
A&AS	Various	Various: : Colorado Springs, CO	-	-		0.500	Oct 2018	0.500	Jan 2020	-		0.500	Continuing	Continuing	-
FFRDC	Various	Various: : Colorado Springs, CO	-	-		2.682	Oct 2018	1.153	Dec 2019	-		1.153	Continuing	Continuing	-
		Subtotal	-	-		3.182		1.653		-		1.653	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		55.309		2.653		-		2.653	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203620F / *National Space Defense Center*	**Project (Number/Name)** 670004 / *OTHER STRATCOM ACTIVITIES*

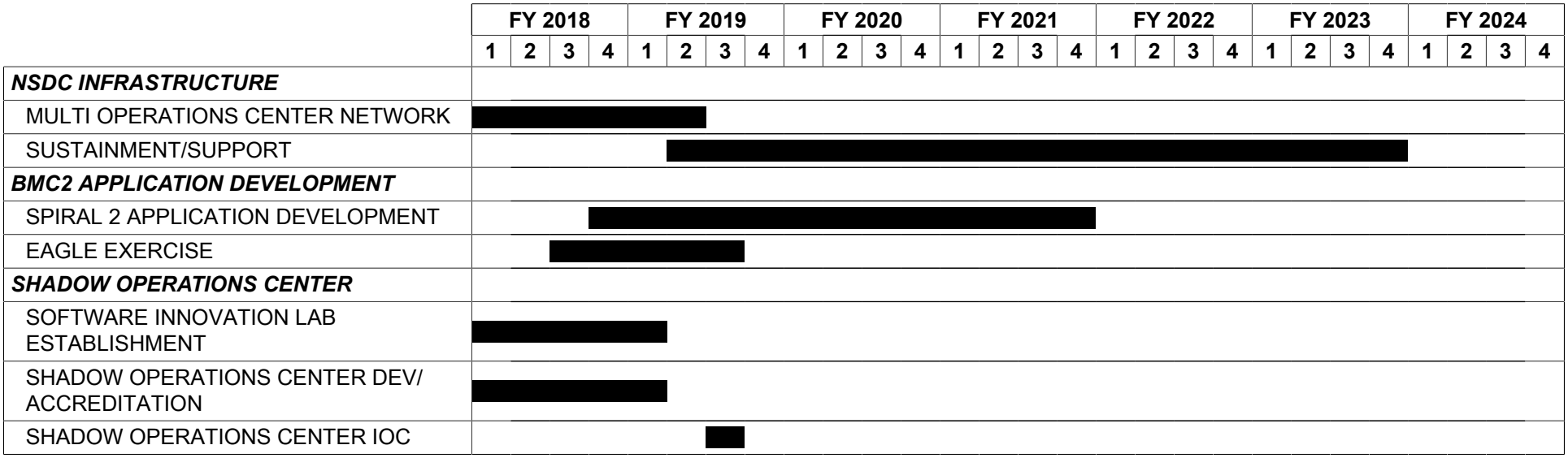

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203620F / *National Space Defense Center*	**Project (Number/Name)** 670004 / *OTHER STRATCOM ACTIVITIES*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
NSDC INFRASTRUCTURE				
MULTI OPERATIONS CENTER NETWORK	1	2018	2	2019
SUSTAINMENT/SUPPORT	2	2019	4	2023
BMC2 APPLICATION DEVELOPMENT				
SPIRAL 2 APPLICATION DEVELOPMENT	4	2018	4	2021
EAGLE EXERCISE	3	2018	3	2019
SHADOW OPERATIONS CENTER				
SOFTWARE INNOVATION LAB ESTABLISHMENT	1	2018	1	2019
SHADOW OPERATIONS CENTER DEV/ACCREDITATION	1	2018	1	2019
SHADOW OPERATIONS CENTER IOC	3	2019	3	2019

Note

FY2018 activities are funded in Project 67A035 in this PE.

Prior Year activities are funded in PE 1203940F, Project 670004.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203620F / *National Space Defense Center*	Project (Number/Name) 67A035 / *Enterprise Space BMC2*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
67A035: *Enterprise Space BMC2*	-	18.052	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program will develop Battle Management and Command and Control (BMC2) applications for the National Space Defense Center (NSDC) (formerly Joint Interagency Combined Space Operations Center (JICSpOC)). In addition, this program will develop hardware and software prototypes to support US Strategic Command Joint Emergent Operational Need (ST-0006) for an Accelerated BMC2 capability. The NSDC allows the national security space community to effectively respond to potential future space threat events and will have the capability to develop, test, and integrate new space system tactics, techniques and procedures (TTPs) in support of both DoD and Intelligence Community operations.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: BMC2 Applications	18.052	0.000	0.000
Description: Develop and field Space Battlement Management and Command and Control capabilities. ***FY 2019 Plans:*** N/A ***FY 2020 Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	18.052	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Accelerated Space BMC2 JEON (ST-0006) is led by AFRL and will utilize existing contracts e.g. Space Security and Defense Program (SSDP), and provide funds to other AF/DoD organizations to execute on their contracts. Additionally AFRL will initiate and utilize commercial consortiums to develop capabilities.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203620F / *National Space Defense Center*	**Project (Number/Name)** 67A035 / *Enterprise Space BMC2*

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203620F / *National Space Defense Center*	**Project (Number/Name)** 67A035 / *Enterprise Space BMC2*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SYSTEM ENGINEERING	Various	Various : Colorado Springs, CO	-	2.000	Oct 2017	-		-		-		-	Continuing	Continuing	-
BMC2 APPLICATION DEVELOPMENT	Various	Various : Colorado Springs, CO	-	14.000	Oct 2017	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	16.000		-		-		-		-	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
A&AS	Various	Various : Colorado Springs, CO	-	0.500	Oct 2017	-		-		-		-	Continuing	Continuing	-
FFRDC	SS/FP	Various : Colorado Springs, CO	-	1.552	Oct 2017	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	2.052		-		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	18.052		0.000		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203620F / *National Space Defense Center*	**Project (Number/Name)** 67A035 / *Enterprise Space BMC2*

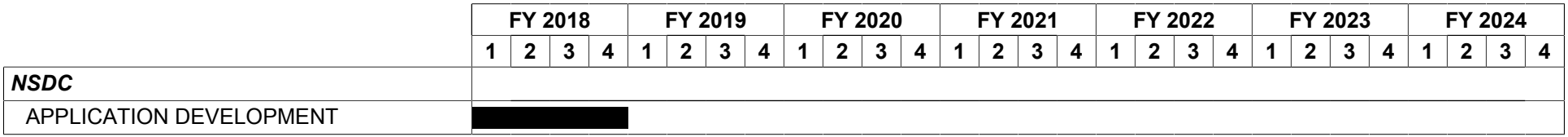

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203620F / *National Space Defense Center*	**Project (Number/Name)** 67A035 / *Enterprise Space BMC2*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
NSDC				
APPLICATION DEVELOPMENT	1	2018	4	2018

Note

FY2019-FY2023 activities are funded in Project 670004, Other STRATCOM Activities in this PE.

Prior Year activities are funded in PE 1203940F, Project 670004.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 1203699F / *Shared Early Warning (SEW)*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	1.327	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.327
674838: *Shared Early Warning System*	-	1.327	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.327
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Shared Early Warning System (SEWS) is the result of Presidential foreign policy initiatives which began in 1996. The SEWS continues to provide Theater Combatant Commanders and foreign nation customers direct operational benefit by improving the architectural design and equipment thereby providing enhanced mission capabilities (i.e., expanded coverage, emerging capability integration, etc.). Foreign customer arrangements are negotiated with individual countries on a bilateral basis to provide selected region-specific missile warning information. SEWS Integration and Test facility is kept current by enhancing systems to improve analysis of real world events. To enhance mission capability the SEWS program tests message format updates, cross domain solution updates, mandatory crypto upgrades, SEWS integration with other warning systems, and the transition to "coalition-based" warning.

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

In FY 2020, no funding is requested and no funding is required as all SEWS development was completed.

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

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203699F / *Shared Early Warning (SEW)*	

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	1.373	0.000	0.000	0.000	0.000
Current President's Budget	1.327	0.000	0.000	0.000	0.000
Total Adjustments	-0.046	0.000	0.000	0.000	0.000
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.046	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Shared Early Warning System (SEWS)	1.327	0.000	0.000	0.000	0.000
Description: SEWS development of common architecture and initiatives as identified by theater commanders.					
FY 2019 Plans: N/A					
FY 2020 Base Plans: N/A					
FY 2020 OCO Plans: N/A					
FY 2019 to FY 2020 Increase/Decrease Statement: N/A					
Accomplishments/Planned Programs Subtotals	1.327	0.000	0.000	0.000	0.000

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPAF 03 Line Item 838010: *Comm Elect Mods*	0.392	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.392

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203699F / *Shared Early Warning (SEW)*

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost

Remarks

E. Acquisition Strategy

The acquisition strategy is to build on existing capabilities using evolutionary acquisition to modernize and sustain SEWS. The program office serves as the SEW system integrator, relying on a Prime Contractor for Logistics, Operations, and Sustainment support. This contract was re-competed through full and open competition in 2017 and was awarded to a small business. The current contract has a Period of Performance (PoP) through 30 Sep 2018. Additionally, some SEWS requirements are satisfied through Military Interdepartmental Purchase Requests to external programs of record.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203699F / *Shared Early Warning (SEW)*	**Project (Number/Name)** 674838 / *Shared Early Warning System*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SEWS System Development	C/CPIF	Lockheed Martin : Colorado Springs, CO	-	0.877	Oct 2017	0.000		0.000		0.000		0.000	0.000	0.877	-
SEWS Integration and Modernization	MIPR	US Navy : San Diego, CA	-	0.195	Mar 2018	0.000		0.000		0.000		0.000	0.000	0.195	-
SEWS Additional Product Development	MIPR	Various : Colorado Springs, CO	-	0.090	Sep 2018	0.000		0.000		0.000		0.000	0.000	0.090	-
		Subtotal	-	1.162		0.000		0.000		0.000		0.000	0.000	1.162	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SEWS Systems Engineering	SS/CPFF	MITRE : Colorado Springs, CO	-	0.165	Nov 2017	0.000		0.000		0.000		0.000	0.000	0.165	-
		Subtotal	-	0.165		0.000		0.000		0.000		0.000	0.000	0.165	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	1.327		0.000		0.000		0.000		0.000	0.000	1.327	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203699F / *Shared Early Warning (SEW)*	**Project (Number/Name)** 674838 / *Shared Early Warning System*

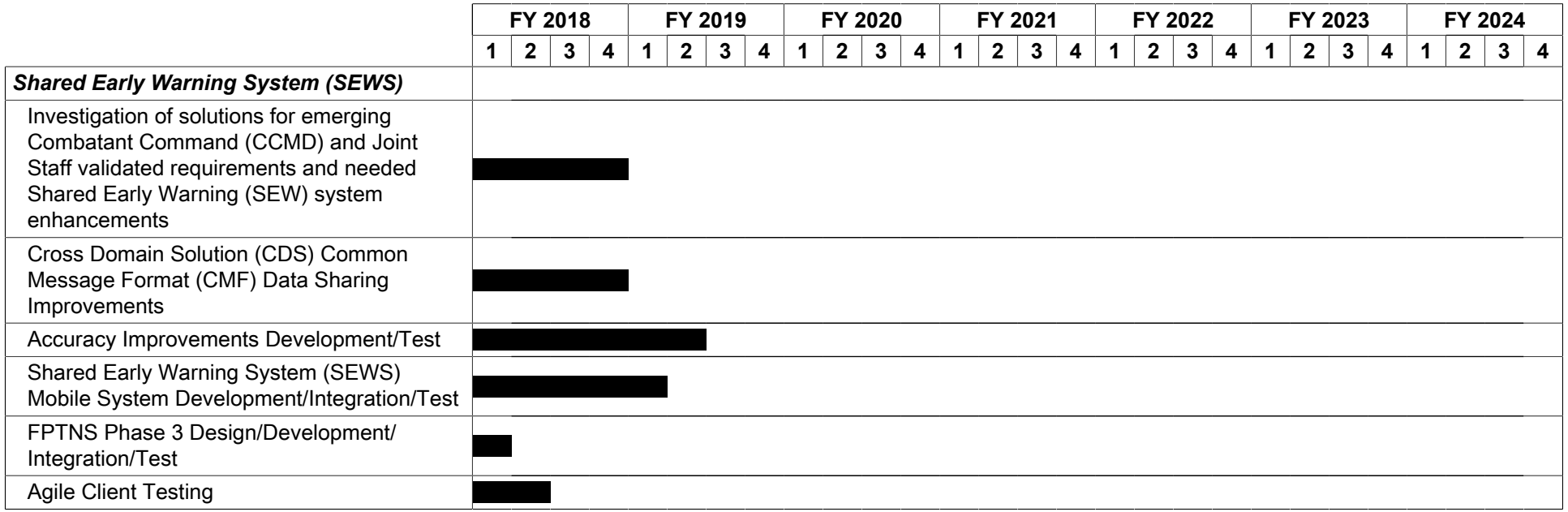

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203699F / *Shared Early Warning (SEW)*	**Project (Number/Name)** 674838 / *Shared Early Warning System*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Shared Early Warning System (SEWS)				
Investigation of solutions for emerging Combatant Command (CCMD) and Joint Staff validated requirements and needed Shared Early Warning (SEW) system enhancements	1	2018	4	2018
Cross Domain Solution (CDS) Common Message Format (CMF) Data Sharing Improvements	1	2018	4	2018
Accuracy Improvements Development/Test	1	2018	2	2019
Shared Early Warning System (SEWS) Mobile System Development/Integration/Test	1	2018	1	2019
FPTNS Phase 3 Design/Development/Integration/Test	1	2018	1	2018
Agile Client Testing	1	2018	2	2018

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203873F / *Ballistic Missile Defense Radars*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	15.881	0.000	15.881	28.188	16.084	7.944	8.087	0.000	76.184
674820: *Sensor Development*	-	0.000	0.000	15.881	0.000	15.881	28.188	16.084	7.944	8.087	0.000	76.184
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

COBRA DANE (CD) is a 40+ year old radar located on Eareckson AS, AK (Shemya Island, AK), executing two missions: Missile Defense (MD) and Space Situational Awareness (SSA). SSA mission supports New Foreign Launches (NFLs) and Space Catalog maintenance to include space debris tracking. CD will acquire through design, development, Integration, and test a modern architecture to enhance mission capability providing Warfighter and Stakeholder customers direct operational benefit. CD utilizes Federally Funded Research and Development Centers (FFRDC), Systems Engineering and Integration (SE&I), University Affiliated Research Center (UARC) and Assistance and Advisory Services Contractors to support programmatic and technical activities. Activities include studies and analysis to support both current program planning and execution and future program planning. Specifically, the Automated Data Processing Equipment (ADPE) Rehost program upgrades the CD system's radar back end mission data processing, radar management and control, and signal processing capabilities to a modern architecture that facilitates long term mission resiliency, cyber security, system viability, high operational availability, and rapid hardware and software development and deployment capability. FY17 Above Threshold Reprograming (ATR) RDT&E funds were provided to the Missile Defense Agency (MDA) to accelerate the joint Air Force and MDA modernization program of the CD radar which opens the door for a non-traditional acquisition approach using an Other Transaction Authority (OTA) agreement through the OSD Defense Innovation Unit (DIU) Organization.This program element may include necessary civilian pay expenses required to manage, execute, and deliver Cobra Dane's weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F,0605828F, 0605829F, 0605830F, 0605831F, 0605832F, and 0605898F. In addition to funds being used to modernize this back end of the radar, these funds will also be used for out-year planning of front end component modernization including enhancement of communication elements.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203873F / *Ballistic Missile Defense Radars*

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	0.000	0.000	15.881	0.000	15.881
Current President's Budget	0.000	0.000	15.881	0.000	15.881
Total Adjustments	0.000	0.000	0.000	0.000	0.000
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

Change Summary Explanation

This is not a new start program, but a continuation of effort for a joint Air Force and Missile Defense Agency program. Air Force takes over funding to continue this joint effort starting in FY20 to develop and integrate prototypes procured using FY17 ATR and FY18 MDA funding.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: ADPE Rehost Upgrade, Phase II	0.000	0.000	15.881	0.000	15.881

Description: The Automated Data Processing Equipment (ADPE) Rehost Phase II continues evolutionary, non-traditional prototype development funded under FY17 Congressional ATR and FY18 Missile Defense Agency funds into a development program. FY20 funds transition the program into the developmental and integration phase to operationalize prototypes procured using non-traditional acquisition methods which will evolve the Cobra Dane radar back end mission data processing, radar management and control, and signal processing capabilities to a modern open architecture. This architecture will facilitate long term mission resiliency, cyber security, system viability, high operational availability, and rapid hardware and software development and deployment capability.

FY 2019 Plans:

N/a

FY 2020 Base Plans:

Planned projects include software lab preparations, further development of system hardware and software, system integration and spiral development and testing. In addition to funds being used to modernize the back

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203873F / *Ballistic Missile Defense Radars*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
end of the radar, these funds may also be used for out-year planning of front end component modernization including enhancement of communication elements. ***FY 2020 OCO Plans:*** n/a ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY20 - This is a new Program Element. Funding responsibility transitions to the Air Force in FY20. Previously funded under the FY17 Congressional ATR and FY18 MDA. The funds transition the evolutionary, non-traditional prototype efforts into the developmental and integration phase to operationalize prototypes procured using non-traditional acquisition methods. The evolves the Cobra Dane radar back end mission data processing, radar management and control, and signal processing capabilities to a modern open architecture.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	15.881	0.000	15.881

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

This acquisition strategy will use a non-traditional approach to modernize and enhance existing capabilities using a non-compete follow-on award of the Defense Innovation Unit (DIU) Other Transaction Authority (OTA) Agreement in accordance with allowances provided in 10 U.S.C 2371b(f). This approach will provide an extension of system service life to ensure warfighter capability thru at least 2030. This evolutionary migration to a current open system approach also provides foundation for adaptable system sustainment and addition of future capabilities.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203873F / *Ballistic Missile Defense Radars*	Project (Number/Name) 674820 / *Sensor Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ADPE Phase II, Development; S/W & H/W integration	TBD	Various : TBD	-	0.000		0.000		15.000	Jan 2020	-		15.000	Continuing	Continuing	-
		Subtotal	-	0.000		0.000		15.000		-		15.000	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	TBD	Various : TBD	-	-		-		0.881	Mar 2020	-		0.881	Continuing	Continuing	-
		Subtotal	-	-		-		0.881		-		0.881	Continuing	Continuing	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.000		0.000		15.881		-		15.881	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203873F / *Ballistic Missile Defense Radars*	**Project (Number/Name)** 674820 / *Sensor Development*

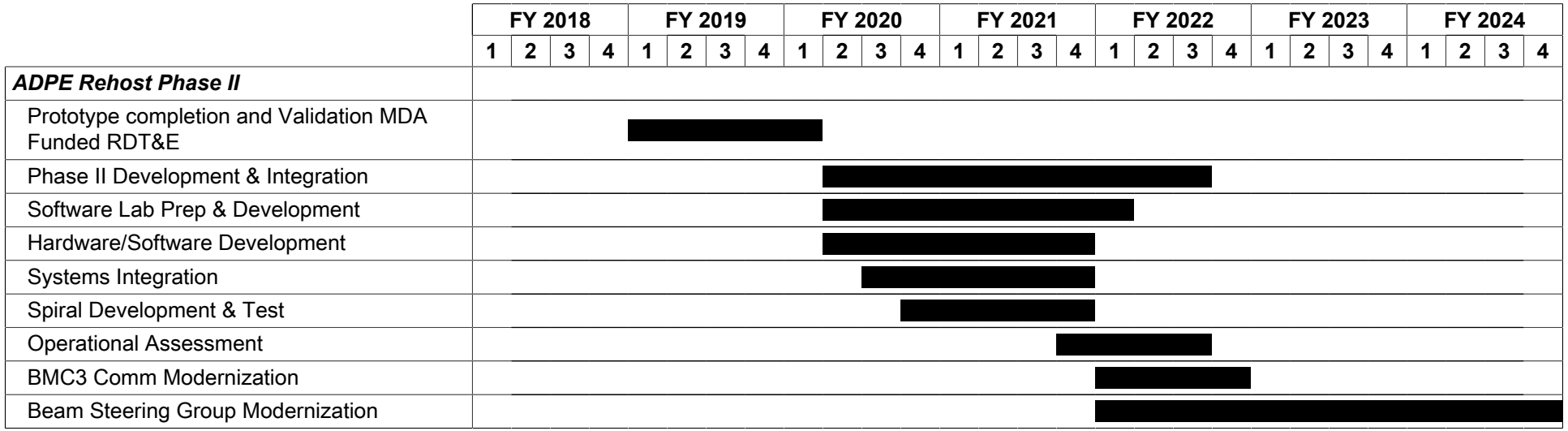

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203873F / *Ballistic Missile Defense Radars*	**Project (Number/Name)** 674820 / *Sensor Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ADPE Rehost Phase II				
Prototype completion and Validation MDA Funded RDT&E	1	2019	1	2020
Phase II Development & Integration	2	2020	3	2022
Software Lab Prep & Development	2	2020	1	2022
Hardware/Software Development	2	2020	4	2021
Systems Integration	3	2020	4	2021
Spiral Development & Test	4	2020	4	2021
Operational Assessment	4	2021	3	2022
BMC3 Comm Modernization	1	2022	4	2022
Beam Steering Group Modernization	1	2022	4	2024

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203906F / *NCMC - TW/AA System*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	5.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.000
67A051: *Space Superiority - Advanced Intelligence Systems*	-	5.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.000
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Funding in this exhibit was previously budgeted in PE 0305906F, NCMC - TW/AA System.

This program element supports development activities for the current and potential future NORAD Cheyenne Mountain Complex - Integrated Tactical Warning Attack Assessment (NCMC-ITW/AA) system providing authorities with accurate, timely, unambiguous warning and attack assessment of air, missile and space threats.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	5.000	0.000	0.000	0.000	0.000
Current President's Budget	5.000	0.000	0.000	0.000	0.000
Total Adjustments	0.000	0.000	0.000	0.000	0.000
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203906F / *NCMC - TW/AA System*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: ITW/AA AOA ***Description:*** Conduct Analysis of Alternatives (AOA) for the Integrated Tactical Warning and Attack Assessment (ITW/AA) Command and Control (C2) system.	5.000	-	-
Accomplishments/Planned Programs Subtotals	5.000	-	-

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

N/A

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203906F / *NCMC - TW/AA System*	**Project (Number/Name)** 67A051 / *Space Superiority - Advanced Intelligence Systems*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Services to Support AoA development	TBD	Not specified. : TBD	-	5.000	Feb 2018	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	5.000		-		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	5.000		0.000		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203906F / *NCMC - TW/AA System*	**Project (Number/Name)** 67A051 / *Space Superiority - Advanced Intelligence Systems*

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
AoA Development																												
AoA Development																												

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203906F / *NCMC - TW/AA System*	**Project (Number/Name)** 67A051 / *Space Superiority - Advanced Intelligence Systems*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
AoA Development				
AoA Development	1	2018	4	2018

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 1203913F / *NUDET Detection System (SPACE)*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	31.304	19.778	49.300	0.000	49.300	14.162	14.456	14.719	0.000	Continuing	Continuing
672808: *Nuc Detonation Det Sys (sensors)*	-	31.304	19.778	49.300	0.000	49.300	14.162	14.456	14.719	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 7, PE 1203913F, project 672808, USNDS 7, is a new start.

A. Mission Description and Budget Item Justification

The United States Nuclear Detonation (NUDET) Detection System (USNDS) provides a near real-time worldwide, highly survivable/endurable capability to detect, locate, and report any nuclear detonations in the earth's atmosphere or in near space. USNDS supports NUDET detection requirements across five mission areas: Integrated Tactical Warning and Attack Assessment (ITW/AA), Nuclear Force Management (NFM), Space Control (SC), Treaty Monitoring (TM), and a classified mission.

The USNDS program is jointly sponsored and funded by the Department of Defense (DoD), through the Air Force (AF), and the Department of Energy (DOE), through the National Nuclear Security Administration (NNSA) and its Nuclear Detonation Detection (NA-22) office, respectively. NNSA/NA-22 supplies USNDS space sensors as Government Furnished Equipment (GFE) to the AF's USNDS Program Office, which is responsible for all acquisition and Systems Engineering, Integration and Test (SEI&T) activities on Space Vehicles (SVs), to include Global Positioning System (GPS) and additional hosts, and their supporting ground control segments. The AF directly funds the development of the USNDS ground segment (described below).

DoD funds their contribution to the USNDS program in Program Element (PE) 1203913F with Research, Development, Test and Evaluation (RDT&E), Space Procurement, Air Force (SPAF), and Operations and Maintenance (O&M).

USNDS consists of space sensors and complex ground segments. The space segment sensors, funded by DOE, consists of three nuclear detection sensor payloads: the Radiation Detection Capability (RADEC) payload for Defense Support Program (DSP) satellites, the Global Burst Detection (GBD) payload for Medium Earth Orbit (MEO) platforms (GPS satellites), and the Space Atmospheric Burst Reporting System (SABRS) payload for Geosynchronous Earth Orbit (GEO) platforms (classified GEO host), and Space Test Platform (STP) 3. Together, these sensors and associated communications capability provided by the host satellites comprise the global NUDET space segment detection capability for the USNDS. Space sensors communicate NUDET indications to the fixed ground segment, the RADEC Data Processor (RDP), and the Integrated Correlation and Display System (ICADS), the five deployable mobile ground segment survivable Ground NDS Terminals (GNTs), and the survivable/endurable Universal Ground NDS Terminals (UGNTs), when fielded. The ground segment provides ground receiving analysis and reporting capabilities to national authorities, commands, and forward users as well as Department of State (DOS) for the Treaty Monitoring and Verification mission. The ground control segment is being modernized and continuously improved through an incremental, evolutionary acquisition approach.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203913F / *NUDET Detection System (SPACE)*

The upgrade to the GNT is the survivable/endurable UGNT which is funded with RDT&E in this PE. The UGNT provides NUDET Detection Reports to end users through survivable/endurable USNDS communications via Milstar/Advanced Extremely High Frequency (AEHF) circuits. The GNT supports ITW/AA and NFM missions. The UGNT program modifies the baseline of the GNT program and deploys as an integral part of the Space Based Infrared System Survivable (SBIRS) / Endurable Evolution (S2E2) Mobile Ground System (SMGS) units also in support of ITW/AA and NFM. The UGNT, when integrated with the SMGS, will perform NUDET event processing with fused NDS data from GPS and DSP. SMGS capability refers to the result of the S2E2 upgrade program for the Mobile Ground System (MGS) mission processing capability, including the integration of UGNT. The intended end state of UGNT integration is delivery of enhanced NUDET detection capabilities which meet survivable/ endurable attack assessment requirements directed by the President, Secretary of Defense (SECDEF), Joint Staff, and USSTRATCOM, delivering long-term, cost effective, multi-role, multi-mission space effects to the war fighter across the range of military operations.

This budget line includes systems engineering, research and development, on-orbit and field testing and end-to-end verification of USNDS space sensors, ground analysis and reporting systems in support of the five USNDS mission areas. Sensor integration for GPS III and GPS IIIF are funded in their respective PEs.

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

This PE may include necessary civilian pay expenses required to manage, execute, and deliver NUDET Detection System (SPACE) weapon system capability. The use of such program funds is in addition to the civilian pay expenses budgeted in PEs 1206392F and 1206398F.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203913F / *NUDET Detection System (SPACE)*

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	31.508	19.778	16.972	0.000	16.972
Current President's Budget	31.304	19.778	49.300	0.000	49.300
Total Adjustments	-0.204	0.000	32.328	0.000	32.328
• Congressional General Reductions	-0.204	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	32.328	0.000	32.328

Change Summary Explanation

FY 2020: +26.498M to fund USNDS 7 Ground System (New Start); +5.830M to fund SBIRS S2E2 Integration Efforts

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Universal Ground NDS Terminals (UGNT)	22.267	3.872	0.000

Description: The five UGNT trailers provide NUDET Detection Reports to end users through survivable/endurable USNDS communications via Milstar/AEHF circuits. The UGNT program modifies the baseline of the GNT program and deploys as an integral part of the SMGS units also in support of ITW/AA and NFM. UGNT delivers NUDET detection capabilities that meet survivable/endurable tactical warning and attack assessment requirements directed by the President, SECDEF, Joint Staff and USSTRATCOM delivering long-term, cost effective, multi-role, multi-mission space effects to the warfighter across the range of military operations.

FY 2019 Plans:

Deliver the fifth UGNT trailer to the SBIRS S2E2 program for integration into the S2E2 Force Package (FPAK). Conduct integration and testing of UGNT vehicles one through four with S2E2. Continue rapid response to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, prototyping, etc. USNDS 6 program is complete after the delivery of the fifth UGNT trailer.

FY 2020 Plans:

N/A

FY 2019 to FY 2020 Increase/Decrease Statement:

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203913F / *NUDET Detection System (SPACE)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY 2020 decreased compared to FY 2019 by $3.872M. Justification for this decrease described in the plans above.			
Title: Systems Engineering/On-Orbit Support & Testing	9.037	2.720	0.000
Description: Support costs included such activities as, on-orbit USNDS sensor integration, check-out/support, testing and system engineering. ***FY 2019 Plans:*** Support launch and checkout of USNDS payloads on GPS III SV01. Continue on-orbit system engineering analysis of the USNDS fleet. Provide Systems Engineering & Integration (SE&I), technical support and program technical support for the five USNDS mission areas. With the introduction of GPS III Contingency Operations (COps) in FY 2019, USNDS on-orbit support will be required for check-out of GPS III satellites already on orbit. USNDS will support Integration activities with the S2E2 SMGT trailers, Systems Engineering/On-Orbit Support & Testing cost after the delivery of the fifth UGNT trailer. ***FY 2020 Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 decrease compared to FY 2019 by $2.720M. Justification for this decrease described in the plans above.			
Title: Integration with SBIRS S2E2 Mobile Ground Terminals (SMGTs) and On-orbit support	0.000	13.186	22.802
Description: Support the Integration and test activities between UGNTs and the S2E2 SMGTs, which together provide NUDET Detection Reports and missile warning data to end users through survivable/endurable USNDS communications via Milstar/AEHF circuits. The UGNTs deploy as an integral part of the SBIRS S2E2 SMGS units also in support of ITW/AA and NFM. Additional support costs includes such activities as, on-orbit NDS sensor integration, check-out/support, testing and system engineering. ***FY 2019 Plans:*** These efforts were previously justified under the project called UGNT and "Systems Engineering/On-Orbit Support & Testing". FY 19 plans include USNDS technical support for the integration efforts between UGNTs and SMGTs. Includes Systems Engineering/ On-Orbit Support and Testing costs after the delivery of the fifth UGNT trailer. ***FY 2020 Plans:*** Perform series of FPAK High Altitude Electromagnetic Pulse (HEMP) tests on second and fifth UGNT. Conduct FPAK training activities. Support FPAK Operation Testing with FPAK unit one, two, and three. Continue to support integration activities with SBIRS S2E2 program. Support launch and checkout of USNDS payloads on GPS III Space Vehicle (SV) 02 and SV 03. Continue			

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203913F / *NUDET Detection System (SPACE)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
on-orbit system engineering analysis of the USNDS fleet. Provide SE&I, technical support and program technical support for the five USNDS mission areas. Continue COps on-orbit support for check-out of all GPS III satellites on orbit. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 increased compared to FY 2019 by $9.616M. Justification for this increase described in the plans above.			
Title: USNDS 7 ***Description:*** USNDS 7 consists of an ICADS 7 satellite ground data processing system and UGNT trailers that accommodate new NDS payload on GPS IIIF family of vehicles and are an upgrade to the current USNDS 6 program. USNDS 7 ICADS reports endoatmospheric, transition and near-space nuclear detonations as detected by the USNDS sensors aboard the GPS satellites, DSP satellites and SABRS equipped satellites. ICADS Build 7 process NDS, State-of-Health (SOH), and navigation data from GPS IIIF. USNDS 7 UGNT provide NUDET Detection Reports to end users through survivable/endurable USNDS communications via Milstar/AEHF circuits. USNDS 7 also consists of the Integrated Data Denial (IDD). IDD is a Communications Security (COMSEC) device associated with the USNDS. IDD provides decryption of satellite position data and NDS sensor data used to detect, locate, and report nuclear detonations in earth's atmosphere or near-space in near real time. This IDD effort contains cryptographic modifications mandated by National Security Agency (NSA). In addition, parts obsolescence requires the start of a new IDD design and manufacturing effort. ***FY 2019 Plans:*** N/A ***FY 2020 Plans:*** Begin USNDS 7 to include, but is not limited to initial design, development of the IDD, new algorithms, and the upgrade of ICADS software and hardware to support the USNDS payload on GPS IIIF. USNDS 7 also includes system engineering, program support, initial test planning, and finalizing requirements. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 increased compared to FY 2019 by $26.498M. Justification for this increase described in the plans above.	0.000	0.000	26.498
Accomplishments/Planned Programs Subtotals	31.304	19.778	49.300

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• SPAF 01 Line Item NUDETS: *Nudet Detection Sys Space*	6.370	7.705	7.432	-	7.432	6.645	6.780	6.907	0.000	Continuing	Continuing

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203913F / *NUDET Detection System (SPACE)*

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost

Remarks

E. Acquisition Strategy

The USNDS Acquisition Strategy is to develop, integrate, field and sustain USNDS satellite sensors and USNDS ground data processing and distribution hardware and software as well as mission operational and technical program support to sustain the USNDS capability on GPS, DSP, and an Alternate Host; funding is sent by Military Interdepartmental Purchase Request (MIPR) from DoD and DOE to Sandia, Lawrence Livermore, Los Alamos National Laboratories and other agencies on existing DOE/NNSA contracts.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203913F / *NUDET Detection System (SPACE)*	Project (Number/Name) 672808 / *Nuc Detonation Det Sys (sensors)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
USNDS ICADS, GNT/ UGNT, and Integration Support	MIPR	Sandia National Laboratory : Albuquerque, NM	-	21.451	Nov 2017	11.451	Nov 2018	12.183	Nov 2019	-		12.183	Continuing	Continuing	-
USNDS Technical Mission Analysis	MIPR	Aerospace : El Segundo, CA	-	1.882	Nov 2017	1.942	Nov 2018	1.932	Dec 2019	-		1.932	Continuing	Continuing	-
USNDS Enterprise SE&I	C/CPAF	TASC : El Segundo, CA	-	1.140	Dec 2017	1.140	Dec 2018	0.869	Dec 2019	-		0.869	Continuing	Continuing	-
USNDS 7	MIPR	Sandia National Labs : Albuquerque, NM	-	-		-		26.498	Nov 2019	-		26.498	Continuing	Continuing	-
		Subtotal	-	24.473		14.533		41.482		-		41.482	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
USNDS Testing	Various	17th Test Squadron, JITC : Schriever AFB, CO	-	0.692	Dec 2017	0.315	Dec 2018	0.130	Dec 2019	-		0.130	Continuing	Continuing	-
USNDS On-orbit Sensor Testing	MIPR	Various : LANL, SNL, NM	-	3.200	Dec 2017	3.100	Dec 2018	3.915	Dec 2019	-		3.915	Continuing	Continuing	-
		Subtotal	-	3.892		3.415		4.045		-		4.045	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
USNDS FFRDC	Various	Aerospace, MITRE : El Segundo, CA	-	0.879	Nov 2017	0.761	Dec 2018	2.344	Dec 2019	-		2.344	Continuing	Continuing	-
USNDS A&AS	Various	Various : Various	-	1.980	Nov 2017	0.989	Nov 2018	1.349	Nov 2019	-		1.349	Continuing	Continuing	-
USNDS Other Support	C/CPAF	Various : Various	-	0.080	Nov 2017	0.080	Nov 2018	0.080	Nov 2019	-		0.080	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203913F / *NUDET Detection System (SPACE)*	Project (Number/Name) 672808 / *Nuc Detonation Det Sys (sensors)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	2.939		1.830		3.773		-		3.773	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	31.304		19.778		49.300		-		49.300	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203913F / *NUDET Detection System (SPACE)*	**Project (Number/Name)** 672808 / *Nuc Detonation Det Sys (sensors)*

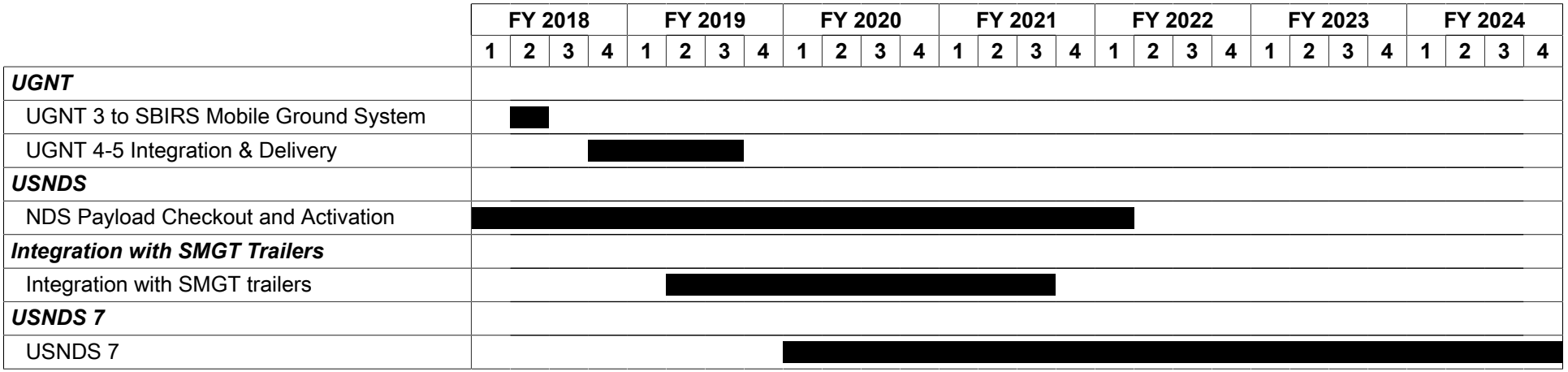

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203913F / *NUDET Detection System (SPACE)*	**Project (Number/Name)** 672808 / *Nuc Detonation Det Sys (sensors)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
UGNT				
UGNT 3 to SBIRS Mobile Ground System	2	2018	2	2018
UGNT 4-5 Integration & Delivery	4	2018	3	2019
USNDS				
NDS Payload Checkout and Activation	1	2018	1	2022
Integration with SMGT Trailers				
Integration with SMGT trailers	2	2019	3	2021
USNDS 7				
USNDS 7	1	2020	4	2024

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 1203940F / *Space Situation Awareness Operations*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	86.173	19.572	17.834	0.000	17.834	30.401	22.950	20.110	20.472	Continuing	Continuing
670004: *Other STRATCOM Activities*	-	57.934	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
67A017: *Sensor Service Life Extension Program*	-	28.239	19.572	17.834	0.000	17.834	30.401	22.950	20.110	20.472	Continuing	Continuing

Note

Beginning in FY 2019, National Space Defense Center (NSDC) funding in PE 1203940F is transferred to PE 1203620F, National Space Defense Center.

A. Mission Description and Budget Item Justification

Space Situational Awareness (SSA) is knowledge of all aspects of space related to operations. As the foundation for space control, SSA encompasses surveillance of all space objects and activities; detailed reconnaissance of specific space assets; monitoring space environmental conditions; monitoring cooperative space assets; gathering intelligence on adversary space operations; and conducting integrated command, control, communications, processing, analysis, dissemination, and archiving activities. SSA also encompasses the integration, exploitation and delivery of data sources to facilitate the battle management and command and control of space forces. This program element fields, upgrades, modifies, modernizes, operationalizes, operates and maintains Air Force sensors and information integration capabilities within the SSA Space Surveillance Network (SSN) while companion program element 1206425F, Space Situational Awareness Systems, develops new network sensors and improved information integration capabilities across the network. Activities funded in this program element (1203940F) focus on surveillance of objects in earth orbit to aid tasks including satellite tracking; space object identification; tracking and cataloging; satellite attack warning; notification of satellite flyovers to U.S. forces; space treaty monitoring; and technical intelligence gathering.

Service Life Extension Programs (SLEPs) (Project 67A017) are efforts to upgrade, operationalize and extend the life of operational SSA sensors, as needed. These SLEPs extend the serviceable life of assets and maintain critical capability by replacing aging and increasingly unsustainable components with modern and sustainable equipment. In addition, the SLEPs themselves may be designed to increase capabilities not currently realized. As the need arises in the execution year, funds in this project may be used to begin SLEPs on additional efforts. These efforts may include prototyping and technology demonstrations.

Global Sensor Watch Program provides an integrated SSA Tip and Cue capability that implements a survivable architecture that provides overlapping, assured, and viable surveillance options for executing event response, multiple level security processing of SSA data and automated cross-sensor tipping and cueing around the globe. Other efforts to support Battle Management Command & Control (BMC2) in space include developing & deploying advanced software algorithms to identify, acquire, characterize, and maintain custody of deep space Super High Interest Objects (SHIO); optimizing intelligence community & Missile Defense Agency sensors to better support BMC2; developing & executing Joint Functional Component Command (JFCC) for Space exercises such as Combined Space Operations Center (CSpOC) Experimentation, Test and Training Initiative (JETTI) to test & optimize Space Control capabilities, concepts of operations (CONOPS) development to increase probability of survival for blue assets, and refining requirements across the space enterprise; enhancing sensor performance to close the solar exclusion

gap by leveraging technologies such as optical daylight tracking; and improving legacy communication paths to support bi-directional machine-to-machine sensor communications enabling a more complete BMC2 capability.

Ground Based Radar Upgrades improves the sensitivity, search capabilities and CONOPS of existing ground-based SSA sensors to better support custody and fire control timelines.

The FY 2020 funding request was reduced by $8.000 million to account for the availability of prior year execution balances.

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

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

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	99.984	19.572	20.314	0.000	20.314
Current President's Budget	86.173	19.572	17.834	0.000	17.834
Total Adjustments	-13.811	0.000	-2.480	0.000	-2.480
• Congressional General Reductions	-0.406	0.000			
• Congressional Directed Reductions	-4.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-8.000	0.000			
• SBIR/STTR Transfer	-1.405	0.000			
• Other Adjustments	0.000	0.000	-2.480	0.000	-2.480

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203940F / *Space Situation Awareness Operations*

Change Summary Explanation

FY 2018: -$4.000M Congressional reduction - excess to need; -$8.000M reprogramming for higher Air Force priorities

FY 2020: +$5.520M increase for completion of Space Surveillance Telescope (SST) testing; -$8.000M reduction to account for availability of prior year execution balances

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203940F / *Space Situation Awareness Operations*	Project (Number/Name) 670004 / *Other STRATCOM Activities*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
670004: *Other STRATCOM Activities*	-	57.934	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The National Space Defense Center (NSDC), formerly the Joint Interagency Combined Space Operations Center (JICSpOC), seeks to improve unity of effort and information sharing across the national security space community to effectively respond to potential future space threat events. The NSDC requires effective battle management, command and control (BMC2) to integrate and synchronize space and cyber forces and the intelligence community with efforts across all domains and to execute unity of effort through the core command and control functions of: situation monitoring, planning, decision making, space force management and space force direction. The NSDC will have the capability to develop, test, and integrate new space system tactics, techniques and procedures (TTPs) in support of both DoD and Intelligence Community (IC) operations. Lessons learned from NSDC experimentation will inform requirements development for future BMC2 architectures.

Beginning in FY 2019, National Space Defense Center (NSDC) funding in PE 1203940F is transferred to PE 1203620F, National Space Defense Center.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: NSDC Infrastructure ***Description:*** Develop and field space battle management, command and control (BMC2) infrastructure. ***FY 2019 Plans:*** N/A ***FY 2020 Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A	25.934	0.000	0.000
Title: SpODC Development ***Description:*** Development of the Space Operations Development Center (SpODC) modeling and simulation infrastructure ***FY 2019 Plans:*** N/A ***FY 2020 Plans:***	32.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203940F / *Space Situation Awareness Operations*	**Project (Number/Name)** 670004 / *Other STRATCOM Activities*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	57.934	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Accelerated Space BMC2 JEON (ST-0006) is led by AFRL and will utilize existing contracts (e.g. Space Security and Defense Program (SSDP)) and provide funds to other AF/DoD organizations to execute on their contracts. Additionally, AFRL will initiate and utilize commercial consortiums to deliver capabilities.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203940F / *Space Situation Awareness Operations*	Project (Number/Name) 670004 / *Other STRATCOM Activities*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SYSTEM ENGINEERING AND INTEGRATION	Various	VARIOUS : COLORADO SPRINGS, CO	-	6.425	Oct 2017	-		-		-		-	Continuing	Continuing	-
SPACE OPERATIONAL DEVELOPMENT CENTER DESIGN AND EXPERIMENTATION	Various	VARIOUS : COLORADO SPRINGS, CO	-	28.590	Oct 2017	-		-		-		-	Continuing	Continuing	-
COMMUNICATIONS ARCHITECTURE DESIGN AND DEVELOPMENT	Various	VARIOUS : COLORADO SPRINGS, CO	-	4.575	Oct 2017	-		-		-		-	Continuing	Continuing	-
APPLICATION DEVELOPMENT	Various	VARIOUS : COLORADO SPRINGS, CO	-	15.344	Oct 2017	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	54.934		-		-		-		-	Continuing	Continuing	N/A

Remarks

FY17 includes $58.8M Request for Additional Appropriations for emergency warfighting readiness requirements.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
A&AS	Various	VARIOUS : COLORADO SPRINGS, CO	-	1.000	Oct 2017	-		-		-		-	Continuing	Continuing	-
FFRDC	SS/FP	MITRE : COLORADO SPRINGS, CO	-	2.000	Oct 2017	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	3.000		-		-		-		-	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203940F / *Space Situation Awareness Operations*	Project (Number/Name) 670004 / *Other STRATCOM Activities*	

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	57.934		0.000		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203940F / *Space Situation Awareness Operations*	**Project (Number/Name)** 670004 / *Other STRATCOM Activities*

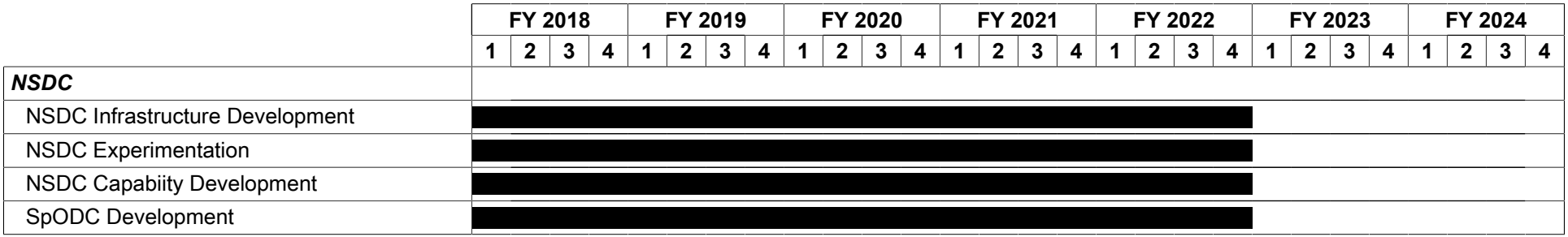

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203940F / *Space Situation Awareness Operations*	**Project (Number/Name)** 670004 / *Other STRATCOM Activities*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
NSDC				
NSDC Infrastructure Development	1	2018	4	2022
NSDC Experimentation	1	2018	4	2022
NSDC Capabiity Development	1	2018	4	2022
SpODC Development	1	2018	4	2022

Note

NSDC efforts transferred to USSPACECOM.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203940F / *Space Situation Awareness Operations*	Project (Number/Name) 67A017 / *Sensor Service Life Extension Program*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
67A017: *Sensor Service Life Extension Program*	-	28.239	19.572	17.834	0.000	17.834	30.401	22.950	20.110	20.472	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Space Situational Awareness (SSA) is knowledge of all aspects of space related to operations. As the foundation for space control, SSA encompasses surveillance of all space objects and activities; detailed reconnaissance of specific space assets; monitoring space environmental conditions; monitoring cooperative space assets; gathering intelligence on adversary space operations; and conducting integrated command, control, communications, processing, analysis, dissemination, and archiving activities. SSA also encompasses the integration, exploitation and delivery of data sources to facilitate the battle management and command and control of space forces. This program element fields, upgrades, modifies, modernizes, operationalizes, operates and maintains Air Force sensors and information integration capabilities within the SSA Space Surveillance Network (SSN) while companion program element 1206425F, Space Situational Awareness Systems, develops new network sensors and improved information integration capabilities across the network. Activities funded in this program element (1203940F) focus on surveillance of objects in earth orbit to aid tasks including satellite tracking; space object identification; tracking and cataloging; satellite attack warning; notification of satellite flyovers to U.S. forces; space treaty monitoring; and technical intelligence gathering.

Service Life Extension Programs (SLEPs) are efforts to upgrade, operationalize and extend the life of operational SSA sensors. These SLEPs extend the serviceable life of assets and maintain critical capability by replacing aging and increasingly unsustainable components with modern and sustainable equipment. In addition, the SLEPs themselves may be designed to increase capabilities not currently realized. As the need arises in the execution year, funds in this project may be used to begin SLEPs on additional efforts. These efforts may include prototyping and technology demonstrations.

Global Sensor Watch Program provides an integrated SSA Tip and Cue capability that implements a survivable architecture that provides overlapping, assured, and viable surveillance options for executing event response, multiple level security processing of SSA data and automated cross-sensor tipping and cueing around the globe. Other efforts to support Battle Management Command & Control (BMC2) in space include developing & deploying advanced software algorithms to identify, acquire, characterize, and maintain custody of deep space Super High Interest Objects (SHIO); optimizing intelligence community & Missile Defense Agency sensors to better support BMC2; developing & executing Joint Functional Component Command (JFCC) for Space exercises such as Combined Space Operations Center (CSpOC) Experimentation, Test and Training Initiative (JETTI) to test & optimize Space Control capabilities, concepts of operations (CONOPS) development to increase probability of survival for blue assets, and refining requirements across the space enterprise; enhancing sensor performance to close the solar exclusion gap by leveraging technologies such as optical daylight tracking; and improving legacy communication paths to support bi-directional machine-to-machine sensor communications enabling a more complete BMC2 capability.

Ground Based Radar Upgrades improves the sensitivity, search capabilities and CONOPS of existing ground-based SSA sensors to better support custody and fire control timelines.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203940F / *Space Situation Awareness Operations*	**Project (Number/Name)** 67A017 / *Sensor Service Life Extension Program*

Programs and projects in the space warfighting enterprise are evaluating ways to maximize innovation, resiliency, and our ability to rapidly respond to known and emerging threats. Space enterprise efforts aim to execute technology risk reduction efforts, integration of new or repurposed capabilities, enterprise decision-making tools, experimentation, and rapid prototyping and fielding via all appropriate acquisition authorities and contract mechanisms.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Global Sensor Watch Program	18.211	19.572	12.314
Description: Global Sensor Watch (GSW) Program provides an integrated SSA Tip and Cue capability that implements a survivable architecture that provides overlapping, assured, and viable surveillance options for executing event response, multiple level security processing of SSA data and automated cross-sensor tipping and cueing around the globe. Other efforts to support Battle Management Command & Control (BMC2) in space include developing & deploying advanced software algorithms to identify, acquire, characterize, and maintain custody of deep space SHIOs; optimizing intelligence community & MDA sensors to better support BMC2; developing & executing JFCC Space exercises such as JETTI to test & optimize Space Control capabilities, CONOPS development to increase probability of survival for blue assets, and refining requirements across space enterprise; enhancing sensor performance to close the solar exclusion gap leveraging technologies and improving legacy communication paths to support bi-directional machine-to-machine sensor communications enabling a more complete BMC2 capability. ***FY 2019 Plans:*** Continue GSW operationalization effort for more situational sensors. Continue program office support and other related support activities that may include, but are not limited to, studies, technical analysis, prototyping, etc. ***FY 2020 Plans:*** GSW Inclusion of Non-Traditional SSA Sensors will have multiple milestones (scrubbed for classification): Concept-C GSW Operationalization (FY 2020), Concept-T GSW Operationalization (FY 2020), Red Dawn GSW Operationalization (FY 2021), Commercial GSW Interface Operationalization (FY 2021), Mission Partner GSW Interface Operationalization (FY 2023). Rapidly respond to and implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to, program office support, studies, technical analysis, experimentation, prototyping, etc. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 decreased compared to FY 2019 by $7.258M. Justification for this decrease is described above.			
Title: Space Surveillance Telescope DT&E/OT&E	0.000	0.000	5.520
Description: Space Surveillance Telescope (SST) provides rapid un-cued search, detection and tracking of dim objects in deep space and offers enhanced capabilities addressing critical space situational awareness gaps. SST is being relocated from White Sands Missile Range, NM to Western Australia in FY 2017 with expected IOC in FY 2021. Efforts include executing SST sensor reassembly, subsystem integration and testing subsequent to Australian facility delays. This includes completion of SST			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203940F / *Space Situation Awareness Operations*	**Project (Number/Name)** 67A017 / *Sensor Service Life Extension Program*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
integration into a new facility, SST subsystem and system testing & Developmental Test/Operational Test and Evaluation (DT/OT&E). ***FY 2019 Plans:*** N/A ***FY 2020 Plans:*** Funds US portion of bill for interruption of SST reassembly, subsystem integration, and testing as a result of Australian facility delays; includes facility integration, SST subsystem and system testing, and DT/OT&E. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 increased compared to FY 2019 by $5.520M. Justification for this increase is described above.			
Title: Ground Radar Upgrades ***Description:*** This effort improves the sensitivity, search capability and CONOPS of existing SSA sensors to better support fire control timelines. ***FY 2019 Plans:*** Continue prototyping L-Band solid-state transmitter, operationalize Ultra High Frequency transmitter/receiver upgrade and field a commercial off the shelf (COTS)-based L-band high voltage power supply. Continue program office support and other related support activities that may include, but are not limited to, studies, technical analysis, prototyping, etc. ***FY 2020 Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A	10.028	0.000	0.000
Accomplishments/Planned Programs Subtotals	28.239	19.572	17.834

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The acquisition strategies for Global Sensor Watch program and Ground Radar Upgrades include a mix of modifications to existing Air Force contracts and directing funds to other AF or DoD organizations for contract support.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203940F / *Space Situation Awareness Operations*	**Project (Number/Name)** 67A017 / *Sensor Service Life Extension Program*

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203940F / *Space Situation Awareness Operations*	**Project (Number/Name)** 67A017 / *Sensor Service Life Extension Program*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GSW Operationalization	C/TBD	Multiple : Colorado Springs, CO	-	10.639	Dec 2017	12.262	Dec 2018	7.624	Dec 2019	-		7.624	Continuing	Continuing	-
GSW SW Development 1	Various	AFRL : Various	-	2.500	Nov 2017	2.500	Nov 2018	1.000	Nov 2019	-		1.000	Continuing	Continuing	-
GSW SW Development 2	Various	MIT/LL : Lexington, MA	-	3.000	Nov 2017	2.500	Nov 2018	1.000	Nov 2019	-		1.000	Continuing	Continuing	-
GSW SW Development 3	Various	Sandia National Labs : Albuquerque, NM	-	0.500	Nov 2017	0.500	Nov 2018	0.500	Nov 2019	-		0.500	Continuing	Continuing	-
Ground Radar Upgrades	Various	Multiple : Colorado Springs, CO	-	8.990	Jul 2018	-		-		-		-	0.000	8.990	-
Space Surveillance Telescope	Various	Multiple : Exmuth Australia	-	-		-		5.520	Oct 2019	-		5.520	Continuing	Continuing	-
		Subtotal	-	25.629		17.762		15.644		-		15.644	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
A&AS	Various	Multiple : Colorado Springs, CO	-	1.250	Oct 2017	0.690	Oct 2018	1.290	Oct 2019	-		1.290	Continuing	Continuing	-
FFRDC	Various	Multiple : Colorado Springs, CO	-	1.200	Dec 2017	1.020	Dec 2018	0.800	Dec 2019	-		0.800	Continuing	Continuing	7.788
Other Support	Various	Muliple : Colorado Springs, CO	-	0.160	Oct 2017	0.100	Oct 2018	0.100	Oct 2019	-		0.100	Continuing	Continuing	16.626
		Subtotal	-	2.610		1.810		2.190		-		2.190	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	28.239		19.572		17.834		-		17.834	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203940F / *Space Situation Awareness Operations*	**Project (Number/Name)** 67A017 / *Sensor Service Life Extension Program*

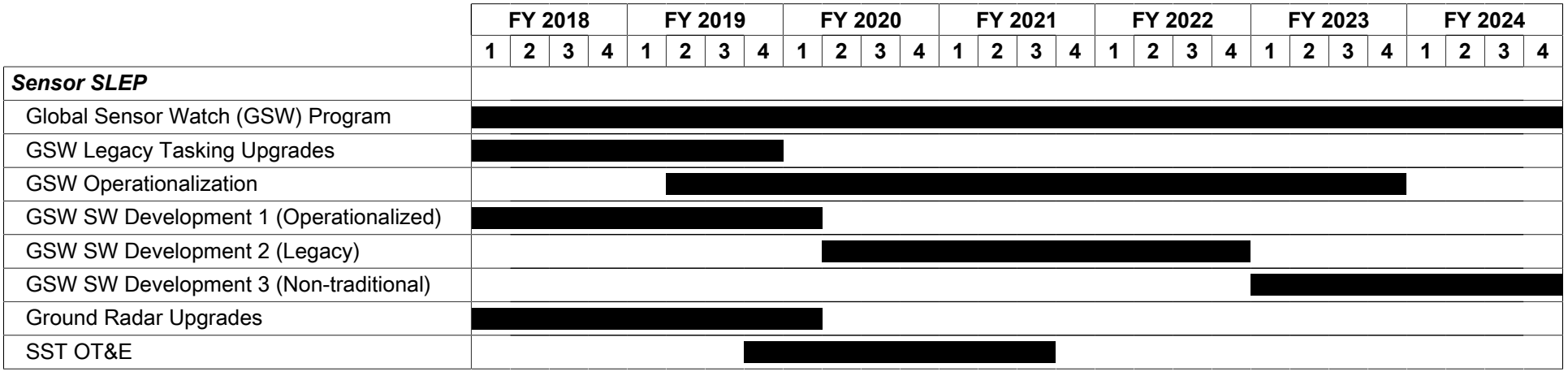

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203940F / *Space Situation Awareness Operations*	**Project (Number/Name)** 67A017 / *Sensor Service Life Extension Program*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Sensor SLEP				
Global Sensor Watch (GSW) Program	1	2018	4	2024
GSW Legacy Tasking Upgrades	1	2018	4	2019
GSW Operationalization	2	2019	4	2023
GSW SW Development 1 (Operationalized)	1	2018	1	2020
GSW SW Development 2 (Legacy)	2	2020	4	2022
GSW SW Development 3 (Non-traditional)	1	2023	4	2024
Ground Radar Upgrades	1	2018	1	2020
SST OT&E	4	2019	3	2021

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 1206423F / *Global Positioning System III - Operational Control Segment*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	3,520.831	492.986	509.258	445.302	0.000	445.302	487.440	406.336	291.066	125.857	0.000	6,279.076
67A021: *OCX*	3,116.549	435.930	445.365	380.342	0.000	380.342	420.635	341.416	291.066	125.857	0.000	5,557.160
67A025: *GPS Enterprise Integrator*	404.282	57.056	63.893	64.960	0.000	64.960	66.805	64.920	0.000	0.000	0.000	721.916
Program MDAP/MAIS Code: 456												

A. Mission Description and Budget Item Justification

The Global Positioning System (GPS) is a space based Positioning, Navigation and Timing (PNT) distribution system which operates through all weather. GPS supports both civil and military users in air, space, sea and land operations. GPS is a satellite-based radio navigation system that serves military and civil users worldwide. GPS users process satellite signals to determine accurate position, velocity and time. GPS must comply with Title 10 United States Code (USC) Sec 2281 which requires that the Secretary of Defense (SECDEF) ensures the continued sustainment and operation of GPS for military and civilian purposes, and 51 USC Sec 50112, which requires that GPS complies with certain standards and facilitates international cooperation.

Program Element (PE) 1206423F funds Research, Development, Test and Evaluation (RDT&E) for the GPS Next Generation Operational Control System (OCX) and the GPS Enterprise Integrator (EI). This includes advanced concept development such as support for Regional Military Protection (RMP), systems analysis, modernized control segment development, modernization/deployment of 17 monitoring stations, mission planning development, training simulators, integrated logistics support products, test resources, systems engineering required to meet the Government's obligations to the international, military and civil communities, and system requirements verification. OCX acquisition was established to 1) provide command and control of legacy and GPS III satellites, 2) incorporate situational awareness to support Navigation Warfare (NAVWAR) and signal monitoring, 3) enable mission capability upgrades to support a warfighter effects-based approach to operations, and 4) integrate Department of Defense (DoD) information assurance and cybersecurity controls and capabilities. GPS EI is responsible for architecture and system definition (the analysis and definition, management, maintenance, and evolution of the GPS Enterprise requirements and interface technical documents) as well as for the planning, execution, and fielding of the GPS Enterprise.

OCX funds support efforts such as engineering studies and analyses, architectural engineering studies, trade studies, technology needs forecasting, modernization initiatives, systems engineering, system development, resolving obsolescence issues, test and evaluation efforts, and mission operations. These activities support upgrades and product improvements for military and civil applications necessary to enable efforts to protect United States (U.S.) Military and Allies' use of GPS. Additionally, funds ensure OCX efforts meet current and future Joint Requirements Oversight Council (JROC) approved required capabilities.

The GPS Enterprise consists of Space, Ground Control, Nuclear Detonation (NUDET) Detection System (NDS) and User Equipment Segments. The Government is responsible for the integration of the GPS Segments such that they provide worldwide GPS capability to support the warfighter and over a billion national security, civil, Allied, and commercial GPS users.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1206423F / *Global Positioning System III - Operational Control Segment*

The GPS EI project includes the efforts associated with the Government's prime contract tasks necessary to accomplish critical integrating function with the three GPS enterprise material segments along with the logistics, operational and transition communities. The GPS EI maintains the GPS current architecture and system definition, controls and validates interfaces, ensures compatibility of Generation II and III systems, and develops/manages plans for execution and fielding of the GPS Enterprise. Further, GPS EI provides modeling, simulation, and technical analyses of impacts for Government directed enterprise level trades among the GPS segments leading to definition, management, maintenance, and evolution of the GPS Enterprise requirements and interface technical documents to build and ensure the integrity of the enterprise technical baseline, and perform system requirements verification.

In addition, the GPS EI project funds the technical evolution, risk reduction, enterprise-level testing and delivery of all GPS Enterprise capabilities. Examples for Generation II include electronic protection; for Generation III, additional anti-jamming protection and additional civil signals. To accomplish this, GPS EI delivers Test and Verification capabilities, Requirements and Interface Management, and Systems Integration support across the Space, Control, and User Segments. In this capacity, GPS EI is responsible for managing this cross-program work to provide these and other capabilities.

GPS EI's analyses guides Government decisions to ensure efficient and effective synchronization and execution across all Generation II and III GPS programs. For Enterprise-wide integration to be successful, the GPS EI: works with the GPS and NDS prime contractor teams to develop plans for early risk reduction System Integration Demonstrations to ensure system interfaces and functionality meet user and system requirements; ensures all equipment and documentation is ready when needed; integrates and analyzes enterprise schedules; and conducts formal test and verification, including Requirement Verification Plans and System Test Plans and Procedures. GPS EI performs all these efforts across all GPS programs in all acquisition phases. The Government owns the GPS Enterprise system requirements and integration, and highly leverages the GPS EI team to eliminate the need to fund a development prime contractor to perform these functions. This enhances Government control, oversight and program accountability.

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

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

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force					Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*			R-1 Program Element (Number/Name) PE 1206423F / *Global Positioning System III - Operational Control Segment*		
B. Program Change Summary ($ in Millions)	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**
Previous President's Budget	510.938	513.235	402.102	0.000	402.102
Current President's Budget	492.986	509.258	445.302	0.000	445.302
Total Adjustments	-17.952	-3.977	43.200	0.000	43.200
• Congressional General Reductions	0.000	-3.977			
• 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	-17.952	0.000			
• Other Adjustments	0.000	0.000	43.200	0.000	43.200

Change Summary Explanation

FY 2020: +$43.200M fund to the June 2018 Independent Cost Estimate (ICE).

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1206423F / *Global Positioning System III - Operational Control Segment*	Project (Number/Name) 67A021 / *OCX*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
67A021: *OCX*	3,116.549	435.930	445.365	380.342	0.000	380.342	420.635	341.416	291.066	125.857	0.000	5,557.160
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

GPS is a space based PNT distribution system which operates through all weather. This project funds the research and development for OCX. This includes, but is not limited to, advanced concept development, systems engineering and analysis, modernized control segment and mission planning development, modernization/ deployment of 17 monitoring stations, training simulators, integrated logistics support products, and test resources.

OCX acquisition was established to: 1) provide command and control of legacy and GPS III satellites; 2) incorporate situational awareness to support NAVWAR and signal monitoring; 3) enable mission capability upgrades to support a warfighter effects-based approach to operations; and 4) integrate DoD information assurance and cybersecurity controls and capabilities. OCX funds will support efforts such as engineering studies and analyses, architectural engineering studies, trade studies, technology needs forecasting, technology development, systems engineering, system development, test and evaluation efforts and mission operations in support of upgrades and product improvements for military and civil applications necessary to support efforts to protect U.S. military and Allies' use of GPS. Additionally, funds will ensure efforts to meet current and future JROC approved required capabilities.

Funding will also support new capabilities being developed by the GPS III Follow-On (GPS IIIF) production program along with RMP. This effort will research potential impacts and develop solutions due to the GPS IIIF modifications, upgrade monitoring stations, and implement advances in collection and integration of RMP high-power regional Military Code (M-Code) signals.

OCX Block 0 (through Iteration 1.5) is the Launch and Control System (LCS) intended to conduct Launch and Early Orbit (LEO) operations and the on-orbit checkout of all GPS III satellites. OCX Block 0 is a subset of OCX Block 1.

OCX Block 1 (adds Iterations 1.6, 1.7 and 2.1 to Block 0) fields the operational capability to control all legacy satellites and civil signals (L1C/A), military signals (L1P(Y), L2P(Y)) as well as the GPS III satellites and the modernized civil signal (L2C) and the aviation safety-of-flight signal (L5). In addition, Block 1 will field the basic operational capability to control the modernized military signals (L1M and L2M M-Code), and the globally compatible signal (L1C). It also fully meets information assurance/cyber defense requirements.

OCX Block 2 fields the advanced operational capability to control the advanced features of the modernized military signals (L1M and L2M M-Code). Blocks 1 & 2 are being delivered concurrently as a result of the Oct 2016 Nunn-McCurdy review.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: OCX Development	411.734	410.435	342.142

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1206423F / *Global Positioning System III - Operational Control Segment*	**Project (Number/Name)** 67A021 / *OCX*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: Development of GPS OCX system to launch GPS III, operate a mixed GPS II and GPS III constellation, and provide for a robust Information Assurance system. ***FY 2019 Plans:*** Continue contractor support of Block 0. Complete Iteration 1.7 and 2.1 software coding and start integration and test activities. Complete 1.7 and 2.1 Security Test and Evaluation activities. Start installation and integration of the monitoring stations equipment and OCX Monitor Station Receiver Equipment (OMSRE). Begin OMSRE Positioning Signal Integrity Continuity Assurance (PSICA) data collecting and Network Interface Module (NIM) tuning. Continue security certification leading to Authorization to Operate (ATO). Continue program office support and other related support activities that may include, but are not limited to studies, technical analysis, prototyping, etc. ***FY 2020 Plans:*** Continue Iteration 1.7 and 2.1 integration and test activities Continue contractor support of the Block 0 baseline that is supporting GPS III satellite launch and checkout. Complete system level Factory Qualification Testing (FQT) and Site Acceptance Testing (SAT). Continue system maturity demonstrations, known as Transition Risk Reduction Operations (TRROs), in support of transition from the legacy Operational Control Segment (OCS) to OCX. Complete OMSRE PSICA data collecting and NIM tuning. Submit ATO packages for the Block 0 and Operational Block 1. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 decreased compared to FY 2019 by $68.293M. Justification for this decrease is described in plans above.			
Title: Technical Support	24.196	34.930	38.200
Description: Development of the Standardized Space Trainer (SST) to provide GPS III operator training. Development of Enterprise Mission Planning Systems. Facilities upgrades for Control Stations and associated equipment and servers. Systems Engineering (SE) including Technical Mission Analysis, Modernization SE and Technical Support, and Test and Evaluation. ***FY 2019 Plans:*** Complete work on the SST and development demonstration of capabilities. Complete installation and integration. Continue data collection, and tuning of the monitoring stations equipment and OMSRE. Complete facility upgrades and testing to include the Master Control Station (MCS), Alternate Master Control Station (AMCS), and remote monitor station sites. ***FY 2020 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1206423F / *Global Positioning System III - Operational Control Segment*	**Project (Number/Name)** 67A021 / *OCX*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Complete work on the SST and development demonstration of capabilities. Complete installation and integration. Continue data collection, and tuning of the monitoring stations equipment and OMSRE. Complete facility upgrades and testing to include the MCS, AMCS, and remote monitor station sites. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 increased compared to FY 2019 by $3.270M. Justification for this increase is described in plans above.			
Accomplishments/Planned Programs Subtotals	435.930	445.365	380.342

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• RDTE 07 PE 1203265F: *GPS III Space Segment*	233.043	141.892	42.440	-	42.440	10.780	7.296	7.451	7.585	26.700	477.187
• RDTE 05 PE 1203269F: *GPS III Follow-On*	-	426.889	462.875	-	462.875	279.423	258.041	294.800	286.368	Continuing	Continuing
• SPAF 01 Line Item GPSIII: *GPS III Space Segment*	84.064	69.386	31.466	-	31.466	20.143	21.320	19.332	19.680	87.300	352.691
• DOT: *DOT (FAA) Civil Funding*	11.400	0.000	0.000	-	0.000	0.000	0.000	0.000	-	0.000	11.400

Remarks

D. Acquisition Strategy

The Air Force is pursuing a "Block" approach for OCX in order to respond to warfighter capability requirements. The strategy calls for capability (e.g., better signal maintainability, Unified S-Band (USB), Search and Rescue (SAR) GPS, and near-real time Command and Control (C2)), on-ramps for the follow-on contract for GPS III Space Vehicles (SVs) (starting no earlier than SV11) which will require updates to the OCX ground segment. Enterprise studies will ensure GPS Enterprise synchronization across space and ground segments.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1206423F / *Global Positioning System III - Operational Control Segment*	**Project (Number/Name)** 67A021 / *OCX*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GPS OCX Phase B OCX Block 1 & 2 Development	C/CPAF	Raytheon : Aurora, CO	2,392.664	388.550	Dec 2017	377.976	Dec 2018	321.639	Dec 2019	-		321.639	1,041.585	4,522.414	4,522.414
GPS OCX Technical Mission Analysis	MIPR	Various : Various	31.614	14.467	Dec 2017	13.909	Dec 2018	15.124	Dec 2019	-		15.124	44.750	119.864	-
GPS OCX Enterprise SE&I	C/CPAF	TASC : El Segundo, CA	53.503	1.429	Dec 2017	6.841	Dec 2018	5.795	Dec 2019	-		5.795	9.087	76.655	76.655
GPS OCX Modernization/ SE & Technical Support	Various	Various : Various	62.921	2.114	Dec 2017	0.800	Dec 2018	2.650	Dec 2019	-		2.650	5.100	73.585	-
GPS OCX AMCS Facility Dev	Various	Various : Various	0.777	0.615	Mar 2018	1.000	Mar 2019	-		-		-	0.000	2.392	-
GPS OCX Standard Space Trainer (SST)	C/CPAF	Sonalyst, Inc : Waterford, CT	16.500	-		6.000	Dec 2018	5.000	Dec 2019	-		5.000	5.000	32.500	32.500
GPS OCX Enterprise Mission Planning	C/CPIF	Booz Allen Hamilton Eng Services : El Segundo, CA	16.300	5.800	Jan 2018	5.800	Jan 2019	5.800	Jan 2020	-		5.800	0.000	33.700	33.700
GPS OCX Phase A Development	Various	Various : Various	289.000	-		-		-		-		-	0.000	289.000	289.000
		Subtotal	2,863.279	412.975		412.326		356.008		-		356.008	1,105.522	5,150.110	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GPS OCX T&E	C/Various	Various : Various	4.672	1.200	Mar 2018	7.421	Mar 2019	9.626	Mar 2020	-		9.626	0.000	22.919	-
		Subtotal	4.672	1.200		7.421		9.626		-		9.626	0.000	22.919	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GPS OCX FFRDC	MIPR	Various : Various	133.502	9.913	Oct 2017	5.730	Oct 2018	4.949	Oct 2019	-		4.949	17.158	171.252	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1206423F / *Global Positioning System III - Operational Control Segment*	**Project (Number/Name)** 67A021 / *OCX*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GPS OCX A&AS	Various	Various : Various	112.419	11.156	Feb 2018	18.948	Feb 2019	7.919	Feb 2020	-		7.919	54.170	204.612	-
GPS OCX Other Support	Various	Various : Various	2.677	0.686	Oct 2017	0.940	Oct 2018	1.840	Oct 2019	-		1.840	2.125	8.268	-
		Subtotal	248.598	21.755		25.618		14.708		-		14.708	73.453	384.132	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	3,116.549	435.930		445.365		380.342		-		380.342	1,178.975	5,557.161	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1206423F / *Global Positioning System III - Operational Control Segment*	**Project (Number/Name)** 67A021 / *OCX*

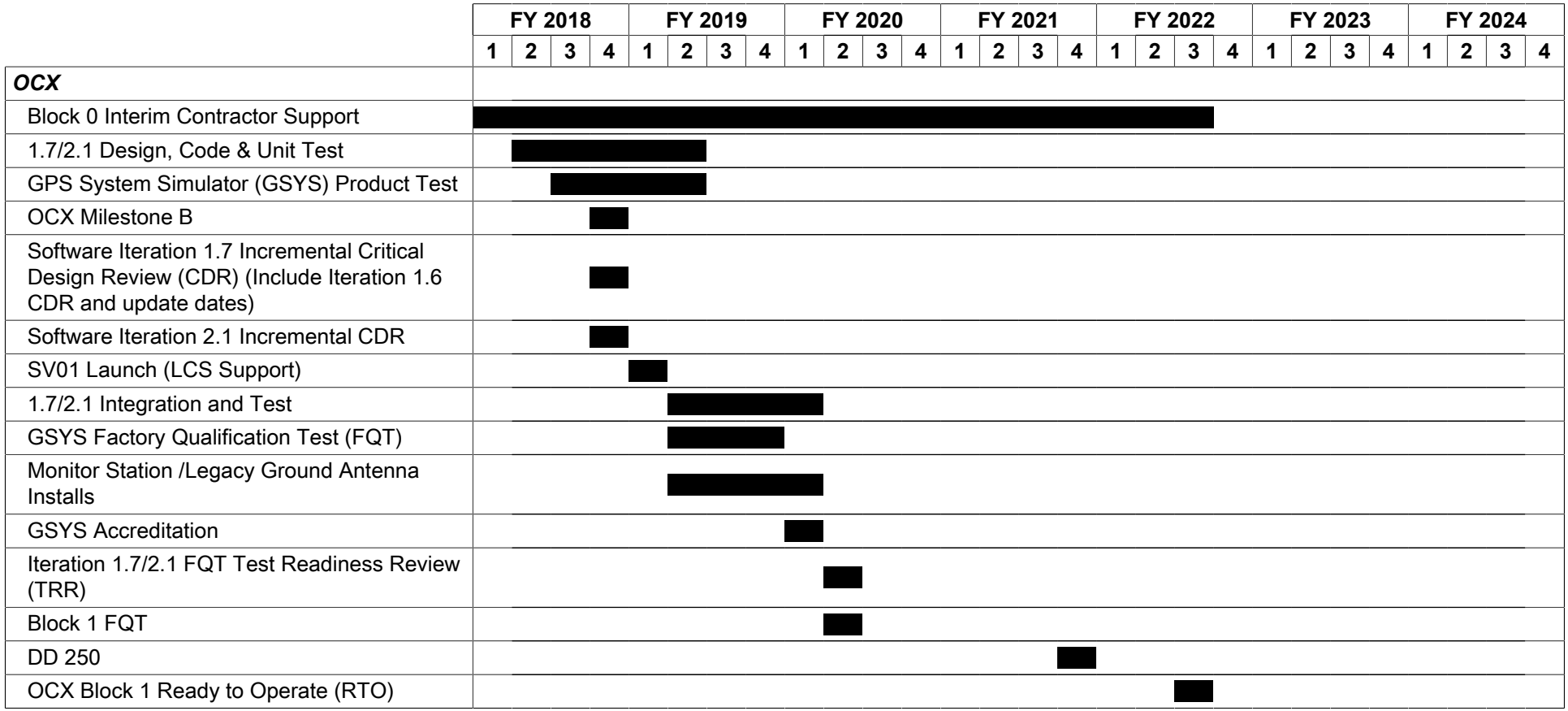

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1206423F / *Global Positioning System III - Operational Control Segment*	**Project (Number/Name)** 67A021 / *OCX*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
OCX				
Block 0 Interim Contractor Support	1	2018	3	2022
1.7/2.1 Design, Code & Unit Test	2	2018	2	2019
GPS System Simulator (GSYS) Product Test	3	2018	2	2019
OCX Milestone B	4	2018	4	2018
Software Iteration 1.7 Incremental Critical Design Review (CDR) (Include Iteration 1.6 CDR and update dates)	4	2018	4	2018
Software Iteration 2.1 Incremental CDR	4	2018	4	2018
SV01 Launch (LCS Support)	1	2019	1	2019
1.7/2.1 Integration and Test	2	2019	1	2020
GSYS Factory Qualification Test (FQT)	2	2019	4	2019
Monitor Station /Legacy Ground Antenna Installs	2	2019	1	2020
GSYS Accreditation	1	2020	1	2020
Iteration 1.7/2.1 FQT Test Readiness Review (TRR)	2	2020	2	2020
Block 1 FQT	2	2020	2	2020
DD 250	4	2021	4	2021
OCX Block 1 Ready to Operate (RTO)	3	2022	3	2022

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1206423F / *Global Positioning System III - Operational Control Segment*	Project (Number/Name) 67A025 / *GPS Enterprise Integrator*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
67A025: *GPS Enterprise Integrator*	404.282	57.056	63.893	64.960	0.000	64.960	66.805	64.920	0.000	0.000	0.000	721.916
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

GPS EI is responsible for technical baseline management, integration, synchronizing, testing, and verifying GPS III, OCX, Military Global Positioning System User Equipment (MGUE), M-Code Early Use (MCEU) and Contingency Operations (COps) programs that constitute the GPS Enterprise. Moreover, GPS EI is responsible for delivering a reliable PNT signal capability to military operators, the civil user community, and international partners. Similarly, the Government Joint Program Office owns and approves the technical baseline and is responsible for the successful fielding of all the GPS Segments (space, control, and user). In order to successfully execute its responsibilities, the Government relies on GPS EI's specific expertise to create an enterprise architecture, integrate segment products, and verify the enterprise requirements are adequately met.

The GPS EI is also responsible for developing and managing the Enterprise technical baseline, which reflects multiple stakeholders' requirements. Such stakeholders include the Department of Defense (DoD), foreign governments, industry, and the general public (through four public interface specifications). Furthermore, GPS EI ensures GPS capabilities meet the warfighter's, civil agencies', commercial entities', international treaties', and over four billion global GPS users' needs. The GPS EI also manages the process through which the JROC validated requirements are matured and flowed down to the system segments, while remaining consistent with various interfaces. This enables the GPS system to meet Title 10 of the USC, Sec 2281, mandated GPS capabilities, and various other obligations to the international community that provide inter-operable PNT signals. GPS EI is also responsible for all aspects of schedule and technical alignment across the segments. Additionally, GPS EI is responsible for creating and managing plans that provide early exercise of the products under development, compatibility analysis, and inter-segment testing. The inter-segment tests are required to prove OCX interoperability with GPS III satellites and modernized user equipment. More importantly, it ensures backwards compatibility with GPS Block II satellites and legacy user equipment.

GPS EI activity supports the Government Joint Program Office's GPS spectrum protection at international forums such as the International Telecommunications Union. Such support consists of advocating on behalf of the United States Government when negotiating with foreign partners. In addition, GPS EI provides technical expertise to maintain relationships with other U.S. government agencies that include the Federal Aviation Administration (FAA), National Geospatial-Intelligence Agency (NGA), National Aeronautics and Space Administration (NASA), Departments of State (DOS), Transportation (DoT), Homeland Security (DHS), and Commerce (DOC).

Spectrum expertise also ensures GPS priority for eight essential spectrum signals, including those required for civil air navigation and safety of life. Spectrum Protection prevents encroachment from commercial or foreign entities, which results in the preservation of warfighter's reliable signal. As a result, military operations and the integrity of the global economic infrastructure are protected. GPS EI also provides the GPS enterprise expertise in System Safety, Enterprise level System Security Engineering covering Acquisition Systems Program Security (i.e., personnel, industrial, operations, information, sensitive compartmented information, communication, and physical), Program Protection, Foreign Disclosure, Public Release reviews, Mission System Certification and Accreditation, and Enterprise Cybersecurity. GPS EI is accountable for the development, execution, and analysis of OCX, cybersecurity, and associated test cases necessary to deliver a secure operational system.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1206423F / *Global Positioning System III - Operational Control Segment*	**Project (Number/Name)** 67A025 / *GPS Enterprise Integrator*

GPS EI supports the Government development and implementation of various Systems Engineering documents, defines the methods of verification, conducts the analyses or tests, and assists the Government in conducting Integrated System Tests. In addition, GPS EI validates the system performance in various mission threat scenarios during its development. GPS EI provides in-depth technical expertise to enhance government control, oversight and program accountability.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: GPS Enterprise Integrator	57.056	63.893	64.960
Description: The integration and technical baseline control of all elements of the GPS system (space/control/user) in support of both military and civil users. Test and verification of integrated system performance in preparation for operational test and evaluation. ***FY 2019 Plans:*** Continue execution of MGUE Developmental Testing (DT) (Integrated System Test 3-3 Phases 2-4). Execute MGUE lead platform tests. Support MGUE Operational Test and Evaluation (OT&E) test planning. Conduct integrated cyber test of the GPS MCS Architecture Evolution Program (AEP) in preparation for fielding of GPS III satellite. Conduct integrated system test of GPS III satellite with the GPS III COps upgrade to AEP (Integrated System Test 2-5) in preparation for OT&E and operational acceptance of GPS III. Conduct M-Code LiveSky tests in preparation for Core M-Code fielding. Support contractor cybersecurity test of OCX Block 1. Continue cybersecurity tests across all GPS segments (space/ control/user). Conduct test planning for Integrated System Test (IST) 2-6 (Core M-Code), IST 3-1 (OCX Block 1 and GPS III) and IST 3-2 (OCX Block 1, satellite constellation, and MGUE). Support launch and on-orbit checkout testing of GPS III SVs 01 and 02. Support planning and execution of test events for SVs 02 and 03. Execute testing for Selective Availability Anti-Spoofing Module (SAASM) Mission Planning System (SMPS) 5.B.3. Test and integrate M-Code monitoring for Early Use integration and Command and Control of M-Code on the existing OCS AEP. Conduct tests and analyses to protect GPS users from interference sources that threaten performance of GPS receivers. Participate in international Global Navigation Satellite System (GNSS) forums to advocate for GPS regulatory and technical interests. Continue program office support and other related support activities that may include, but are not limited to studies, technical analysis, prototyping, etc. ***FY 2020 Plans:*** Conduct integrated system test of Core M-Code capability (Integrated System Test 2-6) in preparation for OT&E and operational acceptance of M-Code Early Use (MCEU). Conduct government security test of OCX Block 1. Continue test planning for IST 3-1 (OCX Block 1 and GPS III) and IST 3-2 (OCX Block 1, satellite constellation, and MGUE). Continue to support MGUE operational test planning. Continue execution of MGUE DT (IST 3-3 Phases 2-4). Continue execution of MGUE lead platform tests in preparation for MGUE OT&E. Conduct M-Code LiveSky tests in support of MGUE field testing. Support launch and on-orbit checkout testing of SVs 03-05. Support planning and execution of test events for SVs 04-05. Execute testing for SMPS 5.C. Support AEP ground antennas and Commercial Off-The-Shelf (COTS) upgrades. Test and integrate M-Code monitoring stations upgrades. Continue cybersecurity tests across all GPS segments (space/control/user). Continue to conduct tests and analyses			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1206423F / *Global Positioning System III - Operational Control Segment*	**Project (Number/Name)** 67A025 / *GPS Enterprise Integrator*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
to protect GPS users from interference sources that threaten performance of GPS receivers. Participate in international GNSS forums to advocate for GPS regulatory and technical interests. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, etc. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 increased compared to FY 2019 by $1.067M. Justification for this increase is described in plans above.			
Accomplishments/Planned Programs Subtotals	57.056	63.893	64.960

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• RDTE 04 PE 1203164F: *NAVSTAR Global Positioning System (User Equipment) (Space)*	321.186	252.834	329.948	-	329.948	160.139	47.178	71.686	116.771	107.755	1,407.497
• RDTE 07 PE 1203265F: *GPS III Space Segment*	233.043	141.892	42.440	-	42.440	10.780	7.296	7.451	7.585	5.900	456.387
• RDTE 05 PE 1203269F: *GPS III Follow-On*	-	426.889	462.875	-	462.875	279.423	258.041	294.800	286.368	Continuing	Continuing
• RDTE 07 PE 1203913F: *NUDET Detection System*	31.304	19.778	49.300	-	49.300	14.162	14.456	14.719	0.000	Continuing	Continuing
• SPAF 01 Line Item GPSIII: *GPS III Space Segment*	63.664	69.386	31.466	-	31.466	20.143	21.320	19.332	19.680	26.400	271.391
• SPAF 01 GPS IIIF SPAF: *GPS IIIF SPAF*	-	-	414.625	-	414.625	628.445	890.355	897.544	962.300	Continuing	Continuing

Remarks

D. Acquisition Strategy

In accordance with a "back to basics" acquisition approach and the exercise of strong oversight of development contractors, the Air Force is required to exercise complete ownership of the architecture, system definition, technical baseline, and integration of the GPS space, ground, and user segments. While this complex inter-segment integration is traditionally performed by a prime contractor under a systems development contract, for GPS, this approach requires the government to be the integrator. To execute this responsibility, the government leverages systems engineering and integration expertise from both Federally Funded Research and Development Center (FFRDC) contractors and a Systems Engineering & Integration (SE&I) contractor. The GPS EI function of the SE&I contractor is currently funded

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
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within this PE. The SE&I effort was originally procured in 2007 through a full and open competition, as was the new follow-on SE&I contract awarded in 2015. The SE&I follow-on strategy builds in year over year cost reductions as requirements stabilize. In FY 2023, the GPS EI budget will transition from PE 1206423F to PE 1203269F.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1206423F / *Global Positioning System III - Operational Control Segment*	**Project (Number/Name)** 67A025 / *GPS Enterprise Integrator*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GPS EI Enterprise SE&I	C/CPAF	TASC : El Segundo, CA	194.598	18.605	Oct 2017	23.198	Oct 2018	24.248	Oct 2019	-		24.248	48.777	309.426	309.426
GPS EI Technical Mission Analysis 1	MIPR	Aerospace : El Segundo, CA	83.555	10.865	Oct 2017	11.592	Oct 2018	11.100	Oct 2019	-		11.100	19.797	136.909	-
GPS EI Technical Mission Analysis 2	RO	MITRE : Various	80.219	11.703	Oct 2017	12.075	Oct 2018	11.827	Oct 2019	-		11.827	22.942	138.766	-
GPS EI MRTA/MSTA	C/CPIF	Draper Labs : Cambridge, MA	7.446	3.436	Dec 2017	4.250	Dec 2018	3.400	Dec 2019	-		3.400	6.800	25.332	25.332
GPS EI Enterprise Mission Planning	C/CPIF	Various : El Segundo, CA	1.320	-		-		-		-		-	0.000	1.320	1.320
GPS EI Cybersecurity	Various	Various : El Segundo, CA	16.158	4.745	Oct 2017	4.982	Oct 2018	6.985	Oct 2019	-		6.985	15.929	48.799	-
GPS EI Additonal Product Development	Various	Various : Various	4.082	1.236	Oct 2017	1.511	Oct 2018	2.200	Oct 2019	-		2.200	6.974	16.003	-
		Subtotal	387.378	50.590		57.608		59.760		-		59.760	121.219	676.555	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
EI Integrated Systems Test	Various	Various : El Segundo, CA	0.294	-		-		-		-		-	0.000	0.294	-
		Subtotal	0.294	-		-		-		-		-	0.000	0.294	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GPS EI FFRDC	Various	Various : El Segundo, CA	0.583	1.000	Oct 2017	0.165	Oct 2018	0.165	Oct 2019	-		0.165	0.250	2.163	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GPS EI A&AS	Various	Various : EI Segundo, CA	14.922	5.100	Oct 2017	5.720	Oct 2018	4.635	Oct 2019	-		4.635	9.456	39.833	-
GPS EI Other Support	Various	Various : Various	1.105	0.366	Oct 2017	0.400	Oct 2018	0.400	Oct 2019	-		0.400	0.800	3.071	-
		Subtotal	16.610	6.466		6.285		5.200		-		5.200	10.506	45.067	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	404.282	57.056		63.893		64.960		-		64.960	131.725	721.916	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1206423F / *Global Positioning System III - Operational Control Segment*	**Project (Number/Name)** 67A025 / *GPS Enterprise Integrator*

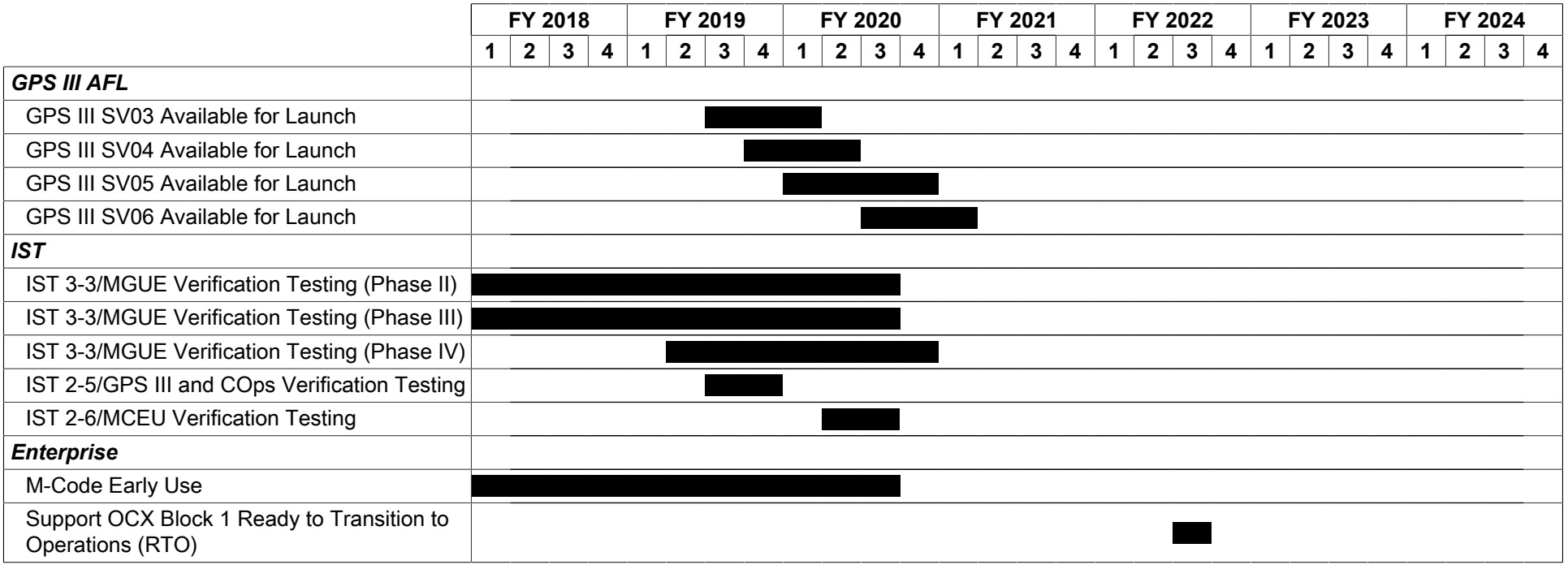

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1206423F / *Global Positioning System III - Operational Control Segment*	**Project (Number/Name)** 67A025 / *GPS Enterprise Integrator*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
GPS III AFL				
GPS III SV03 Available for Launch	3	2019	1	2020
GPS III SV04 Available for Launch	4	2019	2	2020
GPS III SV05 Available for Launch	1	2020	4	2020
GPS III SV06 Available for Launch	3	2020	1	2021
IST				
IST 3-3/MGUE Verification Testing (Phase II)	1	2018	3	2020
IST 3-3/MGUE Verification Testing (Phase III)	1	2018	3	2020
IST 3-3/MGUE Verification Testing (Phase IV)	2	2019	4	2020
IST 2-5/GPS III and COps Verification Testing	3	2019	4	2019
IST 2-6/MCEU Verification Testing	2	2020	3	2020
Enterprise				
M-Code Early Use	1	2018	3	2020
Support OCX Block 1 Ready to Transition to Operations (RTO)	3	2022	3	2022

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 1206770F / *Enterprise Ground Services*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	0.000	0.000	138.870	0.000	138.870	116.830	194.090	165.500	158.320	Continuing	Continuing
673140: *Enterprise Ground Services EGS*	-	0.000	0.000	138.870	0.000	138.870	116.830	194.090	165.500	158.320	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Note: FY 2018-2019 EGS funds are allocated in the Space and Missile Test and Evaluation Center (RDSMO) Program Element (PE) 1203173F and in FY2020+ EGS funds have transferred to a new Program Element (PE) 1206770F, Project 673140, Enterprise Ground Services (EGS).

The Enterprise Ground Services (EGS) program is part of the evolving current and future space domain demands. Multi-Mission Satellite Operations Center (MMSOC) capability will transition to become the EGS command and control (C2) product line. The EGS C2 product line will perform technology maturation, experiments, prototyping and operational mission transition for increased commonality and resiliency in space program ground systems. The EGS capability will become the primary ground C2 system for Air Force Space Enterprise.

The main objective of EGS is to provide a robust enterprise ground architecture for Air Force space systems. EGS will focus efforts on developing and integrating data centers in laboratories at three separate sites, advanced concept exploration, prototype development and demonstrations, user experience maturation, training and Concept of Operations (CONOPS) refinement, cyber operations and operational mission training support. These efforts will require support such as systems engineering, integration and test, standards and interface development, architecture development, enhanced cybersecurity development and implementation. Programs and projects in the space warfighting enterprise are evaluating ways to maximize innovation, resiliency, and our ability to rapidly respond to known and emerging threats. Space enterprise efforts aim to execute technology risk reduction efforts, integration of new or repurposed capabilities, enterprise decision-making tools, experimentation, and rapid prototyping and fielding via all appropriate acquisition authorities and contract mechanisms.

Over the Future Years Defense Program (FYDP) EGS will be developing software applications and other services that support onboarding 23 missions covering the range of mission areas including Missile Warning, Missile Defense, MILSATCOM, Space Domain Awareness and other experimental satellites. The modifications to core software applications provided by EGS will be made in an Agile DevSecOps environment which has and continues to be demonstrated through current EGS activities.

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

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1206770F / *Enterprise Ground Services*

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

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	138.870	0.000	138.870
Total Adjustments	0.000	0.000	138.870	0.000	138.870
• 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	138.870	0.000	138.870

Change Summary Explanation

FY 2020: EGS was transferred from program element 1203173F to 1206770F.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Enterprise Ground Services (EGS) Development	0.000	0.000	67.610
Description: Perform prototype Mission Partner Demonstrations, cybersecurity and crypto development and implementation, standards and interface refining, training and CONOPs refinement, advance concept maturation, integration and test of mission unique software, and integration of common application and services. Expand development environment in order to develop software applications and services in support of onboarding additional satellite missions.			
FY 2019 Plans:			

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1206770F / *Enterprise Ground Services*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
N/A ***FY 2020 Plans:*** Continue maturation of EGS laboratories including providing an enduring initial capability to support DevOps at the Space Management Battle Lab planned at the Catalyst Campus. Continue prototype Mission Partner Demonstrations, cybersecurity and crypto development and implementation, platform development and interface refining, training and CONOPs refinement, advance concept maturation, integration and test of mission unique software, and integration of common applications and services at the distributed Software Integration Lab. Expand User Experience guidelines to include multiple services beyond TT&C, Ground Resource Manager, and Mission Management. Expand EGS core services based on mission needs. Mature EGS deployment automation and testing. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, prototyping, etc. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY2018-2019 Enterprise Ground Services (EGS) funds are allocated in the RDSMO Program Element(PE) 1203173F and in FY2020+ EGS funds have transferred to a new Program Element (PE) 1206770F, Project 673140.			
Title: EGS Pre-Operations (Pre-Ops) Support ***Description:*** Maintain EGS hardware baseline, update software licenses, cyber security, help desk operations, and associated training. ***FY 2019 Plans:*** N/A ***FY 2020 Plans:*** Conduct pre-ops support activities for FY19 satellites EGS to include maintaining EGS hardware baseline, updating software licenses, cyber security, help desk stand up operations, as well as ssociated training. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY2018-2019 Enterprise Ground Services (EGS) funds are allocated in the RDSMO Program Element(PE) 1203173F and in FY2020+ EGS funds have transferred to a new Program Element (PE) 1206770F, Project 673140.	0.000	0.000	35.746
Title: EGS Deployment ***Description:*** Integrate operational EGS data centers with current and future space domain capabilities. Support customer-funded mission onboarding including future mission acquisition planning and risk reduction efforts. ***FY 2019 Plans:***	0.000	0.000	35.514

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1206770F / *Enterprise Ground Services*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
N/A ***FY 2020 Plans:*** Continue the maturation of EGS prototype data centers, networks and links to converge capabilities across the EGS enterprise. Continue integration efforts with current and future space domain capabilities. Build on the FY 2019 deliveries by building out the enclave at BAFB to be identical to the EGS Instances at SAFB and KAFB for resilience. Continue developing the programmatic, technical and architectural roadmap to enable the phased transition of mission partners to EGS. Support customer-funded mission on-boarding including future mission acquisition planning and risk reduction efforts. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2018-2019 Enterprise Ground Services (EGS) funds are allocated in the RDSMO Program Element(PE) 1203173F and in FY2020+ EGS funds have transferred to a new Program Element (PE) 1206770F , Project 673140.			
Accomplishments/Planned Programs Subtotals	0.000	0.000	138.870

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

The EGS acquisition strategy focuses on rapidly delivering C2 prototypes and operational capabilities to warfighters, while leveraging industry best practices for agile development and continuous integration /delivery (CI/CD). One of the key tenets of the EGS acquisition strategy is to maintain government ownership of the technical baseline. As a result, EGS uses a combination of existing and new contracts, and agreements with industry and academia to procure prototypes, platform as a service (PaaS) capabilities, system engineering services, and pre-operations support for mission users. Leverage existing contracts in FY 2019 and continue consolidation of contracts into FY 2020. The intent is to award 2 SBIRS phase 3 contracts in 2nd Qtr FY 2019 to continue this consolidation and to begin scaling of the enterprise to onboard the missions post demonstration activity.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1206770F / *Enterprise Ground Services*	Project (Number/Name) 673140 / *Enterprise Ground Services EGS*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Pre-Ops Support	Various	Various : Various	-	-		-		36.500	Jan 2020	-		36.500	Continuing	Continuing	-
HW, SW and Integration	Various	Various : Various	-	-		-		35.494	Mar 2020	-		35.494	Continuing	Continuing	-
Development	Various	Various : Various	-	-		-		24.604	Oct 2019	-		24.604	Continuing	Continuing	-
Technical Mission Analysis (FFRDC Aerospace Costs)	MIPR	Aerospace : El Segundo, CA	-	-		-		16.957	Oct 2019	-		16.957	Continuing	Continuing	-
Enterprise Systems Engineering and Integration (SE&I)	Various	MITRE : Bedford, MA	-	-		-		16.000	Oct 2019	-		16.000	Continuing	Continuing	-
		Subtotal	-	-		-		129.555		-		129.555	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
A&AS Support	Various	Varioius : Various	-	-		-		8.765	Nov 2019	-		8.765	Continuing	Continuing	-
Other Support	Various	Various : El Segundo, CA	-	-		-		0.550	Dec 2019	-		0.550	Continuing	Continuing	-
		Subtotal	-	-		-		9.315		-		9.315	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		0.000		138.870		-		138.870	Continuing	Continuing	N/A

Remarks

FY2018-2019 Enterprise Ground Services (EGS) funds are allocated in the RDSMO Program Element(PE) 1203173F and in FY2020+ EGS funds have transferred to a new Program Element (PE) 1206770F , Project 673140.

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1206770F / *Enterprise Ground Services*	**Project (Number/Name)** 673140 / *Enterprise Ground Services EGS*

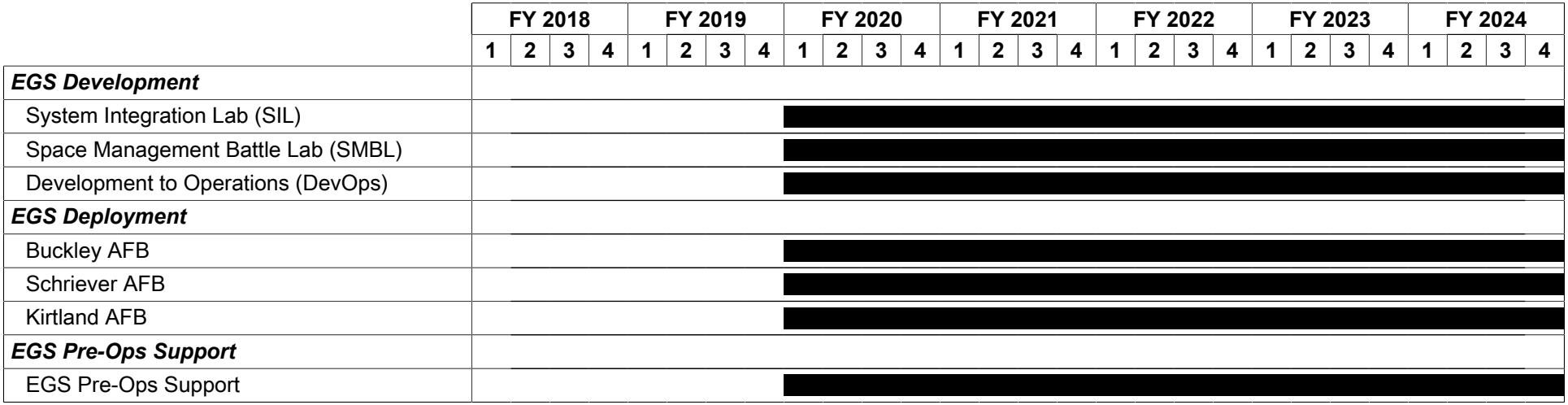

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1206770F / *Enterprise Ground Services*	**Project (Number/Name)** 673140 / *Enterprise Ground Services EGS*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
EGS Development				
System Integration Lab (SIL)	1	2020	4	2024
Space Management Battle Lab (SMBL)	1	2020	4	2024
Development to Operations (DevOps)	1	2020	4	2024
EGS Deployment				
Buckley AFB	1	2020	4	2024
Schriever AFB	1	2020	4	2024
Kirtland AFB	1	2020	4	2024
EGS Pre-Ops Support				
EGS Pre-Ops Support	1	2020	4	2024

Note

The schedule reflects EGS current development plan

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